

Abies bracteata

Abies bracteata (D. Don) Poit. (Santa Lucia fir)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G2 S2.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Abies bracteata is endemic to the Santa Lucia Range of Monterey and northern San Luis Obispo Counties (Griffin 1993, California Native Plant Society 2001). The species is narrowly distributed in an area about 13 miles (21 kilometers) wide by 55 miles (88 kilometers) long on the Los Padres National Forest and a portion of Fort Hunter Liggett. Information on distribution in San Luis Obispo County is difficult to obtain due to private land ownership (Hoover 1970). Talley (1974) produced a coarse-scale map of all known *Abies bracteata* stands. Based on this map, there are an estimated 7,576 acres (3,066 hectares) of Santa Lucia fir forest, 95 percent of which are located on public lands. The Los Padres Forest Plan cites 1,400 acres (577 hectares) of *Abies bracteata* within the Forest boundary (Los Padres National Forest 1988). The discrepancy in acres of *Abies bracteata* habitat are due to different mapping standards being employed and is not due to changes in the actual distribution of the species.

Distribution in the Planning Area

Occurrences of *Abies bracteata* range in elevation from a low point of 600 feet (182 meters) at Big Sur Gorge to the top of Cone Peak at 5,155 feet (1570 meters), with more than half of the species' distribution above 3,200 feet (975 meters). The most extensive stands are in the Ventana Wilderness from Cone Peak north to the headwaters of the Little Sur and Carmel River watersheds. The southernmost stands occur at lower elevations in San Luis Obispo County. Occupied drainages include Marmolejo Creek, Jackson Creek, the Big Sur River, the west and main forks of Limekiln Creek, Hare Canyon, and Villa Creek. *Abies bracteata* is also found along north- and east-flowing drainages including the Carmel River, Miller Fork, Anastasia Canyon, Church Creek, the Arroyo Seco River, the

San Antonio River, the Negro Fork of the Nacimiento River, and San Miguel Creek (Griffin and Critchfield 1972). The number of trees present in these stands is unknown. *Abies bracteata* is also reported from 800 feet elevation in the Arroyo Seco watershed west of Indians, and in the headwaters of Willow Creek.

There are reports of two stands of *Abies bracteata* in the San Carpoforo watershed but the existence of these stands have been challenged (Griffin and Critchfield 1972).

Taxonomy and Natural History

Abies bracteata is a gymnosperm in the pine family (Pinaceae). It is unique among other firs in California in having spine-tipped needles and long, narrow, exerted cone bracts. No other species of fir are found growing with *Abies bracteata* and the nearest fir tree (*Abies concolor*) is probably no closer than 140 miles.

Abies bracteata is an evergreen conifer that can reach more than 100 feet (30 meters) in height and whose cones mature in summer-fall. Based on physical characteristics of the sites it occupies (i.e., rocky areas with low fuel loads), *Abies bracteata* is generally regarded as intolerant of fire, yet some mature stands have survived wildland fires (Stephenson and Calcarone 1999). Talley (1974) examined the fire history of *Abies bracteata* and determined that there were no differences between past and present fire intensities within stands, despite changing fire regimes in California overall.

Many of the seeds produced by *Abies bracteata* are destroyed through predation by a seed chalcid wasp (genus *Megastigmus*). It is not known if seed predation is limiting recruitment of new trees into stands of *Abies bracteata*.

Abies bracteata is shade tolerant, as both a seedling and mature tree.

Habitat Description

Abies bracteata always grows within 13 miles (21 kilometers) of the seacoast. Stands are found along coastal drainages, sometimes adjacent to stands of redwood (*Sequoia sempervirens*). Stands occur in relatively inaccessible areas: on steep north- or east-facing slopes, along ridges, cliff ledges, in canyon bottoms, and on raised stream benches and terraces. *Abies bracteata* may be dominant in stands or co-dominant with canyon live oak (*Quercus chrysolepis*). It usually grows singly or in small groups, but not in continuous forest stands. At lower elevations it occupies the same habitats as coast live oak (*Q. agrifolia*), Pacific madrone (*Arbutus menziesii*), and coast redwood and is almost always in deep shade. At higher elevations it grows with tan oak (*Lithocarpus densiflorus*), interior live oak (*Q. wislizenii*), and incense cedar (*Calocedrus decurrens*) (Stephenson and Calcarone 1999) and may be found in more exposed locations. Other associate tree species include ponderosa, sugar, and Coulter pines (*Pinus ponderosa*, *P. lambertiana*, and *P. coulteri*) and black oak (*Quercus kelloggii*).

Occurrence Status

Amongst fir species of North America (Griffin and Critchfield 1976), *Abies bracteata* has the smallest range and is the least abundant. Despite its highly restricted distribution, *Abies bracteata* is not currently considered to be at risk of extinction (California Native Plant Society 2001). Population trends on National Forest System lands are poorly unknown. A stand of *Abies bracteata* was damaged by the Wild Cattle fire in 1996. Fire damage killed several trees (Painter 2004).

Threats

Abies bracteata has long been recognized as a species at risk due to its narrow distribution and susceptibility to cone parasites. Occurrences of *Abies bracteata* appear stable at this time; however, a recently recognized threat is the invasion of nonnative undesirable species into the understory. The rhizomatous shrub French broom (*Genista monspessulana*) is particularly invasive and difficult to eradicate once established. French broom directly competes with seedlings of Santa Lucia fir (Stephenson and Calcarone 1999).

Because *Abies bracteata* is primarily located in Wilderness and in areas that are generally inaccessible to humans, and because little in the way of livestock management or fuels management occurs in occupied habitat, Forest Service management activities have little or no impact on this species. A current vegetation management project (Los Padres National Forest 2003) within the range of the species is designed to avoid direct fuels treatment in stands of *Abies bracteata* though treatment of fuels to reduce fire hazard will occur in adjoining stands of vegetation. Under this type of management, the risk to individual trees is low and the reduced fire hazard that will exist in adjacent stands of vegetation may benefit *Abies bracteata* by reducing the threat that stand replacing fire events will spread into stands of *Abies bracteata*.

Conservation and Management Considerations

Determine the degree of threat posed by competition from French broom. Determine if the distribution, density, and age structure of *Abies bracteata* is changing over time.

Evaluation of Current Situation and Threats on National Forest System Lands

Abies bracteata is a narrow endemic found only in the Santa Lucia Mountains. Under all alternatives, current and anticipated Forest Service programs and activities are not expected to effect the distribution or abundance of this fir. *Abies bracteata* is found in designated wilderness, a research natural area (Cone Peak RNA), and areas that, under all alternatives, would be in the Back Country Non-motorized land use zone (a small number of trees would be located next to existing road corridors that are in the Back Country land use zone). The suitable uses for these land use zones and designations would not pose a threat to *Abies bracteata*.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Abies bracteata* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Abies bracteata* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

CalFlora: [web application]. 2002. Information on California plants for education, research, and conservation. Berkeley, California: The CalFlora Database [a non-profit organization].

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Abronia nana ssp. covillei

Abronia nana S. Watson ssp. *covillei* (Heimerl) Munz (Colville's dwarf abronia)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4T3T4; S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-1

General Distribution

Abronia nana ssp. *covillei* occurs in Mono, Inyo, and San Bernardino counties in the desert mountains of southern California and southwestern Nevada (CalFlora 2002, Spellenberg 1993). This species is strongly associated with carbonate soils, and possibly carbonate endemic. There are known occurrences on the San Bernardino and Inyo national forests (USDA Forest Service 2002).

Distribution in the Planning Area

Abronia nana ssp. *covillei* is known from twenty occurrences on the San Bernardino National Forest (USDA Forest Service 2002); however, some of these are very close to each other and may be consolidated once they are entered into the California Natural Diversity Database. Occurrences on the SBNF include the north shore of Big Bear Lake between Fawnskin and Big Bear City, Van Dusen Canyon north of the Pacific Crest Trail, Rattlesnake Canyon, near Tip Top Mountain, north of Horsethief Flat, and northeast slope of Sugarloaf Mountain (between Sugarlump and Sugarloaf Mountain (USDA Forest Service 2002).

Taxonomy and Natural History

Abronia nana ssp. *covillei* is a dicotyledonous plant in the four o'clock family (Nyctaginaceae). It is the only subspecies of *A. nana* that occurs in California. *Abronia nana* ssp. *covillei* is an herb that blooms May-August (California Native Plant Society 2001).

Abronia nana ssp. *covillei* is a perennial, densely tufted plant with stems under 6 cm. The leaves are glaucous and have 1-4 cm petioles and 5-20 mm blades that are ovate to more or less round. The inflorescence is scapose and characterized by a peduncle less than 10 cm and bracts 6-8 mm that are lanceolate; with more than 6 flowers. The perianth is white with an 11-15 mm tube and a limb 6-8 mm wide. Fruits are 7-8 mm with 5 thin wings rounded at the top. Plants from the eastern Mojave Desert have wider bracts and longer flowers, approaching ssp. *nana* (Spellenberg 1993).

Habitat Description

Abronia nana ssp. *covillei* is found growing in sub-alpine mixed coniferous forest, pinyon-juniper and Joshua tree woodlands, dry conifer forests, and Great Basin scrub at elevations of 5,000-9,400 feet (1,524-2,865 meters). The plants are usually found on dry slopes or flats, on sandy soils often of carbonate origin (California Native Plant Society 2001; USDA Forest Service 2002). On the SBNF, *Abronia nana* ssp. *covillei* occupies carbonate and mixed carbonate/granite substrates. It has been found in association with *Physaria kingii* ssp. *bernardina*, *Eriogonum ovalifolium* var. *vineum*, *Acanthoscyphus parishii* ssp. *cienegeensis*, *Acanthoscyphus parishii* ssp. *goodmaniana*, *Eriogonum microthecum* var. *corymbosoides*, *Arabis shockleyi*, *Dudleya abramsii*, and *Hulsea vestita* ssp. *parryi*.

Carbonate habitat is fairly widespread on the SBNF; however, many areas are under mining claims and are threatened by mining.

Occurrence Status

Many of the occurrences listed below were discovered during carbonate vegetation plot surveys. None of the occurrences have been monitored, so population trends are unknown.

The following table shows the recorded occurrences in/near the southern California National Forests, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Abronia nana* ssp. *covillei* (Coville's dwarf abronia)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
*	35	2001	ca. 2 air mi. NNE of Hitchcock Spring. Fawnskin Quad. Carbonate substrate. SBNF	SBD
*	3	2001	White Mountain. Butler Peak Quad. Found with <i>Oxytheca parishii</i> var. <i>goodmaniana</i> . Carbonate substrate. SBNF.	SBD
*	27	2001	South Peak White Mountain. Carbonate substrate. Butler Peak Quad. SBNF.	SBD
*	2	2001	Immediately west of the junction of Van Dusen Canyon Rd. and the PCT. SBNF.	SBD
*	< 5	1998	Onyx Peak Quad. ca. 0.5 mi. SE Rose Mine. With <i>Oxytheca parishii</i> var. <i>goodmaniana</i> and <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . SBNF.	SBD
*	> 5	1998	ca. 1.5 mi. ESE from summit of Mineral Mtn. Onyx Peak Quad. SBNF.	SBD
*	< 5	1998	SBNF/Mitsubishi Cement Corp. Moderately steep limestone cobbly slope above trail to Furnace Canyon. Site very open, moderate vegetation cover. Aspect 240 °, slope 45%. With <i>Eriogonum ovalifolium</i> ssp. <i>vineum</i> , <i>Arabis shockleyi</i> , <i>Dudleya abramsii</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . SBNF.	SBD
	260, +30 on		Big Bear Lake. S side of Alpine Pedal Path of the E and W sides of the East Boat Launch Parking Lot. Area dominated by <i>Artemisia tridentata</i> . Plants present in bare areas with <i>Lupinus</i> sp., <i>Erodium cicutarium</i> ,	

*	N side of Hwy 38	2000	<i>Calyptridium pygmaeum</i> , <i>Bouteloua gracilis</i> , <i>Chrysothamnus nauseosus</i> . This population extended to the north side of the highway at the Woodland Trail trailhead and parking lot area. Recent construction to expand the parking area will eliminate part of the population (approximately 30 individuals). SBNF.	SBD
*	20	1998	ca. 0.75 mi. NW of Squirrel Spring. Big Bear City Quad. Occurs with <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . SBNF.	SBD
*	> 5	1998	ca. 1.25 mi. E of Sugarlump. Steep slope grading to upper ridge shoulder. Open rocky slope. Aspect 331 °, slope 31%. With <i>Lesquerella kingii</i> ssp. <i>bernardina</i> , <i>Senecio ionophyllus</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . SBNF.	SBD
*	> 5	1998	ca. 0.5 mi. S of Terrace Springs. Big Bear City Quad. Occurs with <i>Astragalus albens</i> , <i>Oxytheca parishii</i> ssp. <i>goodmaniana</i> , <i>Hulsea vestita</i> ssp. <i>parryi</i> . SBNF.	SBD
*	> 5	1998	ca. 0.5 mi. SE of junction of 2N83Y and 3N03. With <i>Eriogonum ovalifolium</i> ssp. <i>vineum</i> , <i>Arabis shockleyi</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . Slope 50%, aspect 10 °. SBNF.	SBD
*	U	1998	Just SE of previous occurrence. SBNF.	SBD
*	< 5	1998	w/in 0.25 mi. of previous occurrence. SBNF.	SBD
*	> 5	1998	Round Valley. Bottom of rocky slope near road. With <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Arabis shockleyi</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . Aspect 150 °, slope 30%. SBNF.	SBD
*	2 sites, each with < 5	1998	Tip Top Mountain, W-facing slope near ridgetop. With <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> var. <i>cienezensis</i> , <i>Arabis shockleyi</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . SBNF.	SBD
*	U	1998	ca. 0.5 mi. E of Sugarlump. Gentle upper shoulder slope. With <i>Lesquerella kingii</i> ssp. <i>bernardina</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . Aspect 290 °, slope 15%. SBNF.	SBD
*	< 5	1998	< 0.5 mi. NW of Tip Top Mountain Peak. W-facing slope above gully. With <i>Oxytheca parishii</i> ssp. <i>cienezensis</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . Aspect 275 °, slope 18%. SBNF.	SBD
*	< 5	1998	ca. 0.5 mi. ESE Mineral Mtn. Onyx Peak Quad. Bench on steep slope above N drainage. Limestone colluvium with granite bedrock. With <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> ssp. <i>cienezensis</i> , <i>Arabis shockleyi</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . Aspect 120 °, slope 35%. SBNF.	SBD
*	> 5	1998	ca. 0.5 mi. SE of Rose Mine. Toe slope just above major wash. Occurs with <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Aspect 180 °, slope 12%. SBNF.	SBD
	Roughly		Along N. slope of Sugarloaf Ridge from Sugarlump E. to	

*	16,363 individuals	2004	unknown peak elev. 9123 ft. USDAFS.	SBD
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- *U* = Unknown
- * = an occurrence number has not been assigned
- SBNF = San Bernardino National Forest
- SBD = San Bernardino County

Threats

Abronia nana ssp. *covillei* is threatened on National Forest System lands due to ground disturbance and loss of habitat from limestone mining operations and recreation use, particularly from vehicle use off of classified roads (USDA Forest Service 2002; California Native Plant Society 2001).

Conservation and Management Considerations

The primary strategy for the conservation of this species is to implement the CHMS, and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for *Abronia nana* ssp. *covillei*:

- Implement the Carbonate Habitat Management Strategy.
- Survey all new occurrences of *Abronia nana* ssp. *covillei* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Abronia nana* ssp. *covillei* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Abronia nana* ssp. *covillei* in the planning area using NRIS data collection standards, and incorporate these occurrences into the SBNF Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Abronia nana ssp. *covillei* is narrowly distributed and uncommon throughout southern California. While this species is recorded from about 20 localities, suitable habitat is distributed across the carbonate areas of the SBNF, and it is likely that the species is patchily distributed throughout this area. While some of the recorded occurrences are vulnerable to identified threats, others are remote and inaccessible to vehicle impacts. Much of the suitable habitat distributed across the carbonate areas of the forest are also not vulnerable to vehicle impacts. Mining impacts will be addressed at the project level, and will be guided by provisions of the Carbonate Habitat Management Strategy.

Based on this analysis, *Abronia nana* ssp. *covillei* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Abronia nana ssp. *covillei* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Abronia nana* ssp. *covillei* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Abronia nana* ssp. *covillei* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

CalFlora: Information on California plants for education, research and conservation. [web application]. 2002. Berkeley, California: The CalFlora Database [a non-profit organization]. [Accessed: November 2002]

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USDA Forest Service. 2003. "Records on file" at the Big Bear Ranger Station, San Bernardino National Forest.

Abies bracteata

Abronia villosa var. aurita

Abronia villosa var. aurita

Abronia villosa S. Watson var. *aurita* (Abrams) Jepson (Chaparral sand verbena)

Management Status

Federal: None

California: None

Heritage Rank: G5T3; S3.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-3-3

General Distribution

Abronia villosa var. *aurita* occurs in Riverside, San Diego, Imperial, and Orange counties in southern California. Most occurrences of the taxon are located in and around the San Jacinto Mountains. Some occurrences are as far south as Calexico in Imperial County, as far west as Anaheim in Orange County, and north to Corona and San Jacinto Peak in Riverside County. Other occurrences in Riverside County include Coachella, Anza, Hemet, Palm Springs, Whitewater Canyon, Temecula, Winchester, and Temescal Canyon. Records from San Diego County include Anza Borrego State Park and the Santa Margarita River. With the exception of a Lake Elsinore occurrence, all records of *Abronia villosa* var. *aurita* in Orange County (including Anaheim, Atwood, and the Santa Ana River) are presumed extirpated (California Natural Diversity Database 2004).

Distribution in the Planning Area

Two occurrences of *Abronia villosa* var. *aurita* are known on the San Jacinto Ranger District of the San Bernardino National Forest (SBNF). One of these occurrences (occ.9) is near Hemet Lake adjacent to a road, although the exact location is unknown. The other occurrence (occ. 8) was recorded adjacent to a road on the north side of Hemet Valley in the San Jacinto Mountains (California Natural Diversity Database 2004). More information is also needed for this occurrence.

Several occurrences of *Abronia villosa* var. *aurita* are in close proximity to the San Jacinto Ranger District SBNF boundary. These include occ.10 at Valle Vista, occ.12 at the base of San Jacinto Peak near Palm Springs, occ.6 three miles east of Anza, and others. However, most California Natural Diversity Database records for occurrences of *Abronia villosa* var. *aurita* do not include land ownership

information or specific locations of occurrences. It is possible that some of these vaguely-described occurrences may fall within the SBNF boundary, and surveys are needed in these areas to confirm presence or absence on Forest system lands. Occurrences in the Santa Ana Mountains may be on the Cleveland National Forest.

Taxonomy and Natural History

Abronia villosa var. *aurita* is a glandular-hairy annual in the four o' clock family (*Nyctaginaceae*). The stem is prostrate to ascending and generally less than 80 cm long. Leaf petioles are 0.5-5 cm long. The blade is 1-5 cm long, 1-4.5 cm wide and triangular-ovate to more or less round. The inflorescence has a peduncle that is 2-10 cm long, with lanceolate to narrowly ovate bracts that are 3-11 mm long. The inflorescence usually contains 15-35 flowers, each of which has a pink perianth tube that is 2-3.5 cm long and a pale to bright magenta limb that is greater than 1.5 cm wide. The fruit is 5-10 mm long with a nearly smooth body and 3-5 wide wings that extend well above the body (Spellenberg 1993) Flowering occurs March through August (Munz 1974).

Habitat Description

Abronia villosa var. *aurita* requires sandy soil. This taxon occurs between 80 m and 1600 m on sandy desert slopes, in sandy alluvial sediments near streams and rivers, on roadsides in sandy soil, and in loose soil in open pine forests (California Natural Diversity Database 2002). Most occurrences are found on gentle or flat terrain and are associated with chaparral and coastal scrub plant communities.

Chaparral is distributed along the eastern and southeastern margin of the San Jacinto Ranger District of the SBNF. The main threat to chaparral habitat on the SBNF is an altered fire regime that results in infrequent catastrophic fires within the habitat, rather than frequent localized fires. Non-native species encroachment is also a threat to habitat on the SBNF.

Occurrence Status

Thirty occurrences of *Abronia villosa* var. *aurita* are recorded in the California Natural Diversity Database (2002). Very little information is known about any of the occurrences, and several are historic records that have not been relocated since their original collection. Surveys need to be completed throughout the taxon's range to determine the current number and range of extant occurrences.

Although population or trend information is scarce for all occurrences of *Abronia villosa* var. *aurita*, there is an apparent decline across the range of the taxon. Five of the six occurrences in Orange County are extirpated (occs. 24, 27, 28, 29, 30), presumably by urban development. One occurrence near the town of San Jacinto may be extirpated (occ.14); its described location is currently in an urban area.

The following table shows the recorded occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Abronia villosa* var. *aurita* (chaparral sand verbena)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
4	U	U/1999	Original collection date unknown. Reported by A. Sanders to CNDDDB in 1999. Vail Lake, near Wilson Creek. Needs fieldwork. U	RIV
6	U	U	3 mi. E of Anza along Road 371. Location of collection uncertain. Needs fieldwork. U	RIV
7	U	1901	San Jacinto Mountains, Thomas Valley (now called Garner/Hemet Valley). Exact location unknown. Type (<i>A. pinetorum</i>). U	RIV
8	U	1962	San Jacinto Mountains, N side of Hemet Valley. Mapped along roadside according to lat/long cited by source. Need more info. SBNF	RIV
9	U	1935	Hemet Lake, by road. Exact location unknown. Needs fieldwork. SBNF	RIV
10	U	U/1999	Original collection date unknown. Reported by A. Sanders to CNDDDB in 1999. Near Valle Vista, San Jacinto River Wash, 1.7 mi. W of Cranston Fire Station along road by CNDDDB, S ½ sec.11. Needs fieldwork. U	RIV

11	U	1935	Hemet, Hwy 74. Includes 1 other collection cited in SAN99U01 from "E of Hemet". Needs fieldwork. U	RIV
12	U	1913	Base of San Jacinto Mountain, Palm Springs, Agua Caliente. Type location. Includes one other collection from 1913 by Eastwood from Palm Springs. U	RIV
13	U	U/1999	Original collection date unknown. Reported by A. Sanders to CNDDDB in 1999. 2 mi. E of San Jacinto, along the San Jacinto River. Needs fieldwork. U	RIV
14	U	U/1999	Possibly extirpated. Original collection date unknown. Reported by A. Sanders to CNDDDB in 1999. San Jacinto, Los Banos, and Main. Includes 2 other collections: from 1890 by Gregory and by Jepson cited in JEP09B01. U	RIV
15	U	1954	Mouth of Whitewater Canyon. Needs fieldwork. U	RIV
16	U	U/1999	Original collection date unknown. Reported by A. Sanders to CNDDDB in 1999. Pechanga Indian Reservation, 1241'. Mapped along Pechanga Creek. Needs fieldwork. Location information is vague. Pechanga Indian Reservation	RIV

17	U	U/1999	Original collection date unknown. Reported by A. Sanders to CNDDDB in 1999. Pechanga Creeks. Mapped at 1150'. Needs fieldwork. U	RIV
18	U	U/1999	Original collection date unknown. Reported by A. Sanders to CNDDDB in 1999. Temecula, Murrieta Creek. Needs fieldwork. U	RIV
19	U	1964	2.5 mi. SSW of Temecula, Santa Margarita River Canyon. Mapped on Santa Margarita River. Needs fieldwork. U	RIV
20	U	1947	Santa Margarita River Ford N of Fallbrook. Needs fieldwork. U	SD
22	U	1931	Lake Elsinore region. Needs fieldwork, location information is vague. U	OR, RIV
23	U	1957	Temescal Canyon; Temescal Wash below Lees Lake. 2 mi. N of Alberhill. Includes 1 other collection cited in SAN99U01. U	RIV
24	U	1932	Extirpated. Santa Ana River, 1.5 to 2 mi. from ocean. 2 collections mapped together. U	OR
25	U	U/1999	Original collection date unknown. Reported by A. Sanders to CNDDDB in 1999. Temescal Wash near Estelle Mountain, sec.1. Needs fieldwork. U	RIV

- *U = Unknown*

- SBNF = San Bernardino National Forest
- SD = San Diego County
- OR = Orange County
- RIV = Riverside County

Threats

The two occurrences on the San Jacinto Ranger District are threatened by nonnative species establishment and an altered fire regime that has resulted in unnaturally infrequent and catastrophic fires. Occurrences off of Forest system lands are primarily threatened by urban and residential development, road maintenance and altered flood regimes. The five extirpated occurrences were all impacted by altered flood regimes and herbicide application (California Natural Diversity Database 2004).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Abronia villosa* var. *aurita*:

- Survey all new occurrences of *Abronia villosa* var. *aurita* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Abronia villosa* var. *aurita* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Abronia villosa* var. *aurita* in the Province using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Abronia villosa var. *aurita* is uncommon throughout its range. It is restricted to sandy soils in desert scrub, chaparral and coastal sage communities. The primary threat on Forest lands is from fire suppression activities and invasive species.

Based on this analysis, *Abronia villosa* var. *aurita* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Abronia villosa* var. *aurita* would remain distributed across its current geographic range on National Forest System lands

under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Abronia villosa* var. *aurita* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Abronia nana ssp. covillei

Acanthomintha ilicifolia

Acanthomintha ilicifolia

Acanthomintha ilicifolia (A. Gray) A. Gray (San Diego thornmint)

Management Status

Federal: Threatened (63 FR 54937, 13 October 1998)

California: Endangered (California Natural Diversity Database)

Heritage Rank: G1, S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-3-2

There is no Critical Habitat designated for this species.

General Distribution

Acanthomintha ilicifolia, San Diego thornmint, is endemic to mesa and foothill areas of southwestern San Diego County and northern Baja California, Mexico (California Native Plant Society 2001).

Distribution in the Planning Area

Within the National Forest System lands in southern California, *Acanthomintha ilicifolia* is only found on the Cleveland National Forest (CNF). There are four occurrences of *Acanthomintha ilicifolia* on Viejas Mountain and two occurrences on Poser Mountain, all within the Descanso Ranger District (California Natural Diversity Database 2002). These occurrences represent the eastern peripheral extension of the species' range.

Taxonomy and Natural History

Acanthomintha ilicifolia is a dicot in the mint family (Lamiaceae). It is the southernmost member of its genus, and it is distinguished from other species of *Acanthomintha* by having sterile upper stamens (Jokerst 1993). This species is a small annual mint about 5-15 dm high with pink to purple and white flowers. Plants are distinctive with broadly orbicular bracts, having callus margins armed with 7-9 long slender widely spreading spines. These spiny bracts are located just below the flower heads. *Acanthomintha ilicifolia* is a low single-stemmed or branched annual (Jokerst 1993). Plants

flower from April through June and set seed in July (California Native Plant Society 2001). Skeletonized thorny bracts from the last year's growth are often visible outside of the normal growing season.

Acanthomintha ilicifolia reproduces from seed. Seed bank abundance and viable dormancy periods are unknown. However, population numbers fluctuate from year to year dependent on environmental conditions such as annual precipitation, indicating that seeds can remain dormant and viable for several years.

Habitat Description

All members of genus *Acanthomintha* have restricted geographic ranges with narrow habitat requirements (Jokerst 1991). *Acanthomintha ilicifolia* occurs in chaparral, coastal sage scrub, grasslands and vernal pools below 3,060 feet (932 meters) (California Native Plant Society 2001). The species is highly specific to mesas and slopes with clay soils (Las Posas soil series), which are considered a rare habitat type in San Diego County (USDA Forest Service 1991). In addition, *Acanthomintha ilicifolia* is frequently associated with gabbro soils, which are derived from intrusive igneous rock. Plants often occur on gentle slopes of less than 15 to 20 degrees (California Department of Fish and Game 1994). In the Cleveland NF occurrences, *A. ilicifolia* typically occurs with other native species, several of which are uncommon, including chocolate lily (*Fritillaria biflora*) and Palmer's grappling-hook (*Harpagonella palmeri*) (USDA Forest Service 1991).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 72 occurrences of *Acanthomintha ilicifolia* (California Natural Diversity Database 2004). Seven occurrences are extirpated, ten are presumed extirpated, and seven are old, unconfirmed sightings. Six of the recorded extant occurrences are located on the Cleveland NF, comprising about 12% of the known extant populations. The remaining occurrences are on other federal, local agency, The Nature Conservancy, or private lands, with the majority occurring on private lands. Population sizes vary from 25 individuals on private lands in San Marcos (CNDDDB Occ. No. 17) to 60,000 individuals on private lands near San Vicente Reservoir (CNDDDB Occ. No. 64). Because *A. ilicifolia* is an annual, reproducing from seed, population numbers will vary from each year depending in annual precipitation and other climate conditions.

OCCURRENCE DATA of *Acanthomintha ilicifolia* (San Diego Thornmint) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County

12	2-1	20a	2001	Poser Mountain / CNF	SD
12	2-2	2000+ 2600 4152	2001 1994 1991	Poser Mountain / CNF	SD
51	2-3	3500	1994	Viejas Mountain / CNF	SD
		1000	1991		
50	2-4	5600	1994	Viejas Mountain / CNF	SD
		4000	1991		
62	2-5	5000	1992	Viejas Mountain / CNF	SD
74	2-6	2000	2000	Poser Mountain / CNF	SD
75	2-7	70	2001	Viejas Mountain / CNF	SD

a Entirety of CNDDDB Occurrence # 12 was not visited and counted

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *CNF = Cleveland National Forest*
- *SD = San Diego County*

Threats

Populations of *A. ilicifolia* on private lands are threatened by development and nonnative species invasions. Other populations are protected from development on federal lands, The Nature Conservancy properties (McGinty Mountain), and in other open space reserves in San Diego County. The six known occurrences on the Cleveland National Forest occur on Viejas and Poser Mountain and comprise about

12 percent of the known extant occurrences throughout its range.

Viejas Mountain

Viejas Mountain site is a proposed Research Natural Area that has been managed to the greatest extent possible as if it were in an established RNA. This urban mountain is surrounded by several low density housing developments and the Viejas Indian Reservation. Effects from these pressures are the main threats at this location.

There are four occurrences on Viejas Mountain. Three of these occur in secluded locations receiving few visitors. The short section of Anderson Road managed under special use permit, is present on the west side of the mountain in non-occupied habitat. Invasive nonnative plants are present but are mostly confined to the road edge.

In general, the steep and rugged access trails on Viejas Mountain are infrequently used by hikers in spite of the listing in the hiker's guide *Afoot and Afield in San Diego County* (Schad 1986). Hiking and camping use is confined to the access trail on the western slope to the mountaintop, where volunteer trails do not intersect known *A. ilicifolia* occurrences. Access to occurrences is also limited by the surrounding private lands and prior to the 2003 Cedar Fire, the moderately dense chaparral. Except for occasional volunteer trails from neighboring private lands, there are minimal ongoing recreational effects to these three occurrences. The other occurrence is affected to some extent by activities described below in the Poser Mountain occurrences.

The Viejas Mountain populations that occur adjacent to housing developments and the Viejas Indian Reservation and are also subject to proposed fuel treatment activities within the Wildland Urban Interface defense zone. Proposed fuel reduction activities within *A. ilicifolia* habitat are expected to be minimal however, due to the habitat being grassland. A bigger concern may be the potential to establish dozer created fuelbreaks on some of the flatter areas of occupied habitat during emergency fire suppression operations.

Occurrences on Viejas Mountain were burned over in the 2003 Cedar Fire. Because a large majority of the watershed was burned, aerial hydromulch was applied to a portion of the burned areas on the mountain as a Burned Area Emergency Rehabilitation treatment. Occupied and potential *A. ilicifolia* habitat was avoided during the hydromulching. Short and long term impacts to *A. ilicifolia* from wildfire and post burn soil stabilization efforts are unknown at this time. However, both the wildfire and post fire soil stabilization activity occurred after the yearly seed set for this annual plant. Increased accessibility to habitat after the fire and noxious nonnative weed invasion may be the greatest risks to these occurrences. Existing fences along roads below occurrences were reconstructed to prevent unauthorized OHV use on Viejas Mountain; monitoring has indicated that the barriers are effective at deterring continuing or new OHV trespass. In addition, monitoring of barriers along Anderson Road, also adjacent to habitat, indicate little to no trespass off road. Unauthorized grazing from adjacent lands continues intermittently when fences are down; the CNF continues to work with adjacent landowners to

resolve this situation.

Poser Mountain

The remaining two occurrences occur on Poser Mountain adjacent to the Indian Reservation and near a county road. Unauthorized cattle grazing, trash dumping, shooting, mountain biking, and unauthorized off-road driving have negatively affected these sites in the past. Fences and “no dumping” signs along Viejas Grade Road have deterred habitat degradation within occupied habitat on Poser and Viejas Mountain. There has been one trespass in the 20 monitoring visits within the last 3 years of monitoring of fence, gates, and barriers along Viejas Grade Road, adjacent to occupied habitat. Grading of the country road does not directly affect habitat. Invasive nonnative plants are mainly confined to the road edges.

The occurrences on Poser Mountain are within the Wildland Urban Interface threat zone, however because the *A. illicifolia* habitat is located within native grasslands, there is low likelihood that fuel modification would be needed within habitat. Fuel modification of the adjacent chaparral could increase effects from unauthorized uses in these locations however.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Acanthomintha illicifolia*:

- Consider establishment of the candidate Viejas Mountain RNA within the next three years
- Utilize the habitat suitability criteria and detection protocol developed for this taxon and apply to surveys at the project level. This will help to ensure that future projects and management actions with effects to this taxon will trigger the appropriate standards, even where occurrences are currently not known.
- Implement strategies in the Species Management Guide for *Acanthomintha illicifolia* (USDA Forest Service 1991).
- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Survey modeled habitat.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Monitor Forest boundary fences adjacent to *A. illicifolia* occurrences and repair as needed.
- Patrol access roads to Viejas and Poser Mountains for unauthorized shooting, dumping, and off-road vehicle use.
- Allow wildland fires to freely burn on Poser and Viejas Mountains. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities because some *Acanthomintha illicifolia* populations are adjacent to roads. Use ridgelines or base of mountains for fuel break construction. The use of hand line for fuel break construction is preferred (USDA Forest Service

1991).

- Minimize the use of the Poser and Viejas Mountain. Do not develop trails, campgrounds, roads, or other constructed facilities (USDA Forest Service 1991).
- Monitor known locations burned in the 2003 Cedar fire for recovery of plant populations. Survey for new populations in burned areas near to known locations.
- Monitor helimulched locations on Viejas Mountain (that avoided *Acanthomintha illilifolia*) for effects to suitable habitat.

Evaluation of Current Situation and Threats on National Forest System Lands

Acanthomintha ilicifolia is considered to have moderate vulnerability on National Forest System lands due to its restricted habitat – clay soils – and the close proximity of a few occurrences to roads, Wildland Urban Interface defense and threat zones, and unauthorized uses originating from adjacent lands. These conditions may potentially degrade habitat as a result of erosion, soil compaction, increased access, and invasive nonnative species establishment. The monitoring of fences and posting of "no dumping" signs has assisted in deterring additional habitat degradation on Poser and Viejas Mountain. The trend for this species appears to be stable on the Cleveland National Forest. Population numbers vary from year to year and are sufficient (greater than 5000 individuals in some years) to maintain genetic variability within populations. In addition, subpopulations on Poser and Viejas Mountains may have the potential for gene exchange among subpopulations. There is little to no risk of extirpation of these occurrences. However, the occurrences on Poser and Viejas Mountains are the only known occurrences on National Forest System lands. Landscape catastrophic events or activities associated with Wildland Urban Interface defense and threat zones and wildfire suppression – such as fuel break and hand line construction, staging areas, and introduction of invasive weeds – may be the most significant threats to these occurrences. Short-term adverse impacts to habitat caused by increased accessibility due to the Cedar fire are also possible. The Cleveland National Forest occurrences represent the eastern peripheral extension of the species' range, potentially having unique genetic variability essential for adaptations for possible range expansion or climatic changes.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6

B	B	A	C	B	C	A
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Acanthomintha ilicifolia is federally listed as Threatened, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the U.S. Fish and Wildlife Service. Because of this, it is reasonable to assume that no new roads, trails or campgrounds would be built in or near occupied habitat for this species under any alternative. For alternatives 2-6, the use of Cleveland National Forest standard S13 that avoids or mitigates impacts to *Acanthomintha ilicifolia* occupied habitat was considered in predicting the outcomes by alternatives on NFS lands.

Under Alternative 1, current management of *Acanthomintha ilicifolia* in a Back Country land use zone would continue. Conservation recommendations, standards and monitoring of unauthorized activities that apply to this taxon would remain in place. The Viejas candidate RNA and the Viejas Mountain Critical Biological land use zoning were not recommended in this alternative.

Under Alternative 2, populations on Viejas Mountain would receive enhanced protection by establishment of the Viejas candidate RNA in the Forest Plan Revision Record of Decision. All of Viejas Mt. would be zoned as Critical Biological. Populations on Poser Mountain would remain subject to impact in a Back Country land use zone.

Under Alternatives 3 and 6, populations on Viejas Mountain would receive enhanced protection by establishment of the Viejas candidate RNA in the Forest Plan Revision Record of Decision. All of Viejas Mountain would be managed as a Critical Biological land use zone, and much of Poser Mountain would be zoned Back Country Non-Motorized. The emphasis of these alternatives on conservation and recovery of at-risk species increases the likelihood that fencing would be maintained or improved and patrols to control unauthorized activities would increase result in an improved outcome for the species.

Under Alternative 4, neither the Viejas candidate RNA nor the Viejas Critical Biological zone is recommended.* Poser Mountain would be managed as a Back Country land use zone. This alternative increases emphasis on recreation opportunities, but also increases education and mitigation efforts to assure that recreation activities do not harm species-at-risk. This alternative could create a higher level of recreational impacts to *Acanthomintha ilicifolia* habitat over the long-term because the focus would be on sustaining the recreation resource by maintaining or expanding facilities at a moderate rate with less emphasis on sustainable dispersed recreation.

Under Alternative 4a, 98 acres of the known 213 occupied acres on NFS lands would be managed within a Critical Biological land use zone on Viejas Mountain. The recommendation to establish the Viejas RNA would be deferred to a decision to be made within 3 years after the Forest Plan Revision Record of Decision. Poser Mountain would be zoned as Back Country Non-Motorized. Recreation effects to *Acanthomintha ilicifolia* would expected to be less than alternative 4 as the recreation emphasis in this alternative would be to sustain the setting through management of dispersed recreation and to maintain

or expand existing facilities prior to constructing new ones at a low rate.

Under Alternative 5 both Poser and Viejas Mountains would be managed within the Back Country land use zone, which would allow motorized recreation on existing roads. The emphasis of this alternative on increasing motorized recreation may result in increased use of the roads in this area, leading to increased unauthorized off-route travel into occupied habitat. The occurrences on Poser Mountain are most likely to suffer negative impacts under this alternative. No Critical Biological Zones would be established in this alternative and no RNA's were proposed.

Under Alternative 6, the Viejas Mt. candidate RNA would be recommended and the zoning would be the same as under alternative 3 for this species. The emphasis on low impact recreation, visitor capacity controls, public education and habitat restoration would provide the greatest benefits to this taxon; this results in a higher viability rating.

* Note: In alternative 4, the DEIS CBZ table does not recommend the Viejas CBZ; however the Alternative 4 map shows it as recommended. The viability outcome discussion is based on the DEIS table.

Viability Outcomes for All Lands Within the Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Acanthomintha ilicifolia is restricted to clay soils on mesas and slopes in vernal pools, chaparral, coastal sage scrub, and grassland habitats of western San Diego County and northern Baja California, Mexico. These habitat types are in continuing decline, especially in coastal, urban areas. Development, recreation use, dumping, and off-road vehicle use threaten *Acanthomintha ilicifolia* populations at lower elevations. Fourteen occurrences, or 23 % of documented occurrences, are extirpated. Most of the extirpations are a result of development. In addition, some of the extant occurrences are threatened by future development or potential invasive nonnative plants on private lands. However, a number of the extirpated occurrences have been transplanted with moderate success (California Natural Diversity Database 2002). Thirteen sites are currently under protected management, located on The Nature Conservancy, other federal lands, or on protected open spaces in San Diego County. National Forest System lands play an important role in protecting a small proportion of the existing occurrences of *Acanthomintha ilicifolia*, but the variation in level of protection is not enough to substantially change the outlook for the species by Forest Plan alternative.

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Abronia villosa var. aurita

**Acanthoscyphus parishii var.
abramsii**

Acanthoscyphus parishii var. abramsii

Acanthoscyphus parishii (Parry) Small var. *abramsii* (E.A. McGregor) Reveal

(Abram's flowery puncturebract)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4?T2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Acanthoscyphus parishii var. *abramsii* occurs in the southern outer South Coast Ranges and Western Transverse Ranges in Santa Barbara and Ventura Counties (Reveal 2004).

Distribution in the Planning Area

The California Natural Diversity Database (2004) lists six historical records for occurrences of *Acanthoscyphus parishii* var. *abramsii*, the most recent of which is from 1961. Little information is available for these occurrences, but all are on or adjacent to the Los Padres National Forest. These locations are: Cachuma Mountain, West Big Pine Mountain/Big Pine Mountain, and McKinley Mountain/Mission Pines in the San Rafael Mountains; and Reyes Peak, Mount Pinos/Lockwood Valley, and the Topatopa Mountains in the western Transverse Ranges (California Natural Diversity Database 2004, CalFlora 2002).

Taxonomy and Natural History

Acanthoscyphus parishii var. *abramsii* is a dicot in the buckwheat family (Polygonaceae) (Hickman 1993). Four subspecies are recognized (Reveal 2004), three of which are on the California Native Plant Society's List 1B, including *Acanthoscyphus parishii* var. *goodmaniana* [Cushenbury flowery puncturebract] (listed as endangered under the federal Endangered Species Act). *Acanthoscyphus*

parishii var. *abramsii* is distinguished from the other subspecies by the number, color, and length of the awns on the involucre (the group of bracts below the flower) (Reveal 2004). *Acanthoscyphus parishii* var. *abramsii* is 2-12 inches (5-30 cm) tall with oblanceolate to obovate leaves. The involucre has 7-16 dark, red awns, the longest being 0.1-0.16 inches (3-4 mm) long. The perianth is white to pink, and typically blooms between June and August.

Habitat Description

Acanthoscyphus parishii var. *abramsii* grows in chaparral on soils derived from sandy or shale substrates at elevations of 3,750–6,750 feet (1,150–2,060 meters) (Reveal 2004, California Natural Diversity Database 2004). Smith (1998) describes the habitat of *Acanthoscyphus parishii* var. *abramsii* as "open, gravelly or sandy slopes."

Occurrence Status

There has been little field verification of the historical occurrences and population trends are unknown (Stephenson and Calcarone 1999). There is an extant occurrence located in the Mutau Creek watershed and an extant occurrence on Reyes Peak (Burgess, pers. comm. 2003).

OCCURRENCE DATA – *Acanthoscyphus parishii* var. *abramsii* (Abram’s flowery Puncturebract)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1923	TOPA TOPA MOUNTAINS. EXACT LOCATION NOT KNOWN. MAPPED AT NBBD TO INCLUDE ENTIRE RANGE, T05N/R21W/S12	VEN
2	U	U	REYES PEAK, T06N/R23W	VEN
3	U	U	CACHUMA MOUNTAIN, T07N/R29W/S35	SB
4	U	1961	WEST BIG PINE MOUNTAIN AT THE LOOKOUT TOWER, SAN RAFAEL MOUNTAINS. COLLECTION BY FRENCH CITES THE FOLLOWING T-R-S: T07N R26W SEC18, ALTHOUGH THIS REGION IS UNSURVEYED	SB

5	U	1930	MISSION PINE, SAN RAFAEL MOUNTAINS. SEVERAL "MISSION PINE" PLACE NAMES IN THIS AREA. SITE MAPPED AT MISSION PINE CAMP ON EAST SIDE OF SAN RAFAEL MOUNTAIN. OTHERS INCLUDE MISSION PINE SPRING CAMPGROUND, MISSION PINE BASIN, AND MISSION PINE BASIN CAMPGROUND, T07N/R28W/S02	SB
6	U	1905	STAUFFER POST OFFICE, MT. PINOS. MAPPED AT HISTORIC SITE OF STAUFFER IN THE LOCKWOOD VALLEY. OCCURRENCE INCLUDES COLLECTIONS FROM MT. PINOS, MT. PINOS-SOUTH SIDE, AND MT. PINOS-LOCKWOOD VALLEY, T08N/R21W/S23	VEN

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- VEN=Ventura County
- SB=Santa Barbara County

Threats

No threats have been identified for *Acanthoscyphus parishii* var. *abramsii*. Its habitat in backcountry areas provides protection from most forms of human disturbance, but small population size may result in vulnerability to off trail impacts resulting from cross-country travel by hikers.

This taxon has the potential to be impacted by chipping or placement of other organic material following fuel treatments. Project design could avoid or minimize this impact (Eliason, pers. comm. 2005).

Conservation and Management Considerations

There are few recent records of *Acanthoscyphus parishii* var. *abramsii*, and surveys should be conducted of the historical occurrences to document current population status.

Evaluation of Current Situation and Risk on National Forest System Lands

Acanthoscyphus parishii var. *abramsii* is known from only about six locations that are widely distributed across the San Rafael and Topatopa Mountains, and the Big Pine/Reyes Peak area. None of the known occurrences are large in size or their status is poorly known, and this creates a risk that land-disturbing uses of National Forest System land could result in unintended impacts.

Based upon the above analysis this species has been assigned the following threat category:

- 5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome Statements For National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Acanthoscyphus parishii var. *abramsii* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Acanthoscyphus parishii var. *abramsii* appears to have persisted, over time, in areas subject to low levels of dispersed recreation, but better information is needed to support this conclusion. Increased use of National Forest System lands for recreation use, especially motor vehicle based recreation, could create additional risks for *Acanthoscyphus parishii* var. *abramsii* as a result of unauthorized off-trail and off-road travel by motorized and non-motorized vehicles. Alternative 4a would reduce this risk but not significantly in the locations of these populations. Fuel treatment locations if proposed, would not vary by alternative.

For All Lands Within the Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6

B	B	B	B	B	C	B
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Since all of the known occurrences of *Acanthoscyphus parishii* var. *abramsii* are located on National Forest System lands there is no difference in predicted outcomes.

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Personal Communications

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Eliason, Scott. District Botanist, Mountaintop Ranger District, San Bernardino National Forest. [Personal conversation with Deveree Kopp, District Botanist, Mountaintop Ranger District, San Bernardino National Forest.] 30 March, 2005.

Acanthomintha ilicifolia

**Acanthoscyphus parishii var.
cienegensis**

Acanthoscyphus parishii* var. *cienegensis

Acanthoscyphus parishii (Parry) Small var. *cienegensis* (Ertter) Reveal (Cienega Seca flowery puncturebract)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4?T1; S1.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Acanthoscyphus parishii var. *cienegensis* is endemic to the eastern San Bernardino Mountains in the vicinity of Coon Creek and Cienega Seca Creek, and also Rattlesnake Canyon to Tip Top Mountain (Hickman 1993, USDA Forest Service 2002).

Distribution in the Planning Area

A total of 19 occurrences of *Acanthoscyphus parishii* var. *cienegensis* have been recorded, all of which are on the San Bernardino National Forest (USDA Forest Service 2002); however, only three are listed in the California Natural Diversity Database (2004). In 1990, an occurrence at Coon Creek comprised more than 1,000 plants, and an occurrence adjacent to Cienega Seca Creek site comprised approximately 20 plants. A third occurrence on Highway 38 near Cienega Seca Creek had no plants evident where basal rosettes had been observed 10 years earlier (California Natural Diversity Database 2004). Several small occurrences have been reported from carbonates near Tip Top Mountain, several miles to the north, some of which appear to be intermediate with *Acanthoscyphus parishii* var. *goodmaniana* (USDA Forest Service 2002).

Taxonomy and Natural History

Acanthoscyphus parishii var. *cienegensis* is a dicotyledonous plant in the buckwheat family (Polygonaceae). Four varieties of *A. parishii* are recognized (Hickman 1993) in California. Three

varieties, including var. *goodmaniana*, federally listed as endangered, are on California Native Plant Society's List 1B. *Acanthoscyphus parishii* var. *cieneensis* is an annual herb that flowers June-September (California Native Plant Society 2001). Plants are apparently less abundant in dry years (California Natural Diversity Database 2004). This taxon is distinguished from the other subspecies by the number and length of the awns on the involucre (the group of bracts below the flower) (Hickman 1993).

This taxon is most readily distinguished from the listed variety *A. p.* var. *goodmaniana* by the number of involucral awns. *Acanthoscyphus parishii* var. *cieneensis* has 7-10 involucral awns where *A. p.* var. *goodmaniana* has 4 (Hickman 1993).

Occurrences at Tip Top Mountain and upper Rattlesnake Canyon, which are on carbonate soils, form an intergrade zone with *Acanthoscyphus parishii* var. *goodmaniana*, with some individuals morphologically intermediate between these varieties (B. Ertter, pers. comm.). These occurrences are managed as var. *goodmaniana*.

Acanthoscyphus parishii var. *cieneensis* is an annual that exhibits high annual variability. This taxon probably responds positively following fire and above-average precipitation. Surveys conducted during below-average precipitation or immediately post-fire may fail to detect habitats that are actually occupied during average and above-average precipitation years. Based on post-fire response by *A. p.* var. *goodmaniana*, this taxon should be detectable with large numbers and rosette size during the first post-fire summer.

Habitat Description

Acanthoscyphus parishii var. *cieneensis* grows in sandy soils (of carbonate or granitic origin) and on dry gravelly banks in upper montane coniferous forest, pinyon-juniper woodlands, and Joshua tree woodlands at elevations of 6,900-8,000 feet (2,105-2,450 meters) (California Natural Diversity Database 2004, California Native Plant Society 2001). *Acanthoscyphus parishii* var. *cieneensis* inhabits bare, gentle-south facing slopes, alluvial terraces, disturbed road cuts, and other open areas. *Acanthoscyphus parishii* var. *cieneensis* has been found in association with *Pinus jeffreyi* and *Salvia pachyphylla* (California Natural Diversity Database 2004).

Occurrence Status

Abundance of *Acanthoscyphus parishii* var. *cieneensis* may fluctuate from year to year in response to rainfall, being absent during dry years (California Natural Diversity Database 2004). All of the recorded are presumed to be extant

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Acanthoscyphus parishii* var. *cienegensis* (Cienega Seca flowery puncturebract)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	1,000+	1990	Coon Creek, N of equestrian camp 9, ca. 1 mi. E of Heart Bar Campground. ca. 0.4 mi. from FR 1N02 on the N side of the creek. SBNF.	SBD
2	20	1990	S side of Cienega Seca Creek, near Heart Bar Campground and above Big Meadows. Just E of FR1N02 crossing (to Heart Bar Campground) on roadcut at crest of small ridge and in dry dammed area. Disturbed by earthmoving activities, equestrian trail, and forest visitor use. SBNF.	SBD
3	0 in 1990	1980, 1990	Cienega Seca Creek along Hwy 38, ca. 1.5 mi. NE of FR1N02. Along Hwy with places for cars to stop. Granitic sand. Type locality. SBNF.	SBD
*	U	1998	Multiple records in the Rattlesnake Cn and Tip Top Mountain area forming an intergrade zone with <i>A. p.</i> var. <i>goodmaniana</i> .	

- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Populations near highways, forest roads, trails, and campsites may be vulnerable to disturbance from

road maintenance activities and vehicle travel off of designated Forest roads. Plants found on carbonate soils may be threatened by mining activities (USDA Forest Service 2002). The Cienega Seca area has moderate tree mortality and will be treated for Forest Health. Forest thinning projects would be analyzed at the project level, and may have long term beneficial effects (following short-term adverse effects).

Conservation and Management Considerations

The primary conservation strategy for the portion of the distribution of this taxon on carbonate is to implement the CHMS. For the entire range, the strategy is to improve knowledge of its distribution, taxonomy and ecological response to fire and forest thinning. The following is a list of conservation practices that should be considered for *Acanthoscyphus parishii* var. *cienegensis*:

- Implement the Carbonate Habitat Management Strategy.
- Encourage academic research on the intergradation of this variety with the listed *Acanthoscyphus parishii* var. *cienegensis*.
- Monitor responses of this taxon following fire or forest thinning.
- Survey all new occurrences of *Acanthoscyphus parishii* var. *cienegensis* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Acanthoscyphus parishii* var. *cienegensis* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Acanthoscyphus parishii* var. *cienegensis* in the planning area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Acanthoscyphus parishii var. *cienegensis* is a narrow endemic widely scattered but locally common on loose carbonate and granitic soils of the eastern San Bernardino Mountains. While some of the recorded occurrences are vulnerable to identified threats, many are remote and inaccessible to vehicle impacts. Also, this species shows a tolerance for moderate levels of surface disturbance. Mining and Vegetation Management impacts will be addressed at the project level, and will be guided by provisions of the Carbonate Habitat Management Strategy.

Based on this analysis, *Acanthoscyphus parishii* var. *cienegensis* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Acanthoscyphus parishii var. *cienezensis* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Acanthoscyphus parishii* var. *cienezensis* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Acanthoscyphus parishii* var. *cienezensis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

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**Acanthoscyphus parishii var.
abramsii**

**Acanthoscyphus parishii var.
goodmaniana**

Acanthoscyphus parishii var. goodmaniana

Acanthoscyphus parishii (Parry) Small var. *goodmaniana* (Ertter) Reveal (Cushenbury flowery puncturebract)

Management Status

Federal: Endangered; Critical Habitat designated December 24, 2002 (67 FR 78569).

California: None

Heritage Rank: G4?T1; S1.1 (California Natural Diversity Database)

California Native Plant Society - List 1B; R-E-D Code 3-3-3

Critical Habitat (CH) for *Acanthoscyphus parishii* var. *goodmaniana* was designated by the USFWS on December 24, 2002 (67 Federal Register 78569) (U.S. Fish and Wildlife Service 2002). In determining which areas to designate as CH the USFWS considers those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These features are termed Primary Constituent Elements (PCEs) and they are summarized in the final rule (U.S. Fish and Wildlife Service 2002).

General Distribution

Acanthoscyphus parishii var. *goodmaniana* is endemic to the western half of the carbonate belt on the north slope of the San Bernardino Mountains, with an intergrade zone between this variety and *Acanthoscyphus parishii* var. *cienegensis* present at the southeastern most extent of the San Bernardino Mountains carbonate belt. It occupies the second smallest area of the five federally listed carbonate endemic plants (California Natural Diversity Database 2004).

Distribution in the Planning Area

Acanthoscyphus parishii var. *goodmaniana* occurs entirely on the San Bernardino National Forest and at a few occurrences to the north on private and BLM lands. Plants clearly attributable to this taxon are distributed from South Peak on White Mountain east to Terrace Springs (near the old Partin Mine), a range of about 15 miles (24 km). Other known sites include Cushenbury Springs; Cushenbury, Marble, Arctic, Wild Rose and Furnace Canyons; near the abandoned Green Lead gold mine; north of Holcomb Valley; and White Mountain. Occurrences recorded from the southeastern end of the carbonate belt along the Helendale Fault zone near Tip Top Mountain, Mineral Mountain, Rattlesnake and Old Timer Canyons, and at Rose Mine appear to be intermediate between *Acanthoscyphus parishii* var. *goodmaniana* and *Acanthoscyphus parishii* var. *cienegensis* (Ertter pers. comm., USDA Forest Service 2000). Currently, these occurrences are being managed with the presumption that they fall within the listed endangered variety *goodmaniana* (USDA Forest Service 2003).

Taxonomy and Natural History

The new combination *Acanthoscyphus parishii* var. *goodmaniana*, formerly named *Oxytheca parishii* var. *goodmaniana* (Reveal 2004) is included in the treatment for this group in Volume 5 of the Flora of North America (Reveal 2005). The combination has also been accepted by the Jepson Flora Project in its index of California Plant Names (Jepson Interchange 2005).

Acanthoscyphus parishii var. *goodmaniana* is a dicotyledon a member of the buckwheat family (Polygonaceae). Plants germinate in the fall following the first rains and exist as a vegetative rosette through the winter months. The basal rosette consists of relatively broad, oblong-obovate, green leaves, which are followed in the spring by a slender leafless inflorescence. As the inflorescence matures the leaves wither and dry, so that by the time of late flowering (May-June) or fruit ripening the plant typically has no living leaves at all.

All late season photosynthesis is presumably carried on by the green stems and the involucre bracts. The flowers are white with a reddish midrib and are apparently insect-pollinated. Specific pollinators, germination requirements, seed longevity, and most other aspects of the biology of this species are largely unknown, but there are some recent observations on the insect associates of this plant.

Based on limited observations in the summer of 1998, it appears that the insect pollinators of this species are generalists, such as various flies and possibly small beetles, rather than highly specialized pollinators. Small gray beetles of the family Dasitidae were found visiting the flowers. At least two plant feeding insects have been identified attacking this species, including the bordered plant bug (Largidae: *Largus cinctus californicus*), which is a generalist sap feeder, and an unidentified leaf beetle (Chrysomelidae) which was observed eating the flowers. In addition to the above, a number of big-eyed bugs (Lygaeidae: *Geocoris*) were found on the plants, but these were probably predators on other insects rather than plant feeders (S Morita, pers. comm.; G. Ballmer, pers. comm.).

Acanthoscyphus is a mono-specific genus with four varieties, all endemic to California: *Acanthoscyphus parishii* var. *goodmaniana*, *Acanthoscyphus parishii* var. *abramsii*, *Acanthoscyphus parishii* var. *cienezensis*, and *Acanthoscyphus parishii* var. *parishii*. *Acanthoscyphus parishii* var. *goodmaniana* is best distinguished from the other varieties by having few (4–5) ivory-colored involucre awns (Reveal 2005). In the west half of the carbonate belt, plants are morphologically distinct as variety *goodmaniana*. However, the vicinity of Tip Top Mountain and Rattlesnake Canyon supports an intergrade zone where plants appear to be intermediate between this taxon and *Acanthoscyphus parishii* var. *cienezensis*.

Acanthoscyphus parishii var. *goodmaniana* is an annual herb that blooms May–September (California Native Plant Society 2001). Abundance of this species is dependent on rainfall (U.S. Fish and Wildlife Service 1997). In 1990, the estimated number of plants was fewer than 3,000 in four known populations (U.S. Fish and Wildlife Service 1997); however, abundance varies with rainfall, and more populations were located following the El Niño event in 1998 (USDA Forest Service 2003). Abundance also increases in years following fire.

Acanthoscyphus parishii var. *parishii* is the most widespread and distinctive variety with its numerous (10–36) long (ca. 4–4.5 mm) awns on the involucre lobes. These awns are thicker and much more conspicuous than those in the other varieties. It is also the most widespread variety, due to its habitat preferences: openings on granitic slopes in yellow pine forest. It is widespread from Big Bear, west through the Crestline/Arrowhead area, and then continuing through the San Gabriel Mountains to the mountains of Ventura County (Reveal 1989).

Variety *cienezensis* is the most poorly known of the three varieties and the one most similar to variety

goodmaniana. It is intermediate in involucre awn number (7-10) and length (3-4 mm) between the other two varieties. Variety *cienegensis* occurs on well-drained gravelly or sandy granite or carbonate substrates from Tip-Top Mountain to Cienega Seca near Onyx Peak, Hart Bar, and Coon Creek Jumpoff.

Habitat Description

Acanthoscyphus parishii var. *goodmaniana* occurs only on carbonate soils, often steep, and often among loose scree or raveling slopes. As with the other endemic carbonate plants, *Acanthoscyphus parishii* var. *goodmaniana* grows in areas characterized by an open canopy structure and little to no accumulation of organic material at the soil surface.

Populations occur at elevations between 4000 and 7800 ft. (1200-2380 m) in the pinyon-juniper woodland (Reveal 1989) and Jeffrey pine-western juniper (Neel, 2000) vegetation zones.

Occurrence Status

A total of at least 50 occurrences were known as of 1998 (Sosa pers. comm.), which is a substantial increase from the four known in 1992 (Tierra Madre 1992), or the 15 reported in 1994 (USFWS 1997). A clear understanding of the abundance and distribution of this plant within its narrow range is still developing.

Acanthoscyphus parishii var. *goodmaniana* populations numbers are highly variable (White 1997) at any given site from year to year, but plants can be locally abundant after particularly favorable years. Populations vary in response to fire, rainfall and other climatic conditions, so that at a site where there was a substantial population one year there may be few to none the next.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences (refer to the Carbonate Habitat Management Strategy and associated GIS data for more thorough and precise occurrence distribution and mapping). There are additional occurrences not in the database.

OCCURRENCE DATA – *Acanthoscyphus parishii* ssp. *goodmaniana* (Cushenbury puncturebract)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	> 1000 in 1990	1990	Close to Greenlead Mine; N of Fawnskin, 0.3 mi. NE of Greenlead Mine. Open S-facing limestone slopes w/ talus or rocky soils. May prefer areas of natural disturbance. Assoc. w/ pinyon, <i>Juniperus</i> , <i>Cercocarpus</i> . Primary threat from expanded limestone mining, renewed gold mining may also threaten occ. SBNF.	SBD
2	several hundred in 1990; 10,000 in 1995	1990	Along ridge N of Holcomb Valley and W of Upper Holcomb Valley, San Bernardino Mountains. Pinyon-western juniper woodland. W/ <i>Chrysothamnus viscidiflorus</i> , <i>Ceanothus greggii</i> , <i>Eriodictyon trichocalyx</i> , <i>Fremontodendron californicum</i> , <i>Achnatherum hymenoides</i> , <i>A. coronatum</i> , <i>Arctostaphylos patula</i> , <i>Linum lewisii</i> . Open SE-facing limestone slope. <i>Eriogonum ovalifolium vineum</i> and <i>Arabis shockleyi</i> also in vicinity.	SBD

			Imminent threat from limestone mining. Jeep road through eastern edge of population. SBNF.	
3	> 1000 in W colonies in 1994; 5000 in E colony in 1995	1995	Slopes near East Fork Canyon, ca. 1.3 mi. NE of Greenlead Mine, San Bernardino Mountains. Pinyon-juniper woodland on gravelly carbonate soils. Associated w/ <i>Cercocarpus ledifolius</i> , <i>Arctostaphylos glauca</i> , <i>Fremontodendron californicum</i> , <i>Chrysothamnus viscidiflorus</i> , <i>Achnatherum coronatum</i> , <i>A. hymenoides</i> , <i>Artemisia dracunculus</i> . 5 colonies. Threatened primarily by limestone mining and associated road expansion as well as ORVs. SBNF.	SBD
4	'locally common' in 1990	1980	SE of Cushenbury Springs on NE side of Hwy 18, just N of Whiskey Springs, San Bernardino Mountains. Threatened by limestone mining activities. On S-facing limestone talus slope. Associates incl. <i>Yucca</i> , <i>Pinus monophylla</i> , <i>Coleogyne</i> , <i>Forsellesia</i> , <i>Eschscholzia minutiflora</i> , <i>Mimulus fremontii</i> , <i>Hulsea callicarpa</i> , <i>Caulanthus cooperi</i> , <i>Parishella californica</i> . Plants in small canyon on NE side of Hwy 18, ca. 0.1 mi. inside forest boundary. SBNF.	SBD
5	U	1994	SE slope of Mineral Mountain above Rattlesnake Canyon, San Bernardino Mountains. Pinyon-juniper woodland on carbonate soils w/ <i>Cercocarpus ledifolius</i> , <i>Chrysothamnus viscidiflorus</i> , <i>Ceanothus greggii</i> , <i>Ephedra viridis</i> , <i>Salvia pachyphylla</i> , <i>Achnatherum coronata</i> , <i>Phacelia douglasii</i> , <i>Cryptantha confertiflora</i> . On ridge ca. 500' in elev. Above JCT of FR2N02 and 2N73Y. <i>Arabis shockleyi</i> also occurs here. Entire area is under mine claim. SBNF.	SBD
6	3000 in 1995	1995	N slope of Blackhawk Mountain, ca. 1.4 mi. NW of Silver Peak, San Bernardino Mountains. Mapped along W-facing canyon wall. Pinyon-juniper woodland on carbonate soils derived from bedrock or talus. Associated w/ <i>Coleogyne ramosissima</i> , <i>Ephedra viridis</i> , <i>Achnatherum coronatum</i> , <i>A. speciosum</i> . <i>Astragalus albens</i> , <i>Erigeron parishii</i> , <i>Eriogonum ovalifolium</i> ssp. <i>Vineum</i> , <i>Astragalus albens</i> also present. BLM-Barstow RA.	SBD
7	200 in 1995	1995	N slope of Blackhawk Mountain, ca. 1.9 mi. NNW of Silver Peak, San Bernardino Mountains. Pinyon-juniper woodland/blackbrush scrub on carbonate soils on steep slope. Associated w/ <i>Ceanothus greggii</i> , <i>Gutierrezia microcephala</i> , <i>Achnatherum coronatum</i> , <i>Prenanthes exiguua</i> , <i>Aristida purpurea fendleriana</i> . Mapped along ridge. Area may be under mining claim. BLM-Barstow RA.	SBD
8	1000 in 1996	1996	Ridgetop E of Marble Canyon and NW of Burnt Flat, San Bernardino Mountains. Pinyon-Utah juniper woodland on limestone derived soils. W/ <i>Prunus fasciculatum</i> , <i>Arctostaphylos glauca</i> , <i>Chrysothamnus viscidiflorus</i> , <i>Achnatherum coronatum</i> , <i>Aristida purpurea fendleriana</i> .	SBD

			Along ridge between peak 6403' and 6005'. <i>Arabis shockleyi</i> and <i>Eriogonum ovalifolium vineum</i> also in area. Area is under mining claim. SBNF.	
9	19 in 1994	1994	N slope of Blackhawk Mountain, ca. 0.5 mi. NW of Silver Peak, San Bernardino Mountains. Pinyon-juniper woodland in carbonate soils. Associated w/ <i>Yucca brevifolia</i> , <i>Cercocarpus ledifolius</i> , <i>Coleogyne ramosissima</i> , <i>Arctostaphylos glauca</i> , <i>Chrysothamnus viscidiflorus</i> , <i>Achnatherum coronatum</i> . Mapped on NE-facing slope. <i>Eriogonum ovalifolium vineum</i> and <i>Arabis shockleyi</i> also in area. Area is under mineral claim; spoil from nearby road threatens plants. SBNF.	SBD
10	500 in 1994	1994	Unnamed tributary to Marble Canyon, ca. 0.5 mi. ESE of mouth of Arctic Canyon, San Bernardino Mountains. Pinyon-juniper woodland on gravelly carbonate soils w/ <i>Cercocarpus ledifolius</i> , <i>Arctostaphylos glauca</i> , <i>Salvia pachyphylla</i> , <i>Chrysothamnus viscidiflorus</i> , <i>Achnatherum coronatum</i> , <i>Phacelia fremontii</i> , <i>Ceanothus greggii</i> . In canyon at W end of Marble Canyon pit on E-facing slope above mine tailings. Mine tailings threaten to bury this population. PVT.	SBD
11	1,000s in 1996	1996	Upper Furnace Canyon, ca. 0.7 mi. up from confluence w/ Wild Rose Canyon, San Bernardino Mountains. Loose, fine colluvial sand associated w/ talus and steep mountainsides. Mapped in upper portion of canyon from 6000'-6600'. Land owner: U.	SBD
12	1000 in 1994	1994	Upper slopes along W side of Furnace Canyon, ca. 1.1 mi. SW of mouth of Wild Rose Canyon, San Bernardino Mountains. Pinyon woodland on loose, gravelly talus derived from carbonate. Associated w/ <i>Cercocarpus ledifolius</i> , <i>Cryptantha holoptera</i> , <i>Bromus tectorum</i> , <i>Descurainia pinnata</i> , <i>Gilia austro-occidentalis</i> , <i>Phacelia fremontii</i> . Mapped on E-facing slopes. Area is under mineral claim. Tailings from adjacent mining operation threaten to bury site. PVT.	SBD
13	250 in 1994	1994	White Mountain, ca. 0.9 mi. NNE of South Peak, San Bernardino Mountains. Pinyon-juniper-canyon live oak woodland on talus soils derived from carbonate bedrock. Associated w/ <i>Cercocarpus ledifolius</i> , <i>Chrysothamnus viscidiflorus</i> , <i>Ceanothus greggii</i> , <i>Salvia pachyphylla</i> , <i>Achnatherum coronatum</i> , <i>Phacelia</i> . Site is about 150 m E of road and 600 m NW of White Mountain 7727' benchmark. Full extent of population unknown. Area is under mining claim. SBNF.	SBD
14	> 5300 in 1994; 1500 in SW colony in	1995	Ridgetop and eastern slopes of White Mountain, mostly near and N of S Peak, San Bernardino Mountains. Pinyon-juniper-canyon live oak woodland on loose gravelly talus derived from carbonate bedrock. Associated w/ <i>Cercocarpus ledifolius</i> , <i>Chrysothamnus viscidiflorus</i> , <i>Ceanothus greggii</i> , <i>Achnatherum coronatum</i> , A.	SBD

	1995		<i>hymenoides, Elymus</i> . Full extent of this population unknown. Roads, ORV use. Area is also under a mining claim. SBNF.	
15	U	199U	Vicinity of Tip Top Mountain and Rose Mine, San Bernardino Mountains. Growing on limestone or a mixed lithology of limestone and dolomite. Exact location unknown. Plants in this area are morphologically distinct and may represent a new taxon. SBNF.	SBD
16	350 in 1995	1995	S end of Monarch Flat, ca. 0.7 mi. N of Whiskey Spring, San Bernardino Mountains. Pinyon-juniper woodland on alluvial carbonate soils. Associated w/ <i>Yucca brevifolia</i> , <i>Cercocarpus ledifolius</i> , <i>Arctostaphylos glauca</i> , <i>Achnatherum coronatum</i> , <i>Penstemon eatonii</i> , <i>Abronia nana covillei</i> . Mapped along road. <i>Arabis shockleyi</i> and <i>Eriogonum ovalifolium var vineum</i> also present. Probably under mining claim. Frequented by ORVs. PVT/SBNF.	SBD
615289 (RSA)	U	1998	San Bernardino Mts., NW end of Holcomb Valley, near 34 ° 19' 11"N/116 ° 54' 54"W, T3N/R1E near center S30, elev.7860 ft., open woodland (Boyd/RSA)	SBD
616165 (RSA)	U	1998	San Bernardino Mts., Blackhawk Mountain, off Rd. 3N36, N of peak '6309', near 34 ° 20' 43"N/116 ° 49' 31"W. T3N/R1E/NE ¼ S13. elev. 5700 ft.(Soza/RSA)	SBD
616166 (RSA)	U	1998	San Bernardino Mts., W of Upper Holcomb Valley, S of John Peak, near 34 ° 18' 51"N/116 ° 54' 47"W, T3N/R1E/NE ¼ S30. elev. 7550 ft. (Soza/RSA)	SBD
616176 (RSA)	U	1998	San Bernardino Mts., E. of Marble Cyn. S of Mitsubishi Cement haul Rd. Near 34 ° 20' 44"N/116 ° 52' 08"W/T3N/R1E, NW ¼ S15. elev.5450 ft.(Soza/RSA)	SBD
657040 (RSA)	U	2000	Southcentral Mojave Desert Region, desert slope, above Lucerne Valley: Mitsubishi Cement Corp. proposed mine expansion area. Lower slopes of mountains, above bajada, N,E and W facing slopes on pvt. Land just E of Marble Cyn. T3N/R1E/S15 NW ¼ (White/RSA)	SBD
632477 (RSA)	U	1998	San Bernardino Mountains region, Blackhawk Mountain area: W of Silver Peak, on N-facing slope below mapped pk. "6624";T3N/R2E/S19, NW ¼ elev. 6500 ft. (White/RSA)	SBD
334707 (RSA)	U	1978	San Bernardino Mts., Cushenbury Cyn. Elev. 1450m	SBD
627448 (RSA)	U	1998	San Bernardino Mts., N slope above specialty minerals operations: steep ridge between Wild Rose Cyn. And Arctic Cyn. (White/RSA) // desert slope above Lucerne Valley, Specialty Minerals Inc. area W of Arctic Cyn., PVT land N of NF boundary (T3N/R1E/S17)	SBD
138395 (UCR)	U	1997	(White/UCR)	
632110 (RSA)	U	1998	San Bernardino Mts., Arrastre Creek watershed, Terrace Springs area in/near former site of Partin limestone mine. SE of disused quarry, at peak "5469" and on E-facing Cyn. Below peak.T3N/R2E/S21 (USGS 7.5' Big Bear)	SBD

			(White/RSA)	
627602 (RSA)	U	1998	Southcentral Mojave desert region, N slope above Lucerne Valley, above Specialty Minerals Inc.'s Marble Cyn. Quarry, T3N/R1E/S16, SE ¼ elev. 5600 ft.	SBD
627618 (RSA)	U	1998	Southcentral Mojave Desert region, Mountain Crest above Lucerne Valley, W of John Peak, T3N/R1E/S30, elev. 7650 ft. (White/RSA)	SBD
183913 (RSA)	U	1932	San Bernardino Mts., Green Lead Mine, elev. 7200 ft. (Munz/RSA)	SBD
104970 (UCR)	U	1997	San Bernardino NF, ca. 1+ air mi. NE of Hitchcock Spring & 2+ air mi. NNE of Delmar Mt. On both sides of Mine Haul Rd. T3N/R1W/S24/ SW ¼ of SW ¼ (Sarish/UCR)	SBD

- *U* = Unknown
- * = an occurrence number has not been assigned
- *SBNF* = San Bernardino National Forest
- *SBD* = San Bernardino County

Threats

The primary threat to *Acanthoscyphus parishii* var. *goodmaniana* is loss and degradation of habitat resulting from limestone mining (U.S. Fish and Wildlife Service 2001). Mining activities are ongoing in this species' habitat on the San Bernardino National Forest, as well as on patented claims (U.S. Fish and Wildlife Service 2001).

The long-term conservation of this species is expected to be achieved through implementation of the Carbonate Habitat Management Strategy (CHMS), which was developed collaboratively by a diverse group of affected parties and completed in April 2003. Implementation of this strategy will provide for the recovery of four threatened and endangered carbonate endemic plant species while also providing for continued economically important limestone mining. The CHMS defines a set of land management categories ranging from expected and current mining to Carbonate Habitat Reserves that will be managed for the conservation of the listed plants and habitat. Collaborating parties signed a Memorandum of Understanding (MOU), committing the SBNF to administer the strategy as future mining projects proceed and the habitat reserve is assembled.

OHV use, road maintenance, fuels and vegetation treatments, exotic species (primarily cheatgrass), power line maintenance, fuel wood collection, and small scale gold mining also pose threats to this taxon. These threats are addressed indirectly by the CHMS and directly by Forest Plan Standards, and for several occurrences these threats have been abated through corrective measures from the Carbonate Plants and Province Programmatic consultations.

Conservation and Management Considerations

The primary conservation strategy for *Acanthoscyphus parishii* var. *goodmaniana* is to implement the Carbonate Habitat Management Strategy and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Implement the Carbonate Habitat Management Strategy.
- Utilize the habitat suitability criteria and detection protocol developed for this taxon and apply to

surveys at the project level. This will help to ensure that future projects and management actions with effects to this taxon will trigger the appropriate standards, even where occurrences are currently not known.

- Survey all new occurrences of *Acanthoscyphus parishii* var. *goodmaniana* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Acanthoscyphus parishii* var. *goodmaniana* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Acanthoscyphus parishii* var. *goodmaniana* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas and CHMS Habitat Inventory.

Evaluation of Current Situation and Risks on National Forest System Lands

Acanthoscyphus parishii var. *goodmaniana* is a locally-common narrow endemic species known only to occur in the north-eastern San Bernardino Mountains, and entirely on carbonate. Some of these carbonate habitat areas are protected from identified threats, although many others are not currently protected.

Based on the above analysis, *Acanthoscyphus parishii* var. *goodmaniana* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	B	C	B

Acanthoscyphus parishii var. *goodmaniana* is listed under the Endangered Species Act of 1973, as amended, as endangered, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

The viability of this species is tied tightly to protection and management of carbonate habitat. Existing protections afforded this species and its critical habitat under the Endangered Species Act provide considerable baseline protection. With full implementation of the CHMS, viability for this species on NFS lands will be secure.

The CHMS will provide protection and management with regard to mining activities under all alternatives, but with greater effectiveness under Alternatives 2 through 6. Under the CHMS, mining will continue to result in the majority of impacts to this species and its habitat. As an important core habitat reserve under the CHMS, the recommended Blackhawk RNA is essential for a favorable viability outcome.

Under Alternatives 1, 4 and 5, protections for this species related to Land Use Zones would be limited to the existing Bighorn Mountains Wilderness. Under Alternatives 2, 3, 4a, and 6, designation of the

proposed Blackhawk RNA would provide essential protection, and would become a core habitat reserve under the CHMS. Alternatives 3, 4a and 6 would also include an SIA at Arrastre Creek. The Blackhawk RNA would protect 116 acres of occupied habitat, 524 acres of critical, and 1,295 acres of suitable habitat for this taxon. The Arrastre Creek SIA would protect 35 acres of occupied, 143 acres of critical, and 759 acres of suitable habitat.

Under Alternatives 3, 4a, and 6, additional areas of designated Backcountry Non-Motorized zoning would provide a modest increase in protection for this species. Under alternative 4a, a large swath of Back Country Motorized Use Restricted zoning would provide an improved level of protection.

Consideration of the Forest Plan and SBNF Place Standards related to threatened and endangered species, roads and recreation factor into these outcomes. The proposed Blackhawk RNA, where applied, is critical to these outcomes. Presumed implementation of the CHMS is fundamental to the outcomes.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	B	C	B

Private lands, mainly patented claims along the base of the north slope of the San Bernardino Mountains, are an important portion of this species' distribution and have been reduced by large-scale limestone mining. The habitat surrounding these mines continues to be lost as quarries are expanded. This loss on private lands is expected to be guided in the future by the CHMS and thus not expected to reduce the viability of the protected and managed occurrences on the SBNF. Habitat on BLM lands to the north of the SBNF will also be managed under the CHMS, so that all of this species' habitat will be managed under a single strategy across jurisdictional boundaries.

By maintaining the current distribution of *Acanthoscyphus parishii* var. *goodmaniana* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Acanthoscyphus parishii* var. *goodmaniana* to suffer a decline in its overall distribution.

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Acanthoscyphus parishii var.
cienegensis

Agrostis hooveri

Agrostis hooveri

Agrostis hooveri Swall. (Hoover's bentgrass)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Agrostis hooveri is a narrow endemic that historically occurred in Santa Barbara and San Luis Obispo counties, mostly in coastal hills around Vandenberg Air Force Base, Lompoc, Casmalia, Solomon Hills, Purisima Hills, upper Arroyo Grande watershed, upper West Fork Ballard Canyon, to San Luis Obispo/Los Osos area, eastward to east slope of Santa Lucia Mountains (CalFlora 2002, Hoover 1970, Smith 1998).

Distribution in the Planning Area

Within the province, there is one documented occurrence of *Agrostis hooveri* on Los Padres National Forest at Black Butte Research Natural Area (CalFlora 2002). Two other locations are either on or adjacent to National Forest System land on the Santa Lucia Ranger District. One is "near Rinconada" and the other is on or near Cuesta Ridge, possible southeast of Cuesta Summit (CalFlora 2002, Painter 2004). Collectively, these three reports suggest that *Agrostis hooveri* may occur elsewhere in this portion of the southern Santa Lucia Mountains. However, surveys of the Cuesta Ridge area did not result in the detection of *Agrostis hooveri* (Junak 1991a, 1991b) on National Forest System lands. In addition, a recent evaluation of habitat in and around Rinconada Mine did not result in the detection of any potential habitat (unpublished data on file, Los Padres National Forest, Frazier Park, Calif.). The substrates in and around Rinconada Mine are serpentine and this substrate is not known to be compatible with *Agrostis hooveri*. The collection of *Agrostis hooveri* from this area probably came from private land to the north where non-serpentine substrates are present.

Taxonomy and Natural History

Agrostis hooveri is a monocot in the grass family (*Poaceae*). This species is distinguished by its open inflorescence and spikelets near the end of branches with the lemma awned from below the middle.

Agrostis hooveri is a perennial bunch grass that blooms from April through July. The California Native Plant Society (2001) indicates that *Agrostis hooveri* is stoloniferous but both Hoover (1970) and Harvey (1993) indicate that the species does not have rhizomes or stolons.

Habitat Description

Agrostis hooveri is found in chaparral, oak woodland, closed-cone forest (Bishop pine), and annual grasslands on dry soils derived from sandstone or siliceous shale at an elevation of 20 to 2,000 feet (6 to 600 meters) (California Native Plant Society 2001, Harvey 1993, Hoover 1970, Smith 1998).

Occurrence Status

Agrostis hooveri is uncommon (Harvey 1993) and endangered in a portion of its range (California Native Plant Society 2001). According to Hoover (1970), *Agrostis hooveri* is locally plentiful in several places. However, many of the occurrences around Arroyo Grande, Pismo Beach, and the San Luis Obispo area have been extirpated by development and the same fate has befallen the occurrences known from Santa Barbara County. The status of *Agrostis hooveri* at Black Butte Research Natural Area is unknown.

Threats

Agrostis hooveri is threatened by development on private land. There are no known threats on National Forest System land. No land disturbing activities are currently occurring in the Black Butte Research Natural Area.

Conservation and Management Considerations

More information is needed on the Los Padres National Forest occurrence(s) of *Agrostis hooveri*. If plants are relocated on the Los Padres National Forest, efforts should be made to secure seed or living plants for use in the development of a conservation seed bank.

Evaluation of Current Situation and Threats on National Forest System Lands

Agrostis hooveri has a distribution that is peripheral to National Forest System lands, with only one confirmed occurrence found on the Los Padres National Forest. There are no apparent threats to this occurrence as this site is within a Research Natural Area and no land disturbing activities other than those associated with research are anticipated to occur.

Based upon the above analysis, *Agrostis hooveri* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Agrostis hooveri* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Agrostis hooveri* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Acanthoscyphus parishii var.
goodmaniana**

Allium hickmanii

Allium hickmanii

Allium hickmanii Eastwood (Hickman's onion)

Management Status

Federal: Forest Service Watch List; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Allium hickmanii is endemic to Monterey and San Luis Obispo counties from the Monterey Peninsula south to San Simeon (CalFlora 2002).

Distribution in the Planning Area

There are two known occurrences of *Allium hickmanii* on the Los Padres National Forest. One occurrence (Norman 1999) is found in the Salmon Creek Allotment. The second occurrence (California Native Plant Society 1999) is in an ungrazed pasture of the Pacific Valley Unit of the Gorda Allotment near Jade Cove. Both of these locations are on the Monterey Ranger District.

In addition, there is a substantial and unquantified amount of unsurveyed habitat for *Allium hickmanii* on the Monterey Ranger District.

Taxonomy and Natural History

Allium hickmanii is a perennial, bulb-bearing monocot in the lily family (Liliaceae) and flowers in April and May (California Native Plant Society 2001, McNeal 1993).

Habitat Description

Allium hickmanii grows in closed-cone coniferous forest, chaparral (maritime), coastal prairie, coastal

scrub, and valley and foothill woodland. Microsite characteristics are sandy loam to deep clay soil on damp ground and vernal swales, mostly in grassland (California Natural Diversity Database 2004, Keil and McLeod 1987). Some occurrences are found on thin soil atop bedrock materials such as granite or serpentine (California Natural Diversity Database 2004). The elevation range for *Allium hickmanii* is 65 to 600 feet (20-185 meters) (California Native Plant Society 2001).

Several occurrences [California Natural Diversity Database (CNDDDB) #s 1, 2, 14] in the Monterey Peninsula/Carmel Valley area appear to still be extant, while many others (CNDDDB #s 5, 6, 8, 9, 13, 17, 18, 19, 20, 21, 22, 23, and 24) are reported to be threatened by development, road construction, and intensive land uses such as open pit mining and military training (California Natural Diversity Database 2004). Many of these occurrences may no longer exist due to habitat loss.

In the San Simeon/Arroyo de la Cruz area, CNDDDB Occurrences 3, 7, 10, 11, 16 and 25 are located on private rangelands and appear to be secure under this land use (see Population Status).

Habitat near Salmon Creek does not appear degraded based on two field visits in 2000 and 2002. A visit to the single occurrence near Jade Cove in 2003 also found habitat in good condition.

Occurrence Status

There is little data available on current trends in population abundance and distribution. Norman (1999) reported that there were about 200 plants in a less than 400 square-foot area of coastal terrace at Jade Cove.

Matthews (1997) reports that *Allium hickmanii* is rare in Monterey County.

In the San Simeon/Arroyo de la Cruz area, *Allium hickmanii* sometimes occurs in large colonies and the total number of plants present likely exceeds 20,000 individuals (Keil and McLeod 1987).

OCCURRENCE DATA of *Allium hickmanii* (*Hickman's onion*)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County

1	U	> 1000 in 1985, 1993	1985	VETERANS MEMORIAL PARK ABOVE MONTEREY, SOUTH SIDE OF SKYLINE DRIVE, MONTEREY PENINSULA. NEAR SOUTH ENTRANCE AND SKYLINE RIDGE SUBDIVISION, T18S/ R01W/S25	MON
2	U	U	1976	SOUTH OF MONTEREY AIRPORT AND NORTHEAST OF JACKS PEAK COUNTY PARK, MONTEREY PENINSULA. MAPPED ALONG RIDGE ABOUT 0.7 MILE SW OF JUNCTION OF HIGHWAY 68 AND HIGHWAY 218 AND 0.8 MILE ESE OF FOOTHILL SCHOOL, T16S/R01E/S03	MON
3	U	U	1983	NEAR MOUTH OF ARROYO DE LA CRUZ (JUST SOUTH OF) ON MESA SUMMIT, NORTH OF SAN SIMEON. MAPPED ALONG RIDGE ON SOUTH SIDE OF ARROYO, EAST OF HIGHWAY 1, T26S/R06E/ S02	SLO

5	U	U	1985	NORTH OF CARMEL MISSION BETWEEN HATTON ROAD AND MARTIN ROAD, CARMEL, MONTEREY PENINSULA. ON THE NORTH SIDE OF THE WEST END OF MARTIN ROAD, ALONG BOUNDARY WITH CARMEL-BY-THE-SEA, T16S/01W/S12	MON
6	U	1000+ in 1985	1985	EAST SIDE OF HIGHWAY 1 AT CARPENTER ROAD, CARMEL, MONTEREY PENINSULA. MAPPED ALONG EITHER SIDE OF CARPENTER ROAD JUST EAST OF HIGHWAY, T16S/R01W/S01	MON
7	U	U	1983	RIDGE S OF ARROYO DE LA CRUZ, JUST W & NW OF VABM CINNABAR. MAPPED AS FOUR POLYGONS AT CNDDDB, MOSTLY BASED ON WALTERS AND BURDETT, 1983 MAP, T25S/R06E/S36	SLO

8	U	800-1200 in 1983, < 100 in 1983	1983	<p>PRESIDIO OF MONTEREY, NORTHWEST OF VETERANS MEMORIAL PARK, MONTEREY PENINSULA.</p> <p>MONTEREY PRESIDIO NEAR NE BASE OF 775 FT KNOLL; APPROX 300 FT SOUTHWEST OF WEST CORNER OF PARKING LOT OF EXISTING LARGE BARRACKS COMPLEX., T18S/R01W/S24</p>	MON
9	U	U	1988	<p>WEST OF HUCKLEBERRY HILL AT JUNCTION OF LOPEZ ROAD AND SUN RIDGE ROAD, PEBBLE BEACH, MONTEREY PENINSULA. PLANTS FOUND IN SOUTHWEST AND NORTHWEST CORNERS OF THE JUNCTION OF THE TWO ROADS.</p> <p>GRIGGS POPULATION #2,3 FROM 1988 SURVEYS, T18S/R01W/S35</p>	MON
10	U	< 10000 in 1983	1983	<p>ABOUT 0.25 MILE EAST OF BM 31 ON HIGHWAY 1, JUST NORTH OF ARROYO DE LA CRUZ, T25S/R06E/S34</p>	SLO

11	U	< 1000 in 1983 & < 10000 in 1985 in a larger area	1985	NORTH & SOUTH SIDES OF ARROYO DE LOS CHINOS, NEAR YELLOW HILL. MAPPED AS ELEVEN POLYGONS IN VICINITY OF YELLOW HILL; NEED GRAPHICS TO APPRECIATE, T25S/ R06E/S26	SLO
13	U	> 10,000 in 1985	1985	CARMEL KNOLLS DRIVE NORTH OF CARMEL VALLEY ROAD, CARMEL, MONTEREY PENINSULA. SEVERAL COLONIES MAPPED AS FOUR POLYGONS ALONG RIDGE BETWEEN CARMEL KNOLLS DRIVE AND HATTON CANYON; EAST OF PROPOSED HIGHWAY 1 REALIGNMENT, T16S/ R01E/S07	MON
14	U	> 100+ in 1985	1985	NORTH SIDE OF CARMEL VALLEY ROAD ABOUT 0.9 MILE EAST OF HIGHWAY 1, CARMEL VALLEY. MAPPED ABOUT 300 FEET NORTH OF CARMEL VALLEY ROAD, ACROSS FROM THE RANCHO CANADA GOLF CLUB, T16S/R01E/ S18	MON

15	U	U	U	NEAR JOLON.	MON
16	U	50-100 in 1985	1985	RIDGE BETWEEN ARROYO DEL CORRAL AND ARROYO LAGUNA, ABOUT 1.5 AIR MI NORTH OF OAK KNOLL, NW OF SAN SIMEON, T26S/R07E/S08	SLO
17	U	150+ in 1988	1988	<p>NORTHEAST OF PEBBLE BEACH EQUESTRIAN CENTER ALONG OLEADA ROAD AND FOREST LAKE ROAD, PEBBLE BEACH, MONTEREY PENINSULA.</p> <p>THREE COLONIES IN THIS VICINITY: ONE JUST EAST OF JUNCTION OF OLEADA ROAD AND RHONDA ROAD;</p> <p>TWO COLONIES WEST OF FOREST LAKE ROAD JUST SOUTH OF DRAKE COURT. GRIGGS POPULATION #5, 6</p> <p>FROM 1988 SURVEYS, T18S/R01W/S34</p>	MON

18	U	U	1985	MACHINE GUN FLATS, SOUTHWEST OF EAST GARRISON AT FORMER FORT ORD MILITARY RESERVATION, T15S/R02E/S09	MON
19	U	200+ in 1988	1988	ALONG PESCADERO CREEK JUST SOUTH OF JUNCTION OF DEL CIERVO ROAD AND SEVENTEEN MILE DR, PEBBLE BEACH, MONTEREY PENINSULA. ALONG WEST SIDE OF CREEK ABOUT 1000 FEET SSW OF ROAD JUNCTION, T16S/R01W/S01	MON
20	U	< 10 in 1988	1988	ABOUT 0.5 MILE SOUTHWEST OF HUCKLEBERRY HILL, EAST OF SUNRIDGE ROAD, PEBBLE BEACH, MONTEREY PENINSULA. MAPPED BETWEEN SUNRIDGE ROAD AND SOUTH END OF COSTANILLA WAY. GRIGGS POPULATION #1. FROM 1988 SURVEYS, T18S/R01W/S35	MON

21	U	100+ in 1988	1988	<p>ABOUT 0.4 MILE SOUTH OF FOREST LAKE, BETWEEN LOPEZ ROAD AND VIZCAINO ROAD, PEBBLE BEACH, MONTEREY PENINSULA. NORTHEAST OF VIZCAINO ROAD ALONG DIRT SERVICE ROAD. SITE IS IN LARGE CLEARING EAST OF ROAD ABOUT 100'-200' AFTER CROSSING SEAL ROCK CREEK. GRIGGS POPULATION #4 FROM 1988 SURVEYS, T18S/R01W/S34</p>	MON
22	U	1000 in 1988	1988	<p>ABOUT 1 MILE SSW OF HUCKLEBERRY HILL, NORTH OF SONADO ROAD BETWEEN SPRUANCE ROAD AND VIZCAINO ROAD, MONTEREY PENINSULA. POPULATION BOUNDED TO THE SOUTH BY SPRUANCE ROAD, GRIFFEN ROAD TO NW, AND TO THE NORTH BY THE REAR LOT LINES OF HOMES LOCATED ON SUNRIDGE ROAD. GRIGGS POPULATION #7 FROM 1988 SURVEYS, T16S/R01W/S02</p>	MON

23	U	1000-1500 in 1994	1994	TARPY FLATS, NNE OF JACKS PEAK COUNTY PARK AND EAST OF FOOTHILL SCHOOL, MONTEREY PENINSULA. MAPPED SOUTH OF HIGHWAY 68 AND ABOUT 0.5 MILE EAST OF FOOTHILL SCHOOL, T16S/R01E	MON
24	U	U	1989	SOUTHEAST OF EAST GARRISON ABOUT 0.7 MILE WEST OF RESERVATION ROAD AT DAVIS ROAD, FORMER FORT ORD MILITARY RESERVATION. ALONG SOUTH SIDE OF CRESCENT BLUFF ROAD, T15S/R02E/S11	MON
25	U	1000+ 1999	1999	ADOBE CREEK, ABOUT 1-2 MILES UPSTREAM FROM HIGHWAY 1, WEST OF SAN SIMEON. 5 COLONIES MAPPED ON RIDGE ALONG EAST SIDE OF ADOBE CREEK, JUST WEST OF PRIVATE ROAD. SEE AP FOR DETAIL, T26S/R07E/S17	SLO

- *U = Unknown.*
- ** = an occurrence number has not been assigned.*
- MON= Monterey County
- SLO= San Luis Obispo County

Threats

The California Native Plant Society (2001) states that *Allium hickmanii* is endangered in portions of its range and that urbanization, grazing, road construction, and military activities threaten the taxon. As described above, many plants have probably been lost due to urbanization in the Monterey Peninsula/Carmel Valley area.

On National Forest System land, grazing is the primary threat to *Allium hickmanii* along with dispersed recreation and noxious weeds, primarily Kikuyu grass (*Pennisetum clandestinum*). On privately owned rangelands near Arroyo de la Cruz, grazing intensity is light to moderate and under light grazing pressure *Allium hickmanii* was reported to be present in large numbers (Keil and McLeod 1987) indicating a degree of tolerance to this type of land use.

Conservation and Management Considerations

Allium hickmanii appears to be a habitat generalist in terms of vegetation associations but a specialist in terms of microhabitat; i.e., the plant is generally found in vernal moist sites in grasslands, woodlands, and chaparral. Vernal moisture appears to be provided by different sources at different sites including having clay as a significant component of the site's soil. Some occupied habitats are in vernal swales, near seeps, or above hardpans. All of these habitat components are difficult to map at the scale of Forest Planning. Therefore, project specific surveys could be considered when projects occur within the range of this species.

Hoover (1970) notes that *Allium hickmanii* plants are small and largely hidden by surrounding grass. This characteristic needs to be considered when developing survey protocols.

Consider monitoring the two occurrences of *Allium hickmanii* found on National Forest System land and if needed use measures to redirect or control foot or livestock traffic. Consider monitoring invasive nonnative plants in *Allium hickmanii* habitat to determine whether there is a need for integrated pest management.

Evaluation of Current Situation and Threats on National Forest System Lands

Allium hickmanii is not common nor is it widely distributed on National Forest System land. One of two known occurrences is located in an area subject to livestock grazing (Salmon Creek Allotment) and the other is on a popular coastal terrace where foot traffic from dispersed recreationists could impact plants and habitat. The spread of noxious weeds at this latter site is also of concern.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Current information on the distribution of *Allium hickmanii* indicates that its distribution is peripheral to National Forest System land as only two occurrences out of 25 are found on National Forest System land. These occurrences are located in the middle of the taxon's range. The proposed grazing at Cozy Cove, Salmon Creek, San Carpoforo and Jade Cove has been analyzed to be of low intensity. This taxon has persisted over time at six locations on private rangelands in the San Simeon/Arroyo de la Cruz area suggesting that it is capable of maintaining sustainable populations under light to moderate intensity grazing regimes. Because of the remote location occupied by the population at Salmon Creek it has a low risk of being extirpated by a combination of grazing, recreation impacts, and stochastic events.

Under all alternatives, the Salmon Creek population would be in a Back Country land use zone. Except for Alternative 1, the Jade Cove population of *Allium hickmanii* would be located in a Developed Area Interface land use zone. Because the Jade Cove population is small and occurs in an area that experiences high recreation use it is considered to have a moderate risk of being extirpated during the next 50 years, and this risk would be the same under all alternatives. *Allium hickmanii* at Jade Cove is also threatened by Kikuyu grass and other non-native plants, but none of these threats are currently affecting the existing stand of *Allium hickmanii*. These threats may be imminent, or they may remain latent, or they may even decrease. There are no land use zone changes between Alternative 4 and 4a in Hickman's onion locations on the Forest. One of the stressors, dispersed recreation would be managed for better control in alternatives 4 and 4a, with more emphasis on dealing with the current issues before expanding opportunities in alternative 4a. In this sense, Alternative 4a may help the viability of Hickman's onion, but only on the Pacific Valley site, so the viability outcome for alternative 4a would not differ from Alternative 4 or any other alternative.

Only time and site-specific monitoring can determine the degree of threat posed by human uses of occupied habitat and this type of monitoring is equally likely to occur under all alternatives. Because there are only two known occurrences of *Allium hickmanii* to monitor on the Los Padres National Forest and since both of these occurrences are within 30 minutes of paved road access there is a moderate likelihood that monitoring would occur sufficiently often to allow the detection of any downward trends in abundance. Early detection of downward trends in abundance would trigger a need to change management practices in such a way as to halt and/or reverse the decline in species abundance. There is a low likelihood that such monitoring would not detect downward trends in abundance and there is also a low likelihood that such monitoring would only detect downward trends in abundance only after it is

too late to recover the declining population.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

Due to urbanization, grazing, road construction, and military activities on non National Forest System lands, additional occurrences of *Allium hickmanii* may be lost and habitat degraded. As described above, many plants have already been lost due to urbanization in the Monterey Peninsula/Carmel Valley area. The historic range of *Allium hickmanii* has been substantially fragmented.

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Agrostis hooveri

Allium howellii var. clokeyi

Allium howellii var. clokeyi

Allium howellii Eastwood var. *clokeyi* Ownbey & Aase ex Traub (Mount Pinos onion)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3T3 S2.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Allium howellii var. *clokeyi* is found in the western Transverse Range of Los Angeles County (Castaic Canyon) and in Ventura and Santa Barbara counties (California Native Plant Society 2001). *Allium howellii* var. *clokeyi* is also reported from the San Bernardino Mountains (Utech 2002) but the reporting of this location may be in error.

Distribution in the Planning Area

Allium howellii var. *clokeyi* occurs at numerous locations on the Los Padres National Forest including Hurricane Deck, Ballinger Canyon, upper Quatal Canyon, and most of the other canyons of the upper Cuyama River watershed, east to Lockwood Valley and the headwaters of Piru Creek (CalFlora 2002, Smith 1998). *Allium howellii* var. *clokeyi* is also reported from the middle reaches of Piru Creek near Hardluck Campground (Burgess 2003).

Taxonomy and Natural History

Allium howellii var. *clokeyi* is a monocot in the lily family (Liliaceae). *Allium howellii* var. *clokeyi* is separated from the more common and widely distributed Howell's onion (*Allium howellii* var. *howellii*) by generally larger stems (8–24 inches [20–60 centimeters] tall), more numerous flowers (> 50) that are white and bloom in the early summer, and by ovary crests that are white or green.

Allium howellii var. *clokeyi* is a perennial bulb that reproduces by seed and by the production of

daughter bulbs.

Habitat Description

Allium howellii var. *clokeyi* is found growing in openings of sagebrush scrub and pinyon/juniper woodland at elevations of 4,265–6,070 feet (1,300–1,850 meters). Soils are 'loamy' at Ballinger Canyon (Smith 1998), but Mount Pinos onion is typically found on Lockwood clay and the loamy soils at Ballinger Canyon may also be Lockwood Clay. Near Hardluck Campground, *Allium howellii* var. *clokeyi* grows in a seepy area with soils that are more-or-less saline (Burgess 2003). *Allium howellii* var. *clokeyi* is also reported to occur on serpentine soils (Utech 2002).

Occurrence Status

Allium howellii var. *clokeyi* is found in scattered colonies at about a dozen locations (CalFlora 2002, Smith 1998). Many of these colonies are fairly large, covering tens of acres and numbering in the hundreds and perhaps thousands (personal observation; Burgess 2003).

Threats

Allium howellii var. *clokeyi* is threatened by mining for Lockwood clay, hoof impacts from grazing livestock, trampling by off-highway vehicle trespass, trampling from dispersed recreation use, and road maintenance. The magnitude of these threats is not large – most areas where *Allium howellii* var. *clokeyi* occurs are not within grazing allotments or next to off-highway vehicle routes - and the plants distribution has not been affected except for the loss of habitat to mining of Lockwood Clay. The amount of habitat that has been subject to mining is roughly estimated at about 100 acres.

Grazing has a only a minor effect on *Allium howellii* var. *clokeyi* for this reason: on the Ballinger Canyon, Burges, Dry Canyon, Piru, and Wegis Allotments, by the time grasses cure and livestock begin to search out other forms of forage *Allium howellii* var. *clokeyi* has become completely senescent and is not desirable forage. *Allium howellii* var. *clokeyi* also occurs in open habitats that are sparsely vegetated and offer little attraction to foraging livestock.

Off-highway vehicle use has resulted in some lost habitat due to trail construction and use but the amount of lost habitat is not large as trail builders typically avoid Lockwood Clay as much as possible due to the problems it creates for trail maintenance and use. Some impacts from off-highway vehicle trespass result in short-term impacts to habitat and occasionally to plants. However, most volunteer trails are short in duration and short-lived on the landscape. The clay soils dissuade most trespass, and the natural shrink-swell of the soil over a period of time soon masks the sign of much of the unauthorized use. In a few, small areas, off-highway vehicle use results in the development of rill erosion and small gullies in *Allium howellii* var. *clokeyi* habitat.

There are many acres of *Allium howellii* var. *clokeyi* that are not affected by any land use.

Conservation and Management Considerations

Consider continuing to track distribution and threat information on this taxon.

Evaluation of Current Situation and Threats on National Forest System Lands

Based upon the above analysis this species has been assigned the following threat category:

3. Common or widespread in plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Allium howellii* var. *clokeyi* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Allium howellii* var. *clokeyi* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Allium hickmanii

Allium marvinii

Allium marvinii

Allium marvinii Davidson (Yucaipa onion)

Management Status

Federal: None

California: None

Heritage Rank: G1; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

There are only two known occurrences, both in the Yucaipa and Beaumont area of the southern San Bernardino Mountains. Only one of these occurrences is known to be extant.

Distribution in the Planning Area

There are no known occurrences within the planning area. Occurrence # 1 is within the congressional boundary of the San Bernardino National Forest, but it is under private ownership.

Taxonomy and Natural History

Allium marvinii is a perennial bulbiferous herb that blooms April-May. This species is a monocotyledonous plant in the lily family (Liliaceae) (California Native Plant Society 2001).

There is uncertainty about the distribution and taxonomic classification of *Allium marvinii*. The Jepson Herbarium reports that *Allium marvinii* may be distinct from *Allium haematochiton*, but does not list it as an accepted taxon. The California Native Plant Society (2001) and the California Natural Diversity Database (2004) recognize *Allium marvinii* as a valid and distinct taxon.

Allium marvinii is 2-3 dm high. The bulb is oblong, tunicate and has a rough outer brown coat and a smooth and glistening inner white coat. There are 5-6 leaves that are all basal and one-half the length of the stem. The leaves are somewhat fleshy, concave-convex, 5-8 mm wide at the base, and semiterete at

the apex. There are two or more stems that are slightly angular below and terete above. There are 12-20 or more pedicels that are 15 mm long. The perianth is 5 mm long, dull white with a brown stripe, fading to lavender, with ovate segments, stamens widening a little below, exceeding the perianth, and an undivided stigma with 6 crests crowned with the remnants of a cellular ridge of oblong cells that are very conspicuous during inflorescence (Davidson and Comstock 1921).

Plants have white flowers with a green midrib and 3-4 leaves per stem. The ovary has distinct wing-like crests. There is no red in the bulb coat.

Habitat Description

Allium marvinii occupies clay openings in chamise chaparral between 760-1065 m.

Clay openings in chaparral are narrowly restricted within the Province. In general, chaparral habitats are threatened by altered fire regimes. Fire suppression has prolonged the period between fires; however, when fires occur, they tend to be catastrophic.

Suitable habitat for this species exists within a group of isolated parcels of National Forest System land east of Yucaipa, and possibly on San Bernardino National Forest above Oak Glen and onto Yucaipa Ridge.

Occurrence Status

There are only two known occurrences of *Allium marvinii*, neither on National Forest System land. There is no information on population size or trends.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Allium marvinii* (Marvin's onion)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1993	E side of Water Canyon, SW foot of Pisgah Peak, Porter Ranch. San Bernardino Mountains. PVT.	SBD

2	U	1921	Hill E of Beaumont (non-USFS). Exact location unknown. Type locality. Needs fieldwork. Land ownership: U	SBD
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- *U = Unknown*
- *SBD = San Bernardino County*
- *PVT = Private Property*

Threats

The extremely narrow distribution of *Allium marvinii* increases its susceptibility to extinction from stochastic events. Both occurrences may be threatened by development or other private land uses.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Allium marvinii*:

- Survey areas of clay soils on National Forest System land along the foothills between Yucaipa and Banning.
- Survey any new occurrences of *Allium marvinii* on National forest System land, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Allium marvinii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Allium marvinii* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Allium marvinii is an extreme narrow endemic species that is currently known only from two occurrences in the Banning Pass area. The occurrences are near the San Bernardino National Forest, and suitable habitat near these localities exists on the San Bernardino National Forest.

Based on this analysis, *Allium marvinii* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Allium marvinii* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Allium marvinii*.

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Allium howellii var. clokeyi

Allium munzii

Allium munzii

Allium munzii (Traub) D. McNeal (Munz's onion)

Management Status

Federal: Endangered (63 FR 54975, 13 October 1998); Critical Habitat designated June 7, 2005 (U.S. Fish and Wildlife Service 2005).

California: Threatened (California Natural Diversity Database)

Heritage Rank: G1 S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

Critical Habitat (CH) for *Allium munzii* was proposed by the USFWS on June 4, 2004 (69 Federal Register 31569) (U.S. Fish and Wildlife Service 2004). In determining which areas to designate as CH the USFWS considers those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These features are termed Primary Constituent Elements (PCEs) and they are summarized in the proposed rule (69 FR 31569). A final rule to designate Critical Habitat for *Allium munzii* was made on June 7, 2005 (70 Federal Register 33015) (U. S. Fish and Wildlife Service 2005).

General Distribution

Allium munzii, Munz's onion, is endemic to the Santa Ana and Elsinore Mountains and Gavilan Hills of western Riverside County in the northwest Peninsular Ranges (California Natural Diversity Database 2004). Five populations occur in the Gavilan Hills: three on private lands, one at Harford Springs County Park, and one on land managed by the Riverside County Habitat Conservation Agency. Other populations occur on private lands in the Temescal Valley, north of Walker Canyon, and in or near the Paloma Valley. Some locations in the Paloma Valley are managed by the Reserve Management Committees (Domenigoni Hills and Bachelor Mountain) for the Riverside County multispecies plan (Stephenson and Calcarone 1999).

Distribution in the Planning Area

Within the southern California National Forest System lands, *Allium munzii* is only known from the

Cleveland National Forest (CNF). This occurrence is located on Elsinore Peak in the Santa Ana Mountains.

Taxonomy and Natural History

Allium munzii is an herbaceous perennial from a small, ovoid, reddish bulb about 10-15 mm diameter. Inner coats of the bulb are pale brown, white or pink. Plants are about 10-25 cm high with a single leaf, which is round in cross-section. *Allium munzii* flowers from April through May, and flowers are white (red in fruit). The perianth length is 6-8 mm, entire with mid-veins sometimes pink to green. The ovary crests are 6, prominent, finely and irregularly dentate. *Allium munzii* is phenotypically similar to other onions. It is closely related to fringed onion (*A. fimbriatum*) and was once considered a variety of that species. *Allium munzii* can be distinguished from other congeners by its solitary cylindric leaves, the elliptic to ovate and white perianth, and finely to irregularly dentate ovary crest (McNeal 1992, Hickman 1993). Perennial bulbs may produce leaves and flowers or only leaves in a given year depending on precipitation.

Hybridization is not apparent on Elsinore Peak where *Allium munzii* is sympatric with other *Allium* species (Boyd and Mistretta 1991).

Habitat Description

Allium munzii is associated with clay soils; outcrops of intrusive volcanic, metasedimentary, or gabbro rocks with mesic exposure; marine or non-marine sediments with mesic exposure; and bench or terrace topography in the presence of grassland surrounded by scrub vegetation (USDA Forest Service 1992). It often occurs near the ecotone of grassland and chaparral in more mesic sites (Boyd and Mistretta 1991). Other vegetation types include chaparral, coastal sage scrub, cismontane woodlands, pinyon-juniper woodlands, and valley/foothill grasslands at elevations of 975 to 3,500 feet (300–1,070 meters) (Boyd and Mistretta 1991, California Native Plant Society 2001). It also grows in mesic grasslands (e. g., southern needlegrass grassland), vernal pools and other wetlands, and, in the Gavilan Hills, with California juniper (*Juniperus californicus*) (Stephenson and Calcarone 1999). *Allium munzii* is typically associated with Alo, Altamont, Bosanko, or Auld soils and typically occurs on shallow slopes (USDA Forest Service 1992). Associated species include *Camissonia graciliflora*, *Harpagonella palmeri* and *Fritillaria biflora*.

Occurrence Status

The California Natural Diversity Database (CNDDB) lists 19 occurrences, three of which are presumed extirpated (California Natural Diversity Database 2004). Most occurrences are located on private or unknown ownership lands (12 or 92% of the known extant occurrences). Two of these occurrences are located on both publicly protected and private lands. Five populations have over 2000 individuals, covering approximately 20 acres. Other populations are smaller in area from a square yard to less than 2.5 acres with fewer than 1,000 plants (U.S. Fish and Wildlife Service 1998). The remaining location is

on Elsinore Peak within the Cleveland National Forest. This occurrence is the highest elevation recorded for *Allium munzii* and may be the least disturbed population throughout its range (Boyd and Mistretta 1991). The U.S. Fish and Wildlife Service estimates between 20,000 to 70,000 total individuals within the range of *Allium munzii* (U.S. Fish and Wildlife Service 1998). However, population numbers vary from year to year, fluctuating with annual rainfall.

OCCURRENCE DATA of *Allium munzii* (Munz's onion)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
1	U	U	1930	ALONG LAKE MATTHEWS ROAD, ABOUT 0.5 MILE WEST OF JUNCTION WITH GAVILAN ROAD, GAVILAN PLATEAU, T04S/R05W/S26	RIV
2	U	5000+ in 1986, 6700 in 1989, and 1990, 4000 in 1992, 45200 in 1993, 28,980 in 1994 and 50,994 in 1995. 5000- 2000 in 1998	1998	HARFORD SPRINGS COUNTY PARK ALONG SOUTH BORDER AND ON HILL ACROSS IDA- LEONA RD, GAVILAN PLATEAU. ALSO IN SECTION 24. PLANTS WITHIN THE COUNTY PARK ARE PRESERVED WITHIN A NATURAL AREA, T04S/ R05W/S25	RIV

3	U	U	1982	JUNCTION OF I-15 AND INDIAN TRUCK TRAIL, TEMESCAL CANYON, TEMESCAL VALLEY, T05S/R06W/S12	RIV
4	U	50-75 in 1986	1986	SKUNK HOLLOW, ABOUT 2.25 AIR MILES EAST OF MURIETTA HOT SPRINGS AND 0.5 MILE SOUTH OF TUCALOTA CREEK. "SKUNK HOLLOW" POPULATION.	RIV
5	U	> 2000	1986	GAVILAN HILLS, SOUTH FLANK OF UPPER DAWSON CANYON, T04S/R05W/S33	RIV
6	U	< 1000 in 1982, 150-200 in 1986	1986	SOUTH SLOPE OF ALBERHILL MOUNTAIN, DIRECTLY ADJACENT TO OPEN PIT CLAY MINES. ALSO IN SEC. 23 AND 27. 1986 LETTER BY BOYD INDICATES THIS POP WAS COMP. OF 3 COLONIES AND HAS BEEN REDUCED TO 1 STAND, T05S/R05W/S26	RIV

7	U	> 1000 in 1986, U in 2000	2000	<p>SOUTH SLOPE OF ALBERHILL MOUNTAIN, DIRECTLY ADJACENT TO OPEN PIT CLAY MINES.</p> <p>ALSO IN SEC. 23 AND 27. 1986 LETTER BY BOYD INDICATES THIS POP WAS COMP. OF 3 COLONIES AND HAS</p> <p>BEEN REDUCED TO 1 STAND, T05S/R05W/S18</p>	RIV
8	U	1000 in 1986	1986	<p>TEMESCAL VALLEY, JUST W OF MOUTH OF INDIAN CANYON. JCT OF INTERSTATE 15 AND INDIAN</p> <p>TRUCKTRAIL, T05S/R06W/S12</p>	RIV
9	U	> 2000	1986	<p>NORTHWEST OF SUMMIT OF ESTELLE MOUNTAIN, GAVILAN HILLS, T05S/R05W/S05</p>	RIV
10	U	441 in 1991	1991	<p>NORTH DOMENIGONI HILLS, 0.5 AIRMI SOUTHEAST OF WARREN ROAD.</p> <p>ADJACENT TO AN OLD QUARRY AREA, ON EITHER SIDE OF THE OLD MINE RD. T05S/R01W/S31</p>	RIV

11	U	700 in 1989-90, 202 in 1992, 3343 in 1993, 549 in 1994, 4373 in 1995	1998	LAKE SKINNER, ON SOUTH-FACING SLOPE OF BACHELOR MOUNTAIN. ALONG MAINTENANCE ROAD ON NORTH SIDE OF RESERVOIR, ABOUT 1 MILE EAST OF DAM. THREE POPULATIONS NOTED BY ELLSTRAND, T07S/R02W/S02	RIV
12	U	150 in 1989	1989	SOUTHWEST SLOPE OF BACHELOR MOUNTAIN, 0.7 MILE EAST OF WASHINGTON AVE, NORTH OF LAKE SKINNER, T06S/R02W/S34	RIV
13	2-1	1,000 to 5,000	1991	ELSINORE PEAK, FROM SUMMIT, S-WARD TO TRUCK TRAIL. ALSO IN T6S, R5W, SW PORTION OF SECTION 31, T06S/R04W/S36	RIV

14	U	1000 in 1992	1992	<p>JUST WEST OF LINDENBERGER ROAD, 0.8 MILE SOUTH OF SCOTT ROAD AND 0.4 MILE WEST OF BRIGGS RD, SSE OF SUN CITY, T06S/R03W/S24</p>	RIV
15	U	Sev'l thousand in 1993	1993	<p>NORTH OF LAKE ELSINORE, NORTH PEAK POPULATION.</p> <p>SITE MAPPED ABOUT 0.75 MILE NNE OF BENCHMARK 1423 ON HIGHWAY 74, T05S/R04W/S20</p>	RIV
16	U	300 in 1993, 3000 in 2003	2003	<p>NORTHEAST OF ALBERHILL, 0.9 MILE NORTH OF CORONA FREEWAY.</p> <p>SEVERAL COLONIES MAPPED IN THIS VICINITY. PLANTS JUST ABOVE POWERLINE ROAD (NOT SHOWN ON TOPO), ABOUT 0.2 MI W OF INTERSECTION WITH MAPPED ROAD. FOUND IN VARIOUS LOCATIONS IN S1/2</p> <p>SEC 11 AND NW1/4 SEC 14, T05S/R05W/S11</p>	RIV

17	U	2 in 1999	1999	<p>BACHELOR MOUNTAIN.</p> <p>SITE LOCATED ON NORTH FACING SLOPE OF BACHELOR MOUNTAIN 1,000' NW OF THE SUMMIT AND 2,000' SOUTH OF JUDITH STREET, T06S/R02W/S35</p>	RIV
18	U	U	2000	<p>WARM SPRINGS VALLEY, 0.8 AIRMILE WNW OF NORTH ELSINORE.</p> <p>LOCATION DESCRIBED AS ALBERHILL MARSH, T05S/R05W/S36</p>	RIV
20	U	U	1930	<p>GAVILAN PEAK.</p> <p>EXACT LOCATION UNKNOWN. SITE MAPPED AS PEAK, T04S/R05W/S23</p>	RIV

21	U	U	1897	WINCHESTER. EXACT LOCATION KNOWN MAPPED IN VICINITY OF WINCHESTER, T05S/ R02W/S21	RIV
27204 (UCR)	U	U	1982	Temescal Cyn. At Indian Truck Trail (De Palmas Rd.) Lat:33 ° 45'N/Lon:117 ° 27'W (LaPre/UCR) // De Palmas Rd. between Indian Truck Trail & Horsethief Cyn., 1.2 mi. E of the Indian Truck Trail exit of Hwy I-15, T5S/R5W/S7 (Boyd/UCR)	RIV
42166 (UCR)			1986		
22054 (UCR)	U	U	1980	Harford Springs County Park, NW corner of the Gavilan plateau, T4S/R5W/S24, elev. 2050 ft. (Boyd/UCR)	RIV
42165 (UCR)	U	U	1986	Gavilan Hills, summit of Estelle Mountain, T5S/R5W/ S5/NE ¼ of NW ¼ (Boyd/ UCR)	RIV
77592 (UCR)	U	U	1991	Santa Ana Mts., S side of Elsinore Peak, T6S/R5W/S36/ E ½ of SW ¼, elev. 3400- 3500 ft. (Boyd/UCR)	RIV
77571 (UCR)	U	U	1991	SE end of Gavilan Hills, E of Arroyo del Toro, N-facing slope of low hill, 5S/R4W/ S20, elev.1600 ft. (Boyd/ UCR)	RIV

68042 (UCR)	U	U	1991	Ca. 0.5 mi. SE of end of Warren Rd., on large prominent peak adjacent to old quarry, E of access Rd., T5S/R1W/S31/SE ¼ of NW ¼, elev. 2140-2160 ft.	RIV
42430 (UCR)	U	U	1986	Gavilan Hills, Hillside S of Harford Springs County Park, T4S/R5W/S25/NE ¼ of NE ¼, elev. 2020ft. (Boyd/UCR)	RIV
42167 (UCR)	U	U	1986	Gavilan Hills, E edge of plateau remnant of ridge E of Estelle Mountain, S of Dawson Cyn., T4S/R5W/S33, elev. 2200ft. (Boyd/UCR)	RIV
63945 (UCR)	U	U	1989	Lake Skinner, N of the lake on the S-facing slope of Bachelor Mountain, T7S/R2W/S2, elev.1490 (Bramlet/UCR)	RIV
79363 (UCR)	U	U	1992	Paloma Valley, between Sun City and Murrieta, E of Hwy 215, just SW of the jct. Of Briggs Rd. and Scott Rd., T6S/R3W/S24, elev.1500 (Boyd/UCR)	RIV
78048 (UCR)	U	U	1993	N Alberhill Ranch, in hills N of Walker Cyn., T5S/R5W/S15, elev. 1600 ft. (White/UCR)	RIV

42428 (UCR)	U	U	1986	Temescal Cyn., S slope of Alberhill Mountain, T5S/R5W/S26, elev.1400 ft. (Boyd/UCR)	RIV
42423 (UCR)	U	U	1986	Skunk Hollow area, E of Murrieta Hot Springs, on N base of Hill just to the W of Skunk Hollow, T7S/R2W/S17, elev.1440 ft. (Boyd/UCR)	RIV
94487 (UCR)	U	U	1982	Temescal Cyn., W of Horsethief Wash, S of Lee Lake on terrace escarpments just S of DePalma Rd., T5S/R5W/S18, elev.1300 ft. (Boyd/UCR)	RIV
114758 (UCR)	U	U	1999	Ridgetop, N,W, & NW facing slopes of Bachelor Mt., T6S/R2W/S35, elev.1800-25 ft. (White/UCR)	RIV
120806 (UCR)	U	U	2000	0.9 mi. SE of Indian Truck Trail and 30m S of DePalma Rd., T5S/R5W/S18, elev.1400 ft. (Gillespie/UCR)	RIV
144117 (UCR)	U	U	2000	Lake Elsinore area, low hill W of intermittent channel (drains Walker Cyn.) SW of Collier Ave. and NW of Riverside Dr., T5S/R5W/S36, elev.1250-1350 (White/UCR)	RIV

- *U = Unknown.*
- ** = an occurrence number has not been assigned.*
- *CNF = Angeles National Forest*

- *RIV = Riverside County*

Threats

Several of the historic occurrences of this species have been extirpated, primarily due to urban development and clay mining in Riverside County. Of the remaining populations, only a few enjoy substantial protection, including the Cleveland NF occurrence. Development, agricultural land conversion, off-highway vehicles, and nonnative species invasions increasingly threaten populations on private land.

The Cleveland NF occurrence is adjacent to a National Forest System Road (6S07), a designated off-highway vehicle (OHV) area, and an electronic site. Protection measures implemented to keep OHVs from driving over *Allium munzii* habitat include fencing, gating, and monitoring. In addition, future development at the Elsinore Peak electronic site will be designed to avoid adverse effects to *Allium munzii*. The Elsinore Peak electronic site does not negatively affect *Allium munzii*, as the electronic site is confined to the peak, upslope from the onion's habitat.

The most significant threat to the Cleveland NF occurrence is competition for quality habitat from nonnative species such as wild oats and mustard plants that persist at this site. Vehicle use of the access road to the Elsinore Peak electronic site and unauthorized OHV use make the habitat vulnerable to erosion and nonnative species introduction.

There is a low probability of detecting additional populations on National Forest System land, as extensive surveys of the Trabuco District were conducted in 1991 (Boyd and Mistretta 1991).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Allium munzii*:

- Implement strategies in the Munz's onion Species Habitat Management Guide (USDA Forest Service 1992).
- Monitor and repair barriers that prevent vehicle use on the occurrence. Install additional protection measures as needed. Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands. Allow wildland fires to freely burn on through populations.
- Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks and roads, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. The use of hand line for fuel break construction is preferred. *Future development at the Elsinore Peak electronic site should be designed to avoid adverse effects to Allium munzii.*
- Future management of the slopes of Elsinore Peak and other areas of *Allium munzii* habitat should include minimal development. Campgrounds and facilities are inappropriate uses of

Allium munzii habitat; they would have serious adverse effects on these plants and their habitat.

- The parcel of land in Section 36 that supports *Allium munzii* should be acquired.

Evaluation of Current Situation and Threats on National Forest System Lands

Allium munzii is considered to have moderate vulnerability on National Forest System lands due to its restricted habitat – clay soils – and the close proximity of the one occurrence to roads and an OHV area. These conditions may potentially degrade habitat as a result of erosion, soil compaction, and nonnative species establishment. The protection measures implemented for the Elsinore Peak population have assisted in deterring additional habitat degradation. The trend for this species appears to be stable on the Cleveland NF. The Cleveland NF occurrence is one of the largest populations, presumably sufficient to maintain genetic diversity within the population. There is little to no risk of extirpation of this occurrence. However, this occurrence is the only one on the National Forest System lands. Landscape-scale catastrophic events or activities associated with wildfire suppression, such as fuel break and hand line construction, staging areas, and introduction of invasive weeds, may be the most significant threats to this occurrence. The Cleveland NF occurrence represents the highest elevation extension of the species' range, potentially having unique genetic variability essential for possible adaptation to range expansion or climatic changes.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon narrow endemic in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	C	B	C	B

Viability outcomes on NFS lands are based on the following management direction and circumstances. *Allium munzii* is federally listed as Endangered, which assures that any new project proposed in or near its habitat will undergo considerable scrutiny and is subject to consultation with the U.S. Fish and Wildlife Service. Use of the CNF Place Standard S10, which states “Future development at Elsinore Peak will be designed to avoid adverse effects to Munz’s onion (Elsinore Place)” would be used in alternatives 2-6. The protection measures currently in place for the Elsinore Peak population would continue under all alternatives. Invasive nonnative plants will continue to pose a risk to the species under all alternatives.

Under Alternative 1, the Elsinore Peak area would be managed as a Developed Area Interface land use zone. The current management of *Allium munzii* habitat would be retained which includes a high level of monitoring.

Under Alternative 2, the Elsinore Peak area would be managed as Developed Area Interface and Back Country land use zones. In this alternative, there is a higher level of investment in avoidance and minimization of effects to species-at-risk but provides little focus on the restoration of habitats. More intensive user controls would be designed to minimize user conflicts with sensitive environmental resources.

Under Alternative 3, the north side of Elsinore Peak would be zoned as Back Country Non-Motorized, with the rest of the area zoned as Developed Area Interface and Back Country. In this alternative there is a higher level of investment in proactive habitat improvement and surveys, and a stronger focus on habitat restoration compared to avoidance of habitat degradation. There is a higher level of investment in maximum visitor capacity controls and modification of existing facilities including a decommissioning of recreation facilities and individual sites that are affecting sensitive resources.

Under Alternative 4, the Elsinore Peak area would be zoned as Developed Area Interface and Back Country. This alternative would provide the most emphasis on all types of recreation. In this alternative, there is a higher level of focus on management of recreation growth including monitoring recreation use and its effects and managing use in order to offset effects of uses on other resources such as wildlife and vegetation, emphasizing enforcement, and public education programs.

This alternative could create a higher level of recreational impacts to *Allium munzii* habitat over the long-term because the focus would be on sustaining the recreation resource by maintaining or expanding facilities at a moderate rate with less emphasis on sustainable dispersed recreation.

In Alternative 4a, the occurrence at Elsinore Peak would be managed under Developed Area Interface and Back Country zoning. In this alternative as in alternative 4, there is a higher level of focus on management of recreation growth including monitoring recreation use and its effects and managing use in order to offset effects of uses on other resources such as wildlife and vegetation, emphasizing enforcement, and public education programs. Under alternative 4a, recreation effects to *Allium munzii* would be expected to be less than alternative 4 as the recreation emphasis in this alternative would be to sustain the setting through management of dispersed recreation and to maintain or expand existing facilities prior to constructing new ones at a low rate.

In Alternative 5, the occurrence at Elsinore Peak would be managed under Developed Area Interface and Back Country zoning. Alternative 5 is designed to fully accommodate the projected demand for motorized recreation use, which could bring more people to the designated OHV area near the occurrence. This in turn may increase incidents of unauthorized off-route vehicle travel in the area occupied by *Allium munzii*, increasing the risk that portions of the population could be damaged.

In Alternative 6, Elsinore Peak would be zoned Developed Area Interface and Back Country with Back Country Non-Motorized zoning adjacent to the north. There is a higher level of emphasis in Alternative 6 on low impact recreation, visitor capacity controls, public education and habitat restoration; these would benefit the taxon.

Viability Outcome for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Development, agriculture land conversion, off-highway vehicles, and nonnative species invasions threaten *Allium munzii* occurrences throughout its range. Approximately 18% of the documented occurrences have been extirpated. Increased attention to this species within the last decade has resulted in some preservation of occupied habitat on private lands. Transplanting of threatened occurrences may be necessary for the continued viability of this species.

Because the Cleveland National Forest population occurs at the highest elevation across its range, has the most intact habitat, and contains a large number of plants, this occurrence may be important for the preservation of this species. Most of the remaining occurrences on private land are targeted for acquisition as preserve land under the Riverside County Multiple Species Habitat Conservation Plan (Dudek & Associates, Inc. 2003). If this Plan is implemented as proposed, variations in potential impacts by alternative to this one population on National Forest System lands would not affect the overall outlook for this species.

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Allium marvinii

Allium parishii

Allium parishii

Allium parishii Watson (Parish's onion)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3? (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-2

General Distribution

Allium parishii is known from scattered populations in western Arizona and the Mojave Desert; of San Bernardino, Riverside, and Imperial counties in California (California Native Plant Society 2001, McNeal 1993).

Distribution in the Planning Area

Populations of *Allium parishii* occur near the San Bernardino National Forest on the desert-side slopes of the San Bernardino Mountains and in the Little San Bernardino Mountains (USDA Forest Service 2002). One occurrence of *Allium parishii* has been reported on the San Bernardino National Forest, 0.6 mile north of the Willow Creek Jeep Trail in the vicinity of Lake Arrowhead (CalFlora 2002), however this occurrence is based on a mis-identified *Allium parishii* (White pers. comm.). Another occurrence at Furnace Canyon is very near the San Bernardino National Forest boundary.

Taxonomy and Natural History

Allium parishii is a monocotyledon in the lily family (Liliaceae). *Allium parishii* is a perennial herb that produces a bulb. It blooms April-May (California Native Plant Society 2001).

Allium parishii has a 10-15 mm ovoid bulb with outer coats that are red-brown, are lacking or have obscure sculpture (surface ornamentation), and pink inner coats. The stems are 30-70 cm. There is a single cylindrical leaf that is less than twice the stem length. The inflorescence consists of 6-25 flowers with 5-15 mm pedicels. The flowers are 12-18 mm and have spreading perianth parts that are

lanceolate, entire, and pale pink with darker midveins. There are 6 ovary crests that are entire or finely and irregularly dentate (McNeal 1993).

Habitat Description

Allium parishii occurs on open, rocky slopes in Joshua tree woodlands, Mojavean Desert scrub, and pinyon-juniper woodland at elevations of 3,000–4,800 feet (915-1,465 meters) (California Native Plant Society 2001, McNeal 1993). *Allium parishii* grows on various soil types, including carbonate soils. Suitable habitat for this species is widespread across the lower northern slopes of the San Bernardino National Forest. Most of this habitat occurs across areas of the forest with low recreation density, and associated relatively infrequent threats associated with vehicle travel off of designated system roads and trails. The carbonate portion of his species range is threatened by mining, however these activities will be addressed at the project level and will be guided by the Carbonate Habitat Management Strategy.

Occurrence Status

The only recorded occurrence on the SBNF has been determined to be erroneous (White, pers. comm.). It has not been visited since 1986, and has since burned in the 1999 Willow Fire. The recorded occurrence at Furnace Canyon, within 1 mile of the SBNF, has not been visited since 1998, and at that time was threatened by OHV use and mining related activities. The current status of the occurrence at Mitsubishi's Cushenbury mine is not known.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Allium parishii* (Parish's onion)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
* Erroneous occurrence.	U	1986	Upper Kinley Creek, along Hwy 173 N of Lake Arrowhead, 0.6 mi. N of the Willow Creek Jeep Trail. SBNF. (Cal Flora 2002) Erroneous occurrence see above.	SBD

*	U	1998	Furnace Canyon. Carbonate soil with <i>Erigeron parishii</i> and <i>Astragalus albens</i> . Mining and high levels of recreation use, particularly OHVs, may impact this species. Land ownership: Priv.	SBD
*	U	U	Burns Canyon Rd. UCR Collection. Land ownership: U. (Krantz, et.al. draft 2000 2003)	SBD
*	U	U	Pfizer mining operations area, base of Marble Cyn. UCR collection. (Krantz, et.al. draft 2000 2003)	SBD
*	U	U	Cushenbury Cyn area, Mitsubishi mine. UCR collection. (Krantz, et.al. draft 2000 2003)	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

The primary threats to populations of *Allium parishii* are mining and dispersed recreation use, particularly vehicle use off of classified roads (USDA Forest Service 2003). Where there is potential for it to occur on carbonate soils, these areas will receive long term protection under the Carbonate Habitat Management Strategy.

Conservation and Management Considerations

The priority conservation strategy for this species is to implement the Carbonate Habitat Management Strategy. The following is a prioritized list of conservation practices that should be considered for *Allium parishii*:

- Implement the Carbonate Habitat Management Strategy.
- Survey all new occurrences of *Allium parishii* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.

- Collect a herbarium voucher specimen of *Allium parishii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Allium parishii* in the southern California National Forests using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Allium parishii is a Mojave Desert (into AZ) endemic that is uncommon throughout its range. Suitable habitat is distributed across the desert transition areas of the SBNF, and it is likely that the species is patchily distributed throughout this area. While the suitable habitat may be vulnerable to identified threats, the Carbonate Habitat conservation Strategy will likely be effective at protecting large portions of this habitat. Mining impacts in the carbonate portion of this species' suitable habitat will be addressed at the project level, and will be guided by provisions of the Carbonate Habitat Management Strategy.

Based on this analysis, *Allium parishii* has been assigned the following threat category:

2. Potential habitat only in Plan area.

Viability Outcomes

Allium parishii is on the San Bernardino National Forest Watch List. During project surveys, information will be recorded on occurrences of *Allium parishii* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

No populations of *Allium parishii* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupported assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Allium parishii*.

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Allium munzii

Androsace elongata ssp. acuta

Androsace elongata ssp. acuta

Androsace elongata ssp. acuta (E. Greene) G. Robb. (California androsace)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G?T3?; S3.2? (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-2

Other: *Androsace elongata* is listed as Endangered in Oregon

General Distribution

Androsace elongata ssp. acuta occurs at scattered locations from Oregon to Baja California. It occurs primarily in the San Francisco Bay Area, San Joaquin Valley, inner South Coast Ranges, and the south coast regions (Cholewa and Henderson 1993). In eastern San Luis Obispo County, *Androsace elongata ssp. acuta* is found from Cottonwood Pass to the Temblor Range and Carrizo Plain (Hoover 1970). California Natural Diversity Database (2004) does not presently list any of the known occurrences.

Distribution in the Planning Area

Androsace elongata ssp. acuta is known from Garner Valley (San Jacinto Mountains) on the San Bernardino National Forest and from areas north of the National Forest on the northern slope of the San Bernardino Mountains (Stephenson and Calcarone 1999). Specific occurrences in the San Bernardino Mountains include 1.5 miles northwest of Deep Creek Dam, Las Flores Ranch area, southeast of Apple Valley, and west of Lovelace Canyon.

There is a historical collection of *Androsace elongata ssp. acuta* from the Elizabeth Lake Canyon on the Angeles National Forest, and a recent collection from Liebre Mountain (Boyd 1998, Rancho Santa Ana) confirms that this species persists on the forest.

There is a single occurrence from the Ballinger Canyon area of the Los Padres National Forest (Burgess 1997, Santa Barbara Botanic Garden). This taxon also occurs on or adjacent to the Cleveland National

Forest in San Diego County, where it reportedly occurs in the Cuyamaca Mountains, Montezuma Valley, and Warner Springs (Beauchamp 1986). Montezuma Valley and Warner Springs are privately owned inland desert valley grasslands. Potential habitat also occurs on Bureau of Land Management land in the San Felipe Hills and at Anza-Borrego Desert State Park.

Taxonomy and Natural History

Androsace elongata ssp. *acuta* is a dicot in the primrose family (Primulaceae). This taxon is an annual herb that blooms March-June (California Native Plant Society 2001). It is the only subspecies of *Androsace elongata* occurring in California (Cholewa and Henderson 1993).

Androsace elongata ssp. *acuta* is 2-8 cm and hairy. The peduncles are generally solitary. Leaves are 5-20 mm, linear-lanceolate, tapered to petiolate, acute to acuminate, entire or finely dentate, and ciliate. The inflorescence is characterized by 2.5-5mm involucre bracts that are less than 1 mm wide, ovate to lanceolate, and acute to acuminate. The pedicels are 0.6-6.4 cm. The calyx is 3.5-5 mm and hairy. The lobes are generally equal to the tub, awl like, with stiffly acute, reddish tips. The corolla is white and is shorter than the calyx (Cholewa and Henderson 1993).

Because *Androsace elongata* ssp. *acuta* is an annual, it may exhibit high annual variability; surveys conducted during below-average precipitation years may overlook habitats that are actually occupied during average and above-average precipitation years.

Habitat Description

Androsace elongata ssp. *acuta* is found in grassland, chaparral, coastal sage scrub, semi-desert shrub, pinyon-juniper woodland, and cismontane woodland habitats at elevations of 1,000-3,940 feet (305-1,200 meters), but occurrences are highly localized (California Native Plant Society 2001). It typically occurs where vegetation cover is low and mesic conditions are present, such as on and adjacent to moss-covered soil or rock outcrops on north-facing slopes or along rocky washes.

Occurrence Status

There are no occurrences listed in the California Natural Diversity Database (2004). Many occurrences throughout the taxon's range have been extirpated (California Native Plant Society 2001). The distribution of *Androsace elongata* ssp. *acuta* on National Forest System lands is poorly known (Stephenson and Calcarone 1999).

The following table shows the number of occurrences recorded in the literature in and near the Planning Area, the number of plants reported to be present, and the general location of these occurrences.

Occurrence data – *Androsace elongata* ssp. *acuta* (California androsace)

Occurrence	No. of Plants	Year Reported	Location/Land Owner	County
*	U	U	1.5 mi. NW of Deep Creek dam. Land ownership: Private?	SBD
50781 (UCR)	U	1988	Las Flores Ranch area, ca. 2 mi. N of intersection of Grass Valley Creek and Hwy 173, ca. 2.5 mi. E of the California Aqueduct, T3N/R4W/S14,15, &16, elev. 3200-3400 ft. Land ownership: Private	SBD
88147 (UCR)	U	1995	SE of Apple Valley, Valley View Rd. W of Lovelace Cyn. S of the Santa Fe RR tracks, T4N/R2W/S22?, elev. 3600 ft. Land ownership: Private.	SBD
*	U	U	San Dimas, Puddingstone. Land ownership: LA County Parks Department. (CalFlora 2002)	LA
*	U	1986	2 miles north of Mojave Forks Reservoir (Boyd RSA). Priv.	SBD
*	U	1932	Where Elizabeth Lake Canyon enters hills, near Palmdale. ANF.	LA
*	U	1998	Liebre Mountains. ANF. (Boyd RSA)	LA
*	U	1994	Santiago Canyon near Little Rock Creek. ANF. (Mistretta RSA).	LA
*	250	1995	Garner Valley, San Jacinto Mountains. SBNF. (Stephenson and Calcarone 1999)	RIV
*	U	1995	½ mile E of Hwy 79 junction with Route S1. Cuyamaca Lake. [State Park?]	SD
*	U	U	Granite Mountains, east of Victorville (RSA 2005)	SBD

51012 (UCR)	U	1988	Hesperia area, ½ mi. W of Lake Arrowhead Rd., and Approx. 1 1/2 mi. NW of Deep Creek Dam, T3N/R4W/S12&13, (Myers/UCR)	SBD
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- *U* = *Unknown*
- * = *An occurrence number has not been assigned*
- *ANF* = *Angeles National Forest*
- *CNF* = *Cleveland National Forest*
- *LA* = *Los Angeles County*
- *RIV* = *Riverside County*
- *RSA* = *Rancho Santa Ana Botanic Garden*
- *SBNF* = *San Bernardino National Forest*
- *SBD* = *San Bernardino County*
- *SD* = *San Diego*

Threats

Threats to the species have not been described (California Native Plant Society 2001). Threats to *Androsace elongata* ssp. *acuta* may include grazing, trampling, fuels and vegetation management, invasive species (primarily cheatgrass), too-frequent fire, and recreational activities.

Conservation and Management Considerations

- Write and implement a habitat management guide for *Androsace elongata* ssp. *acuta* where it occurs on the San Jacinto district of the SBNF, along with associated sensitive species (e.g. *Penstemon californicus* and *Arabis johnstonii*).
- Survey all new occurrences of *Androsace elongata* ssp. *acuta* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Androsace elongata* ssp. *acuta* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in the last ten years.
- Map known and new occurrences of *Androsace elongata* ssp. *acuta* in the Province using NRIS data collection standards.
- Monitor effects of grazing seasonality and intensity where this taxon occurs within allotments. If adverse effects are identified, consider modifying terms of permits to minimize effects.

Evaluation of Current Situation and Threats on National Forest System Lands

Androsace elongata ssp. *acuta* has a wide range but where found it typically occurs in small patches. It is especially uncommon in southern California and is currently recorded from five localities on National Forest System lands within the Province. These areas may be subject to impacts from grazing, invasive

species, dispersed recreation, vegetation management, road and trail maintenance, and off road travel.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

On the San Bernardino National Forest, where *Androsace elongata* ssp. *acuta* is a Watch List Species, information will be recorded on occurrences to the extent possible. This information will be used to track or "watch" for trends in specis abundance and distribution.

Knowledge about distribution and habitat conditions for *Androsace elongata* ssp. *acuta* is imprecise and is based on coarse scale analysis of the following types of vegetation: chaparral, semi-desert scrub, and pinyon-juniper woodland. Within the historic range of *Androsace elongata* ssp. *acuta*, the condition of chaparral appears to not be of concern. Fire frequencies and species composition, for the most part, appears to be within the range of natural variability except for the Summit Valley area, portions of which have burned at least three times in the past decade. At the landscape scale, the semi-desert scrub and pinyon-juniper woodlands also appear to be in good condition except for broadly increasing densities of cheatgrass associated with recent fires and grazing. These threats are roughly equivalent across all alternatives. However, Alternative 5, with greater emphasis on dispersed recreation and motor vehicle based recreation in areas where habitat for *Androsace elongata* ssp. *acuta* is present, would likely result in more disturbance and higher fire frequencies in these vegetation types. Increased fire frequencies combined with increase grazing and increased recreational activity, including unauthorized off-road travel, would increase the risk that invasive nonnative plants would be spread and introduced into these vegetation types. This would further degrade habitat for *Androsace elongata* ssp. *acuta*.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
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C	C	C	C	C	C	C
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Many places where *Androsace elongata* ssp. *acuta* once occurred have become highly urbanized or the lands have been converted to farmlands. The edges of the San Joaquin Valley and the inner coast ranges of California south of San Francisco have also undergone tremendous changes in land use. All of this statewide development has reduced the amount of habitat available to *Androsace elongata* ssp. *acuta* and current trends in land development would result in further loss of habitat in areas around the national forests of southern California; e.g., Rancho Los Flores in Summit Valley. Populations that have become isolated would remain isolated under all alternatives. Because so little habitat for *Androsace elongata* ssp. *acuta* is present on National Forest System lands the effects of national forest management on the overall distribution and abundance of the species is minimal.

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Allium parishii

Antennaria marginata

Antennaria marginata

Antennaria marginata E. Greene (White-margined everlasting)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G4? S1.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 3-1-1

General Distribution

Antennaria marginata is known from Colorado, New Mexico, and southern California (Stebbins & Bayer 1993). The three known occurrences in the San Bernardino Mountains of southern California are disjunct and are located in the upper Santa Ana River watershed.

Distribution in the Planning Area

All three occurrences in California are on the San Bernardino National Forest in the South Fork of the Santa Ana River watershed between Barton Flats in the north and San Gorgonio Mountain in the south (California Natural Diversity Database 2004). One occurrence is within the San Gorgonio Wilderness.

Taxonomy and Natural History

Antennaria marginata is an herbaceous dicotyledonous perennial in the sunflower family (Asteraceae). In California, plants are pistillate, stems are between 15 and 18 cm long, and the horizontal stolons are 2-7 cm long. Basal leaves are 15-20 mm long, spoon-shaped, 1-veined, green above with white-woolly margins, and gray-tomentose below. Cauline leaves are linear and 7-16 mm long. There are 5-8 heads per inflorescence. Each inflorescence has an involucre that is 5-7 mm long, sparsely hairy at its base with wide phyllaries (the upper part of which is white) that have acuminate tips. Corollas are 4.5-6.5 mm long, and fruits are papillate and 0.8-2 mm long, with pappus that is 5.5-8.5 mm long (Stebbins & Bayer 1993). Flowering occurs May through July (Munz 1974).

Habitat Description

In the San Bernardino Mountains, *Antennaria marginata* occurs in dry areas within lower and upper montane conifer forest habitats between 7,700-11,000 feet.

Occurrence Status

Three occurrences of *Antennaria marginata* have been documented in California (California Natural Diversity Database 2004; Krantz, et.al. draft 2000 2003, USDA Forest Service 2002). One of these occurrences (California Natural Diversity Database occ.#2) is located on San Gorgonio Mountain in the San Gorgonio Wilderness at 11,000 feet. However, this occurrence has not been documented since 1904, and the exact location of the collection is unknown. If extant, it is possible that the remote location of this occurrence within the San Gorgonio Wilderness has protected it from extirpation. The status of the occurrence near Barton Flats north of the San Gorgonio Wilderness (California Natural Diversity Database occ.#1) is intact with no known serious threats observed in a portion of the habitat in 2002. Roads do not access this location nor does public fuelwood collection occur in this location. A portion of the occurrence of *Antennaria marginata* in the San Bernardino Mountains near the Poopout Hill trailhead, just west of the South Fork of the Santa Ana River at 7,700 feet (Krantz, et.al. draft 2000) is also intact, with no effects noted in 2002 by FS botanists however the full range of the occurrence within these populations has not been documented in recent years and is needed.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Antennaria marginata* (White-margined everlasting)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1947 2002	South Fork of the Santa Ana River near Barton Flats, San Bernardino Mountains. This occurrence observed in 2002 in T1N, R1E, section 23 on dry open slopes above South Fork Creek in white fir forest with <i>Eriogonum wrightii</i> var. <i>subscaposum</i> , <i>Achillea millefolium</i> , <i>Euphorbia palmeri</i> . Locally abundant, occurs with <i>Heuchera parishii</i> . Trail along creek does not affect occurrence, no serious threats to population observed . (Hall/Volgarino) SBNF	SBD

2	U	1904	Grayback Mountain (San Gorgonio Mountain) SBNF-San Gorgonio Wilderness	SBD
*	U	U 2002	Near Poopout Hill trailhead. This occurrence also observed in 2002, plants in rocky areas on west side of Trail leading to South Fork Meadow from Poopout Hill area. No disturbances noted, trail maintenance does not appear to affect individuals in surveyed locations. (Volgarino/Hall) SBNF	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

The three occurrences of *Antennaria marginata* on the SBNF are minimally affected by use of trails (and possibly trail maintenance) leading to the San Gorgonio Wilderness. Plants are locally abundant with no serious threats known at this time.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Antennaria marginata*:

- Survey all new occurrences of *Antennaria marginata* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Antennaria marginata* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Antennaria marginata* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System lands

Antennaria marginata is disjunct and located in the upper Santa Ana River watershed, within and adjacent to the San Geronio Wilderness. The occurrences are remote and inaccessible to vehicle impacts; other impacts observed in 2002 along trails are minimal.

Based on this analysis, *Antennaria marginata* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Antennaria marginata is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Antennaria marginata* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Antennaria marginata* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Antennaria marginata* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Androsace elongata ssp. acuta

Arabis breweri var. pecuniaria

Arabis breweri var. pecuniaria

Arabis breweri S. Watson var. *pecuniaria* Rollins (San Bernardino rock cress)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4?T1; S1.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Arabis breweri var. *pecuniaria* is endemic to the planning area in the eastern San Bernardino Mountains.

Distribution in the Planning Area

Arabis breweri var. *pecuniaria* has been reported from three occurrences in the San Gorgonio Wilderness of the San Bernardino National Forest in San Bernardino County (California Natural Diversity Database 2004; Krantz, et.al. draft 2000).

Taxonomy and Natural History

Arabis breweri var. *pecuniaria* is a dicotyledonous plant in the mustard family (Brassicaceae). *Arabis breweri* var. *pecuniaria* is a caespitose perennial with a woody caudex. Cauline leaves are less than 2cm with dense hairs. Sepals are grayish with sparse hairs and petals are 6-8 mm. Fruit are 2-3 cm with a glabrous 3-4 mm pedicel (Rollins 1993). This perennial typically flowers between July and August (Munz 1974).

Habitat Description

Arabis breweri var. *pecuniaria* occurs in subalpine coniferous forest on rocky substrates (*e.g.* cliffs, ledges, and talus) above 9,000 feet elevation (between 2,700 and 3,200 meters (Rollins 1993).

Alpine habitat on the four southern California National Forests occurs only in the highest reaches of the San Gabriel, San Bernardino, and San Jacinto mountains, and the summit of Mount Pinos. Alpine and subalpine habitats are most extensive on the high slopes of Mount San Gorgonio and Mount San Jacinto. Alpine habitat comprises only 1,913 acres within the southern California National Forests. This habitat consists of alpine scrub and barren areas. Alpine plants are vulnerable to trampling by hikers and other forms of ground disturbance (Billings 1988) but these impacts are limited to small areas around developed recreation areas and trails. Trampling and other ground disturbances resulting from hiking, rock climbing and camping have removed or degraded some habitat. In general, however, alpine habitat is considered to be largely intact, stable, and little disturbed with the exception of some heavy recreation use in the immediate vicinity of trails. Alpine and, to a lesser extent, subalpine habitats are subjected to natural climatic fluctuations on a regular basis. Prolonged snow pack, growing season frosts, extreme winter weather, and other factors can reduce growth and minimize or prevent reproduction (Barbour 1988, Billings 1988, Major and Taylor 1988). These conditions coupled with the slow growth habits of alpine plants may prolong post-disturbance recovery.

Occurrence Status

Data on population abundance and distribution is available for 1980 and 1994. However, monitoring was not conducted for the years in between visits. The population trend of *Arabis breweri* var. *pecuniaria* is unknown. An unsuccessful attempt to relocate occurrence no. 1 in 1994 may indicate a decline, but may also indicate normal annual variability in abundance. Although the information below may suggest a decline in populations, the habitat quality and quantity for this species is not in decline.

OCCURRENCE DATA – *Arabis breweri* var. *pecuniaria* (San Bernardino rock cress)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1980	Southwest side of Dollar Lake (9,400 feet) on talus in subalpine coniferous forest. Ass. with <i>Pinus flexilis</i> , <i>Pinus contorta</i> , <i>Heuchera parishii</i> , <i>Ranunculus eschscholtzii</i> , <i>Sedum</i> sp., <i>Chrysolepis sempervirens</i> , and <i>Penstemon caesius</i> . Revisited in 1994, but population not found. Population presumed extant because of location in a steep area difficult to access. San Gorgonio Wilderness-SBNF.	SBD

2	25 (1980) 6 (1994)	1980	San Gorgonio Mountain along the Sky High Trail from Mineshaft Saddle to the summit. At east end of the mountain on a steep, north-facing granite talus slope in lodgepole pine forest (10,500 feet). Ass. with <i>Pinus contorta</i> ssp. <i>murrayana</i> , <i>Silene</i> sp., <i>Monardella</i> sp., <i>Heuchera parishii</i> , <i>Eriogonum kennedyi</i> var. <i>alpigenum</i> , <i>Ribes montanum</i> . San Gorgonio Wilderness-SBNF.	SBD
*	U	U	Ballmer & Pratt UCR-13950. N slope of San Gorgonio. 11,000'. San Gorgonio Wilderness-SBNF. Precise location is unknown. (Krantz, et. al. draft 2000)	SBD

- U = Unknown
- * = an occurrence number has not been assigned
- SBNF = San Bernardino National Forest
- SBD = San Bernardino County

Threats

All known occurrences are within the San Gorgonio Wilderness. Recreation within the Wilderness area, primarily hiking and horse-back riding, poses a low threat to this taxon. CNDDDB Occurrence 1 is in a steep, inaccessible area and is not likely to be threatened by recreational Forest use. CNDDDB Occurrence 2 is located along the Sky High Trail. It is possible that initial trail construction impacted part of the population; however, current threats to this occurrence are low. This occurrence is on a steep slope where off-trail use is unlikely to occur.

Potential habitat for *Arabis breweri* var. *pecuniaria* on the SBNF consists of subalpine coniferous forest and rocky alpine talus slopes. Currently, there are low threats to this habitat; all suitable habitat is located within the San Gorgonio Wilderness where limited activities occur.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Arabis breweri*

var. *pecuniaria*:

- Survey all new occurrences of *Arabis breweri* var. *pecuniaria* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Arabis breweri* var. *pecuniaria* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Arabis breweri* var. *pecuniaria* in the planning area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Arabis breweri var. *pecuniaria* is a narrow endemic that is known from only three occurrences within a 3-mile radius. This taxon occupies talus slopes in the subalpine and alpine zones. On the SBNF, these zones are restricted to the San Gorgonio Wilderness, suggesting that this taxon is naturally rare. Known populations are small, but because they are in a Wilderness Area, they are protected from most Forest uses and activities that occur elsewhere on the SBNF.

Habitat conditions at the Dollar Lake occurrence are undisturbed. Although Dollar Lake is a popular destination spot, the actual occurrence site is protected by steep, inaccessible terrain. The occurrence on the eastern end of San Gorgonio Mountain is along the Sky High Trail. This occurrence may be affected by trail use; however, considering that this section of the trail consists of switchbacks on a steep slope, off-trail use is unlikely to occur. Because the occurrences are in a Wilderness Area, Forest Service management activities are minimal. Trail maintenance and permitted trail use by hikers and equestrians are the only Forest Service activities planned for this area.

The risk of extirpation/extinction to *Arabis breweri* var. *pecuniaria* is low. This is based on the nature of the species' distribution and on a possible decline in population abundance and distribution.

The appropriate level of analysis for *Arabis breweri* var. *pecuniaria* is site-specific assessment for any management activities that will affect the populations where this species occurs. A site-specific assessment should evaluate conservation measures such as adding signs at trailheads to discourage off-trail hiking by alerting the public of the sensitive resources.

Based on this analysis, *Arabis breweri* var. *pecuniaria* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Arabis breweri var. *pecuniaria* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Arabis breweri* var. *pecuniaria* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Arabis breweri* var. *pecuniaria* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Antennaria marginata

Arabis dispar

Arabis dispar

Arabis dispar M.E. Jones (Pinyon rock cress)

Management Status

Federal: Forest Service Watch List

California: G3; S2.3 (California Natural Diversity Database)

California Native Plant Society - List 2; R-E-D Code 2-1-1 (California Native Plant Society 2001).

General Distribution

Arabis dispar is a relatively wide-ranging species occurring in Inyo, Mono, Tulare, and San Bernardino counties in California. Its range extends to southwestern Nevada. The California Natural Diversity Database lists 17 occurrences in California that are presumed extant, but many have not been revisited in recent times (California Natural Diversity Database 2004). Occurrences are known from the Sierra Nevada, the White-Inyo Mountains, the Panamint Mountains, the Coso Range, the Argus Range, the San Bernardino Mountains, and the Little San Bernardino Mountains in Joshua Tree National Park.

Distribution in the Province

Arabis dispar occurs on the San Bernardino National Forest in the northern San Bernardino Mountains. It is also recorded from Mt Baldy in the Eastern San Gabriel Mountains, straddling the boundary between SBNF and ANF. It is not known to occur on any other Forest in the Province. Populations are reported from Cushenbury Canyon and east of Baldwin Lake (California Natural Diversity Database 2004). It is also known on the San Bernardino National Forest from Nelson Ridge, the ridgetop east of Arrastre Creek, and Burns Reserve (Krantz, et. al. draft) and along Forest Service Roads 3N03 and 2N02 in the Big Bear Valley area (USDA Forest Service 2002). Several occurrences along these roads were observed as recently as May 2005.

Natural History

Arabis dispar is a dicotyledon in the mustard family (Brassicaceae). This species is a perennial herb that blooms March–June (California Native Plant Society 2001). It has a branched caudex and minute, multi-branched hairs. There are several 1-2.5 dm stems that are simple or branched above the base and have

dense hairs below. The many basal leaves are whitish hairy, erect, 1.5-2.5 cm, slender-petioled, linear-oblongate to oblanceolate, and entire. Cauline leaves are 1-2 cm, sessile, and widely linear. The flowers are characterized by ovate, purplish petals that are greater than the sepals. Fruit are ascending, 5-7 mm, 2.5-3.5 mm wide, glabrous, and have an acute tip. The pedicel is more or less erect to ascending, 1-2 cm, and hairy. The seeds are more or less 2.5 mm and round, with a wide wing. (Rollins in Hickman, ed. 1993)

Habitat Description

Arabis dispar is associated with desert montane plant communities such as pinyon-juniper woodlands, Joshua tree woodlands, and Mojavean desert scrub. It grows in granitic soils, gravelly substrates, pebble plains, and compact talus at elevations of 4,000-8,000 feet (1,200-2,400 meters) (California Native Plant Society 2001). Some occurrences have been found on carbonate soils. In San Bernardino County, *Arabis dispar* has been found in association with *Arctostaphylos glauca*, *Cercocarpus ledifolius*, *Chrysothamnus viscidiflorus*, and *Achnatherum coronatum*. In Inyo County, this species has been found in association with *Salvia dorrii*, *Castilleja angustifolia*, *Grayia spinosa*, *Thamnosma montana*, *Chrysothamnus teretifolius*, and *Ericameria cuneata*. (California Natural Diversity Database 2002a)

Pinyon-juniper woodland, Joshua tree woodland, and Mojavean desert scrub are all widespread within the Province. However, all of these may be affected by altered fire regimes. In addition, carbonate habitat is threatened by mining activities.

Occurrence Status

Arabis dispar is distributed in a limited number of occurrences in Southern California, though it is more common elsewhere in its range (California Native Plant Society 2001).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Arabis dispar* (Pinyon rock cress)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
9	U	1929	Vicinity of Cushenbury Springs, San Bernardino Mountains. Land ownership: Mitsubishi Cement.	SBD

10		1937, 1948	Cactus Flat in Cushenbury Canyon, San Bernardino Mountains. SBNF. //	
86789 (UCR)	U	1995	Cushenbury Cyn., along Hwy 18, 1.9 mi. below the summit and ca. 1 km above Cactus Flat, T3N/R2E/S32/W ½ of NW ¼ elev. 6200 ft.(Sanders/UCR)	SBD
106328 (UCR)	U	1998	Cactus Flat, North of road 3N62 and Grapevine Creek, T3N/R2E/S19, 5800' (Soza/RSA)	SBD
11		1969	2 mi. E of Baldwin Lake on road to Pioneertown, S of Granite Springs, San Bernardino Mountains. N side of hill in rocky open areas, close to taller bushes. On dirt road ca. 0.75 mi. below road summit and 1 mi. before Arrastre Creek. Mapped on N side of a hill w/ a 6804' summit. Land ownership: SBNF. (Ryan/UCR,Jeps)	SBD
12	U	1922	Quail Springs, Little San Bernardino Mountains. Loose gravelly soil, Joshua Tree NP.	SBD, RIV

17	U	1994	E slope of White Mountain, ca. 0.6 mi. NNE of South Peak, San Bernardino Mountains. Area under mineral claim. Future road building and mining are threats. Pinyon-oak (<i>Q. chrysolepis</i>), woodland with <i>Arctostaphylos glauca</i> , <i>Cercocarpus ledifolius</i> , <i>Chrysothamnus viscidiflorus</i> , <i>Achnatherum coronatum</i> . Soils of loose, gravelly talus derived from carbonate bedrock. NE-facing slope ca. 500m E of White Mountain 7727' Benchmark. SBNF.	SBD
13950 (UCR)	U	1973	Burns Pinyon Reserve, T1N/R5E/S27/W ½, elev. 4000 ft. Land Ownership: University of California. (Clarke/UCR)	SBD
16929 (UCR)	U	1979	Forest Road 2N03, East of Arrastre Creek. (Krantz/UCR). Ownership: SBNF.	SBD
38100 (UCR)	U	1985	North Slope of SB Mtns, Hwy 18 at 6200'. (Sanders/UCR). Ownership: SBNF)	SBD
138466 (UCR)	U	1998	North Peak, 6100', T3N/R1W/S7/SE ¼ of NW ¼ (SOZA/RSA). SBNF.	SBD
*	U	1998	Mineral Mountain, SW Slope, NE Side of Rattlesnake Cn, East of Round Valley, S1/2S1/2 Sec. 20. (White/RSA). SBNF	SBD

*	U	1980	Above Cactus Flat, W of Hwy 18, N of Baldwin Lake. (Thorne/RSA). SBNF.	SBD
*	U	1991	Mount Baldy, 8,000' to 9,700'. (Mistretta/RSA). SBNF/ANF.	SBD/LA

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *ORV= off-road vehicle*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *TNC= The Nature Conservancy*

Threats

Habitat where pinyon rock cress occurs on the San Bernardino National Forest is affected by mining, road construction, shooting, unauthorized off road driving, and other recreation activities (USDA Forest Service 2002). The occurrence on the Mt Baldy is at limited risk of impacts to trail use and maintenance. Vegetation management treatments designed to reduce fuel loading along National Forest System Roads on the San Bernardino National Forest may also affect occurrences or habitat (Eliaison pers. comm.). Most reported populations outside of southern California also occur on public lands, including National Forest System and National Park Service lands (California Natural Diversity Database 2004).

Conservation and Management Considerations

The primary short-term conservation strategy for *Arabis dispar* is to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Survey all new occurrences of *Arabis dispar* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Arabis dispar* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Arabis dispar* in the Province using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.
- Work cooperatively with Caltrans to minimize impacts associated with maintenance of Hwy 18

along Cushenbury Grade.

Evaluation of Current Situation and Threats on National Forest System Lands

Arabis dispar is narrowly distributed and uncommon throughout southern California. This species is known from about 10 localities that are grouped in four general areas. None of these areas are currently well protected from identified threats. The most prominent threats are related to vehicular access, dispersed recreation and vegetation management. Based on the above analysis, *Arabis dispar* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	A	B	A

Arabis dispar is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Arabis dispar* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Implementation of the Carbonate Habitat Management Strategy will help conserve this species where it occurs in carbonate habitat, and the Pebble Plain Management Guide will help conserve the species where it occurs in pebble plain habitat. Consideration of the Suitable Use restricting vehicle travel to Forest Transportation System Roads and Designated Trails, along with Standards that protect rare species, and apply to recreation use also factor into the outcomes along with zoning and recommendations for Special Area designations.

Under Alternative 1, this species would be at continued risk of habitat impacts resulting from driving off Forest System roads and trails. No new lands are recommended for Special Area designations. The Mount Baldy area is zoned as Back Country Non-Motorized and Developed area Interface.

Under Alternative 2, the recommended Blackhawk RNA, and Back Country Non-Motorized land use zones at White Mountain and Rattlesnake Canyon would provide additional protection. In addition, the recommended wilderness on the east side of Mount San Antonio would provide additional protection.

Under Alternative 3, the recommended Blackhawk and Broom Flat candidate RNA's, Back Country Non-Motorized zoning at White Mountain and Rattlesnake Canyon, the recommended Heartbreak Ridge Wilderness and the recommended Arrastre Creek SIA would provide a high level of protection.

Under Alternative 4, Back Country Non-Motorized zoning at White Mountain and Rattlesnake would provide additional protection, however no RNA's or SIA's within habitat would be proposed, and the existing Back Country Non-Motorized zone on the east side of Mount San Antonio (Baldy) would become zoned as Back Country.

Under Alternative 4a, the recommended Blackhawk and Broom Flat candidate RNA's, Back Country Non-Motorized zoning at White Mountain, the recommended Heartbreak Ridge Wilderness (addition to the Bighorn Wilderness) and the recommended Arrastre Creek SIA would provide a high level of protection on the SBNF. The recommended wilderness on the east side of Sheep Mountain would provide a higher level of protection for the Mt. Baldy habitat on the ANF.

Under Alternative 5, no new special designations are recommended, and the east side of Mount San Antonio (Baldy) would change to Back Country zoning.

Under Alternative 6, the proposed Blackhawk and Broom Flat candidate RNA's, Back Country Non-Motorized zoning at Rattlesnake and White Mountain would provide protection to occupied habitat at these locations.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	B	B

The majority of this species range occurs on public land managed by the Forest Service or National Park Service. The types and levels of impacts to this species on National Forests outside the Province areas are similar to those on the SBNF; however impacts in these areas are of less concern because the species is regionally less rare to the north.

By maintaining the current distribution of *Arabis dispar* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Arabis dispar* to suffer a decline in its overall distribution.

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Arabis breweri var. pecuniaria

Arabis johnstonii

Arabis johnstonii

Arabis johnstonii Munz (Johnston's rock cress)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Arabis johnstonii is endemic to the southern San Jacinto Mountains in Riverside County (Rollins 1993).

This species is known from occurrences distributed in two distinct population centers at Garner Valley and about four miles to the east on the Desert Divide (California Natural Diversity Database 2004).

Distribution in the Planning Area

Most occurrences are on the San Bernardino National Forest. However, some of these occurrences also extend onto private land.

Taxonomy and Natural History

Arabis johnstonii is a dicotyledonous plant in the mustard family (Brassicaceae). This species flowers between February and June (California Native Plant Society 2001). *Arabis johnstonii* is a perennial with a woody caudex and leaf base remnants. There are several 1-2 dm stems that are erect or ascending and hairy. The leaves are 1-2 cm, basal, linear to narrowly oblanceolate, entire, and have a tapered base. Flower petals are purple. The style is 1-3 mm, slender, and persistent. Fruit are erect, 3-5 cm, and glabrous. The pedicel is ascending, 6-10 mm, and hairy. Seed are more or less round with a wide wing (Rollins 1993).

Habitat Distribution

This perennial plant grows in dry areas on clay and gravelly soils between 4,400 and 7,000 feet elevation (1350 and 2150 meters) (California Native Plant Society 2001; Rollins 1993). Plants are found in openings within chaparral, often on benches and knolls, and at the edges of meadows. The California Natural Diversity Database (2004) reports that this species occurs on granitic soils with Pleistocene, non-marine clay deposits.

In Garner Valley, *Arabis johnstonii* occurs on dry rocky knolls with gentle (2-10%) slopes, on shallow dark yellow-brown loam, with a subsoil of strongly subangular yellowish-red clay; this highly eroded clay substrate inhibits the successful germination of trees and shrubs, creating habitat openings very similar to the pebble plains of Big Bear area. Plants tend to be on slightly north-aspect slopes.

On the Desert Divide the habitat is very different from other occurrences. Here, soils are a shallow gray-brown loamy coarse sand, with a subsoil layer of light yellow-brown coarse gravelly-loamy sand. (Berg and Krantz 1982)

The habitat associations supporting *Arabis johnstonii* are narrowly distributed and are generally located in areas within active grazing allotments or on private land. In one of the grazing allotments, *Arabis johnstonii* grows in stock driveways and openings in the chaparral used by cattle. This species is abundant in some of these locations. In the second allotment, *Arabis johnstonii* grows in openings in chaparral uphill from the meadow, an area cattle naturally avoid. *Arabis johnstonii* may not be heavily disturbed at this location. Grazing takes place in or near the habitat at the end of the growing season, which may also minimize negative effects of grazing on the plants. *Arabis johnstonii* is found within at least three grazing enclosure fenced areas on one grazing allotment on National Forest System lands. Occurrences along the edge of the meadows in Garner Valley do not appear to be heavily impacted by cattle. (USDA Forest Service 2002).

Occurrence Status

Population sizes are not known for fourteen of the fifteen occurrences. The occurrences are distributed in two distinct population centers: Garner Valley within the San Bernardino National Forest (where the species is found within two grazing allotments) and about four miles west on the Desert Divide, along the Pacific Crest Trail.

Occurrences of *Arabis johnstonii* in the Quinn Flat area of Garner Valley are some of the densest populations (USDA Forest Service 2002).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Arabis johnstonii* (Johnston's rock cress)

Occurrence No.	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1982	South end of Garner Valley, Pine Meadow, East of Pine to Palms Hwy, San Jacinto Mountains. SBNF	RIV
2	U	1982	South of Kenworthy Sta., east of Thomas Mtn. to Palms Hwy, in Garner Valley, San Jacinto Mountains. PVT in SBNF.	RIV
3	U	1982	NW of Kenworthy Station, east of Pines to Palms Hwy, Garner Valley, San Jacinto Mtns. SBNF/PVT.	RIV
4	< 10,000	1982	Desert Divide Trail near Pine Mtn. and Pyramid Peak. San Jacinto Mtns. incl. portion of section 9. SBNF.	RIV
5	U	1982	Garner Valley, N side of Morris Ranch Rd., S. of Quinn Flat, San Jacinto Mtns. incl. SE section 23. SBNF.	RIV
6	U	1982	Just E of Quinn Flat, N of Morris Ranch Road, San Jacinto Mtns. SBNF.	RIV
7	U	1982	Northern portion of Quinn Flat, Garner Valley, San Jacinto Mtns. SBNF.	RIV
8	U	1982	Approx. 1 mi. E of Quinn Flat, N of Morris Ranch Road, W side San Jacinto Mtns. SBNF.	RIV
9	U	1937	Mapped along west slope of San Jacinto Peak. Land ownership: U	RIV
27029 (UCR)	U	1977	Quinn Flats, East End, Sec 23 (Derby/UCR). SBNF	RIV

*	U	1983	0.8 air-miles N of Pyramid Peak, T6SR4E9, 6,800' (Emmel/RSA). SBNF	RIV
*	U	1950	2 mi NW of Pipe Creek, 4,600'. (Munz/RSA) SBNF.	RIV
*	U	1968	Hemet Valley, San Jacinto Mts., lower edge of Yellow Pine Belt, alt. 4500 ft. (Ziegler/RSA)	RIV
35194 (UCR)	U	1968	Rocky hills at foot of old road to Old Morris Ranch (near Quinn Flats)	RIV
27149 (UCR)	U	1982	Pebble plain along bench E of Garner Valley, near Quinn Flats (Krantz/UCR)	RIV

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *RIV = Riverside County*
- *SBNF = San Bernardino National Forest*

Threats

Adverse effects to the species began in the late 1800's with increasing settlement and cattle grazing in the Garner Valley and, later, with construction of the Desert Divide Trail (Pacific Crest Trail) (U.S. Fish and Wildlife Service 1995).

Populations in the Garner Valley continue to be threatened by private land development and grazing, and are also threatened by recreational use and residential development (California Native Plant Society 2001). Most of the occurrences are located within one of two grazing allotments (Stephenson and Calcarone 1999), although there has not been any demonstrated adverse effects of grazing on this plant (U.S. Fish and Wildlife Service 1998). The clay substrate in the Garner Valley area is particularly susceptible to trampling and compaction by cattle when wet (U.S. Fish and Wildlife Service 1995).

The Quinn Flat / Morris Ranch area, likely the most important core of this species distribution, is also at risk of impacts associated with vegetation/fuels management projects.

Conservation and Management Considerations

The primary short-term conservation strategy for *Arabis johnstonii* is to prepare and implement a habitat management guide for this and associated species and to improve the knowledge of its distribution and

ecology. The following is a list of conservation practices that should be considered for this species:

- Write and implement a habitat management guide for *Arabis johnstonii* and associated sensitive species (e.g. *Penstemon californicus* and *Androsace elongata* ssp. *acuta*).
- Survey all new occurrences of *Arabis johnstonii* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Arabis johnstonii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Arabis johnstonii* in the Province using NRIS data collection standards.
- Monitor effects of grazing seasonality and intensity where this taxon occurs within allotments. If adverse effects are identified, consider modifying terms of permits to minimize effects.

Evaluation of Current Situation and Threats on National Forest System Lands

Arabis johnstonii is a restricted narrow endemic species, known only from two general areas in the southern San Jacinto Mountains. None of the known localities are well protected from identified threats. Grazing and vegetation management are the most prominent threats, although impacts related to trails use and maintenance are also identified.

Based on the above analysis, *Arabis johnstonii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	C	A

Arabis johnstonii is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The primary threats to this species on NFS lands are grazing and vegetation/fuels management, and it is not known to what extent the effects of these activities are adverse to this species' persistence.

Recommended monitoring of grazing effects on this species along with the development and implementation of a habitat management guide will help to assure viability. Trails use and maintenance along the Desert Divide/PCT will be a minor ongoing threat, equally under all alternatives.

Under Alternatives 1 and 2, this species would be at continued risk as a result of the lack of refugia from grazing on NFS lands combined with limited knowledge about the severity of the threat, and at continued risk as a result of likely vegetation treatments in the core of its distribution. Under Alternative 5, there would not likely be a substantial decrease in grazing, and identification and response to impacts would be relatively slow. Under Alternatives 2, 3, 4, 4a and 6, grazing would continue to pose a risk, at current to reduced levels, but an increase in knowledge and management would partially offset these risks. Risks associated with vegetation management would exist under all alternatives, however increased knowledge and management under Alternatives 2, 3, 4, 4a and 6 would largely offset this threat.

Under Alternative 3, the proposed Garner Valley Special Interest Area and the proposed wilderness designation for Pyramid Peak would provide increased protection for this species. Under alternative 5, areas east of Desert Divide currently zoned Back Country Non-Motorized (BCNM) would become Back Country, reducing protection and introducing potential new threats. Under Alternatives 4a and 6, increased Back Country Non-Motorized zoning and the recommended wilderness designation at Pyramid Peak would provide increased protection.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Portions of this species' range have been lost and continue to be lost as private land inholdings in Garner Valley are developed into residences and ranchettes. The potential for increased gaps in this species' distribution within Garner Valley is high, although this is not expected to put the portions of this population on NFS lands at risk of extirpation.

By maintaining the current distribution of *Arabis johnstonii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Arabis johnstonii* to suffer a decline in its overall distribution.

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Arabis parishii

Arabis parishii S. Watson (Parish's rock cress)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Arabis parishii is locally common, but its total distribution is restricted to the San Bernardino Mountains (Rollins 1993). The California Natural Diversity Database (2002) contains records for 45 occurrences.

Distribution in the Planning Area

All occurrences of *Arabis parishii* are on or adjacent to the San Bernardino National Forest. Occurrences are found in the vicinity of Onyx Peak, Clark's Summit, Sugarloaf Ridge, Big Bear Valley, Holcomb Valley, Coxey Meadows, Cushenbury Canyon, and other areas in the northern San Bernardino Mountains (California Natural Diversity Database 2004; Bennett 1979). A 1978 investigation by Tim Krantz stated that 2,888 acres of *Arabis parishii* habitat on the SBNF was identified (Krantz 1978).

Taxonomy and Natural History

Arabis parishii is a dicotyledon in the mustard family (Brassicaceae). This species is a perennial herb that blooms April–May (California Native Plant Society 2001). *Arabis parishii* responded to fire by resprouting after plants were burned with low intensity in the September 1999 Willow Fire on the San Bernardino National Forest. Plants were in flower the first spring after the fire. To date, no regeneration by seed has been observed in this location (USDA Forest Service 2002).

Arabis parishii is a perennial with a branched, underground caudex and fine multi-branched hairs. The several-many stems are tufted, simple, 3-14 cm, and slender with dense hairs below and more or less sparse hairs above. The leaves are gray with dense hairs. There are many basal leaves that are 5-15

mm, linear to linear-oblongate, and entire with an acute tip. The few cauline leaves are sessile, 5-10 mm, and linear (Rollins 1993).

Habitat Description

Arabis parishii occurs primarily on and adjacent to pebble plains, and also occupies pinyon juniper woodland and upper montane coniferous forest on hillsides, ridges, and other dry, sunny areas. It generally inhabits clay or (infrequently) carbonate soils (California Native Plant Society 2001, California Natural Diversity Database 2004, Rollins 1993). It is often found in association with other pebble plains and carbonate endemic plants, such as *Linanthus killipii* (California Natural Diversity Database 2002; U.S. Fish and Wildlife Service 2001a, 2001b).

Other associated species include *Eriogonum kennedyi* var. *austromontanum*, *Eriogonum wrightii*, *Pinus monophylla*, *Pinus murrayana*, *Pinus jeffreyi*, *Juniperus occidentalis*, *Cercocarpus ledifolius*, *Arenaria ursina*, *Castilleja cinerea*, *Ivesia argyrocoma*, *Artemisia tridentata*, *Bouteloua gracilis*, *Packera bernardina*, and *Echinocereus engelmannii* (Bennett 1979; California Natural Diversity Database 2002).

Pinyon juniper woodland and upper montane coniferous forest habitats are widespread throughout the plan area; however, these have been affected by altered fire regimes. Fire suppression has increased the likelihood of severe fires; it is unknown how *Arabis parishii* responds to intense burning. Pebble plain and carbonate habitats are much more restricted within the area. Carbonate habitat is affected by current and future mining activities. All of these habitats are impacted by a variety of recreational activities and Forest uses.

Occurrence Status

This plant occurs in large numbers within nearly all pebble plain complexes, and in small numbers in widely scattered occurrences on fine/flat carbonate soils and other poor soils with open vegetation structure. Most of the known occurrences are on the San Bernardino National Forest, however, several are on private land in Big Bear Valley. In areas on National Forest System land where *Arabis parishii* occurs with federally listed pebble plain species, *Arabis parishii* receives some protection. Some of these pebble plains have been fenced or otherwise protected from unauthorized vehicle travel.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Arabis parishii* (Parish's rock cress)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1980	N shore of Baldwin Lake, Bear Valley. Land ownership: California Department of Fish and Game	SBD
2	U	1990	Coxey Meadow, along slopes S of Coyote Flat to hilltop S of Mill Spring. Pebble plain w/ <i>Echinocereus engelmannii</i> , <i>Ivesia argyrocoma</i> , and <i>Eriogonum kennedyi</i> var. <i>kennedyi</i> . Threats: ORV use, grazing. SBNF.	SBD
3	U	1979	Near Snake Spring, ca. 1.3 mi. NE of Shay Mtn. w/ <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> . SBNF.	SBD
4	U	1990	Little Pine Flat, 0.3 mi. NE of Shay Spring. w/ <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> on clay soils with quartzite cobbles. SBNF.	SBD
5	U	1979	Jackrabbit Spring, along slope ca. 0.1 mi. S of the spring and the drainage it is tributary to. w/ <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> . SBNF.	SBD
6	U	1979	Canyon tributary to Willow Canyon, ca. 0.3 air mi. N of Burns Spring. w/ <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> . SBNF.	SBD
7	U	1979	N of Yokum Spring, ca. 1 mi. W of Rose Mine. w/ <i>Linanthus killipii</i> , <i>Echinocereus engelmannii</i> . SBNF.	SBD

8	U	1979	Broom Flat, E to Broom Spring. w/ <i>Pinus monophylla</i> , <i>Juniperus occidentalis</i> , <i>Cercocarpus ledifolius</i> , <i>Artemisia tridentata</i> , <i>Chrysothamnus nauseosus</i> , <i>Arenaria ursina</i> , <i>Linanthus killipii</i> . Some ORV damage along meadow edge extending toward Juniper picnic area. SBNF.	SBD
9	U	1978	Onyx Peak, from summit down NNW slope to ca. 8200'. w/ <i>Pinus monophylla</i> , <i>Juniperus occidentalis</i> , <i>Cercocarpus ledifolius</i> , <i>Eriogonum wrightii</i> , <i>Arenaria ursina</i> , <i>Castilleja cinerea</i> , <i>Ivesia argyrocoma</i> , <i>Phlox dolichantha</i> . SBNF (Portion at Summit = Priv.).	SBD
10	U	1979	Ridge ca. 2 mi. WNW of Onyx Peak. w/ <i>Castilleja cinerea</i> . SBNF.	SBD
11	U	1979	NW of Cienega Seca, ca. 1.35 mi. W of Onyx Peak. SBNF.	SBD
12	U	1978	Mapped ca. 2 mi. E of Onyx Peak along FR 1N01. SBNF.	SBD
13	U	1988	N and W of Sugarloaf, from NE edge of Moonridge to NE edge of Sugarloaf. Common on pebble plains and scattered w/in the pine forests btw the pebble plains. w/ <i>Quercus</i> sp., <i>Pinus monophylla</i> , <i>Cercocarpus ledifolius</i> , <i>Juniperus occidentalis</i> . Threats: ORV use, burro activity, development, invasive weeds. TNC preserve at Sawmill Pebble Plain, SBNF.	SBD

14	U	1988	S and E of town of Sugarloaf. NW of water tank. 'Deveg. site'. Pebble plains surrounded by conifer forest. w/ <i>Ivesia argyrocoma</i> , <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> , <i>Castilleja cinerea</i> , <i>Arenaria ursina</i> . ORV activities, pebble plain near water tank to S of town has been nearly denuded of vegetation due to ORV use. SBNF.	SBD
15	U	1977	W of Woodlands, 0.15 mi. N of intersection of Hwy 38 and Mitchell Lane. PVT.	SBD
16	U	1978	Woodlands area, from ca. center of town S and E along Deadman Ridge to Gocke Valley. On pebble plain or alluvial plain substrates w/ <i>Juniperus</i> sp., <i>Artemisia tridentata</i> , <i>Eriogonum wrightii</i> , <i>E. umbellatum</i> , <i>Gutierrezia sarothrae</i> , <i>Bouteloua gracilis</i> , <i>Echinocereus engelmannii</i> , <i>Linanthus killipii</i> , <i>Castilleja cinerea</i> , <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> . PVT, SBNF.	SBD
17	U	1978	Erwin Lake. On pebble plain w/ <i>Arenaria ursina</i> and <i>Echinocereus engelmannii</i> surrounded by <i>Pinus monophylla</i> , <i>Quercus chrysolepis</i> , <i>Cercocarpus ledifolius</i> , <i>Chrysothamnus nauseosus</i> , <i>Artemisia tridentata</i> . Threats: ORV disturbance is evident S of Baldwin Lake and S of Woodland. Areas E of Stocker Meadow being developed for homes. PVT, SBNF.	SBD

18	U	1977	Green Canyon, ca. 1.5 mi. SE of town of Sugarloaf and ca. 0.2 mi. SSE of Green Canyon Group Camp. SBNF	SBD
19	U	1979	Sugarloaf Ridge, from summit E to ridge N of Wildhorse Spring. On soils of white quartzite on red or darker alluvium. w/ <i>Pinus murrayana</i> , <i>Pinus flexilis</i> , <i>Juniperus occidentalis</i> , <i>Arctostaphylos patula</i> , <i>Chrysolepis semipervirens</i> , <i>Cercocarpus ledifolius</i> , <i>Chrysothamnus nauseosus</i> , <i>Castilleja cinerea</i> . Threats: ORV damage on summit E of Wildhorse Meadow. Grazing has been allowed along FR 2N93. SBNF.	SBD
20	U	1977	Wildhorse Meadows, ca. 0.5 mi. WSW of Wildhorse Spring. SBNF.	SBD
21	U	1977	Along ridge near Wildhorse Spring, from ca. 0.7 mi. S to 0.5 mi. SE of spring. SBNF	SBD
22	U	1977	E of Sugarloaf Mtn. on E side of Wildhorse Rd., ca. 1.2 mi. SSE of Wildhorse Spring. SBNF.	SBD
23	U	1977	S shore of Big Bear Lake, btw. Mallard Lagoon and Lakeview Dr. at Lagunita Lake. Pvt.	SBD

24	U	1978	S of Big Bear Lake, W of Red Ant Canyon near Aspen Glen Picnic Area. On pebble plain soils with <i>Pinus jeffreyi</i> , <i>Quercus kelloggii</i> , <i>Castilleja cinerea</i> , <i>Arenaria ursina</i> , <i>Ivesia argyrorcoma</i> . Much of historic population has been destroyed due to development. Horse trails = current threat. Land ownership: SBNF and Pvt.	SBD
25	U	1927	Pineknot, Bear Valley, S of Big Bear Lake. Land ownership: U	SBD
26	U	1977	Snow Point, E of Red Ant Canyon, Big Bear Lake. Land ownership: SBNF	SBD
27	U	1978	W of Furnace Canyon, ca. 4 mi. N of Fawnskin. SBNF.	SBD
28	U	1981	ca. 2.5 mi. N of Delamar Mtn., 1 mi. N of Hitchcock Spring. Limestone soils in openings on hilltops. w/ <i>Pinus monophylla</i> , <i>Juniperus occidentalis</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . SBNF.	SBD
29	U	1981	Near head of Furnace Canyon, 1.6 mi. NNW of Hitchcock Ranch. Limestone soils in openings on hilltops. w/ <i>Pinus monophylla</i> , <i>Juniperus occidentalis</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . SBNF.	SBD

30	U	1988	<p>Holcomb Valley area, inc. NW slope of Bertha Peak and E slope of Delamar Peak. Small pebble plains w/ <i>Eriogonum kennedyi</i> var. <i>austromontanum</i>, <i>Arenaria ursina</i>, <i>Ivesia argyrocoma</i>, <i>Castilleja cinerea</i>, + 9 other sensitive plants. A road bisects one pebble plain. Portion is owned by Boy Scouts of America. CDF is encouraging the Boy Scouts to plant pines on the pebble plains on their inholding. PVT, SBNF.</p>	SBD
31	U	1981	<p>Upper Holcomb Valley, from Wilbur Grave extending down Van Dusen Canyon. Mostly clay soils/ quartzite cobbles with limestone soils appearing in the west. w/ <i>Pinus jeffreyi</i>, <i>Juniperus occidentalis</i>, <i>Cercocarpus ledifolius</i>, <i>Arenaria ursina</i>, <i>Castilleja cinerea</i>, <i>Eriogonum kennedyi</i> var. <i>austromontanum</i>, <i>Ivesia argyrocoma</i>, <i>Phlox dolichantha</i>. Site disturbed by ORVs. SBNF.</p>	SBD
32	U	1979	<p>Fawnskin, on N side of Hwy 38 just E of town. On dense clay with Saragoza quartzite. w/ <i>Ivesia argyrorcoma</i>, <i>Castilleja cinerea</i>, <i>Eriogonum wrightii</i> in <i>Pinus jeffreyi</i> series. Site disturbed/threatened by development. PVT (= Moon Camp).</p>	SBD

33	U	1984	Castle Glen, SE end of Big Bear Lake. w/ <i>Arenaria parishii</i> , <i>Astragalus leucolobus</i> , <i>Castilleja cinerea</i> , <i>Mimulus exiguus</i> , <i>Mimulus purpureus</i> , <i>Castilleja lasiorhyncha</i> , <i>Phlox dolichantha</i> , <i>Packera bernardina</i> . Conservation easement over 124 acres held by Natural Heritage Foundation, however, most of this occurrence was outside of the easement and was lost to development.	SBD
34	U	1985	S shore of Big Bear Lake, E of Eagle Point. Threats: roads, vehicle damage, weeds, and residential development. Part of Eagle Point conservation (Lot K). PVT.	SBD
35	U	1978	Burnt Flat, ca. 0.5 mi. SSW of Mohawk Mine. w/ <i>Pinus monophylla</i> , <i>Quercus chrysolepis</i> , <i>Eriogonum kennedyi</i> , <i>Ceanothus cuneatus</i> . Western portion of population is crossed by several roads. SBNF.	SBD
36	U	1978	Arrastre and Union Flats, ca. 2.5 mi. N of Big Bear City. Pebble plains surrounded by Jeffrey pine forest and p/j woodland. Many other sensitive spp. ORV trails cross the population in many areas. PVT, SBNF.	SBD
37	U	1977	From Doble Mine to Jacoby Canyon, ca. 1.5 mi. NW of Baldwin Lake. SBNF.	SBD

38	U	1979	Johnston Grade, ca. 1 mi. E of Doble. Both sides of Hwy 18. Pebble plains surrounded by <i>Pinus monophylla</i> , <i>Chrysothamnus nauseosus</i> , <i>Artemisia tridentata</i> , <i>Yucca brevifolia</i> . Several rare ssp. present: <i>Arenaria ursina</i> , <i>Eriogonum kennedyi</i> var. <i>austromontana</i> , <i>Linanthus killipii</i> . ORV use and dumping are evident on PVT lands, possibly grazing too. PVT, SBNF.	SBD
39	U	1977	Van Dusen Canyon, ca. 1.5 mi. N of the E end of Big Bear Lake. SBNF.	SBD
40	U	1978	Gold Mountain, along W slope ca. 0.5 mi. from summit. Mapped as 4 separate polygons. On clay soils with quartzite cobbles. w/ <i>Arenaria ursina</i> , <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> . Possible ORV use. SBNF.	SBD
41	U	1978	Gold Mountain, ca. 0.5 mi. SSE of summit. Clay soils with quartzite cobbles. w/ <i>Ivesia argyrocoma</i> . Possible ORV activity. SBNF.	SBD
42	U	1988	SE slope of Gold Mtn., ca. 1 mi. SE from summit. Forest road bisects one of the pebble plains. Woodcutting and associated ORV activity also threaten site. Pebble plains surrounded by <i>Pinus monophylla</i> , <i>Juniperus occidentalis</i> . w/ <i>Arenaria ursina</i> , <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> , <i>Castilleja cinerea</i> , <i>Linanthus killipii</i> , <i>Ivesia argyrocoma</i> , <i>Echinocereus engelmannii</i> . SBNF.	SBD

43	U	1977	E of Big Bear City, N side of Hwy 18 btw. Pan Hot Springs and area N of the Baldwin Lake sewage facility. Associated with several other rare taxa. SBNF.	SBD
44	U	1978	Gold Hill, S of Baldwin Lake. ORV disturbance severe on ridge. w/ <i>Arenaria ursina</i> , <i>Echinocereus engelmannii</i> . Surrounding area: <i>Pinus monophylla</i> , <i>Quercus chrysolepis</i> , <i>Cercocarpus ledifolius</i> , <i>Chrysothamnus nauseosus</i> , <i>Artemisia tridentata</i> . PVT?, SBNF.	SBD
45	U	1991	Just E of Johnston Grade, 0.5 mi. S of Top Spring along N side of Smarts Ranch Road. Site is impacted by target shooting and ORV use. Major threat by proposed limestone mining. On carbonate substrate with <i>Pinus monophylla</i> , <i>Prunus fasciculatus</i> , <i>Yucca whipplei</i> , <i>Yucca brevifolia</i> , <i>Haplopappus linearifolius</i> , <i>Stipa speciosa</i> , <i>S. coronata</i> , <i>Oryzopsis hymenoides</i> , <i>Opuntia</i> spp., <i>Astragalus albens</i> , <i>Erigeron parishii</i> , <i>Echinocereus engelmannii</i> . One of the few sites where <i>A. parishii</i> is not found on clay/quartzite cobble substrate typical of pebble plains. SBNF.	SBD
*	U	1998	S side of FR 3N11. Fawnskin Quad. Plants found and mapped during surveys for proposed shooting areas. SBNF.	SBD

*	U	2000	W side of FR 3N11A in rocky backbone of small ridge E of small swale and 150' E of large topped Jeffrey pine. w/ <i>Antennaria dimorpha</i> , <i>Allium</i> sp., <i>Silene</i> sp., <i>Viola purpurea</i> . Surrounding area burned in 1999 Willow Fire. This small area burned only around edges. Area proposed for timber salvage sale, fuelwood cutting and replanting. Site is mapped and will be excluded from project activities. SBNF.	SBD
*	U	1998	W side of Hwy 18 at Nelson Ridge near a benchmark labeled 6225. Continues along Hwy in a SE direction for ca. ¼ mi., then continues up a ridgeline ca. 1/3 mi. W toward the Pacific Crest Trail. Pinyon-juniper woodland with Joshua trees. w/ <i>Dudleya abramsii</i> , ssp. <i>affinis</i> . SBNF.	SBD
*	70	2001	Pacific Crest Trail. North of the trail and within 300' of Van Dusen Canyon Rd. Pebble plain knoll with <i>Eriogonum wrightii</i> var. <i>subscaposum</i> , <i>Ivesia argyrocoma</i> , <i>Antennaria dimorpha</i> , <i>Senecio bernardinus</i> , <i>Abronia nana</i> ssp. <i>covillei</i> . SBNF.	SBD
*	20	2000	Holcomb Valley. South of 3N05. w/ <i>Senecio bernardinus</i> . Small scale mining, ORV use, mountain biking. SBNF.	SBD

*	40	2000	Big Bear Valley. ¼ mi. E and W of FR 3N32. Marginal pebble plain habitat w/ <i>Astragalus leucolobus</i> , <i>Ivesia argyrocoma</i> , <i>Eriogonum wrightii</i> var. <i>subscaposum</i> , <i>Senecio bernardinus</i> . Small scale mining, ORV use, but most of the site is fenced. SBNF.	SBD
*	30	2001	Holcomb Valley. SE of FR 3N16 near junction with 3N09. <i>Pinus jeffreyi</i> overstory with occasional <i>Cercocarpus ledifolius</i> . w/ <i>Eriogonum wrightii</i> var. <i>subscaposum</i> . Dispersed camping, mountain biking, hiking. Small scale mining claim overlies the area; also historically mined. Adjacent areas are campground/popular recreation area. SBNF.	SBD
138862 (UCR)	U	1998	Northwest of Holcomb Valley, flats at the upper end of the east fork of Dry Canyon, north of Holcomb Creek and southwest of Furnace Canyon. Near 34 ° 19' 41.8" N 116 ° 57' 16.7" W. T3N R1E E 1/2 SW 1/4 sec. 23. Elev. 7800 Feet (Soza/RSA)	SBD
*	U	1980	San Bernardino National Forest: above Cactus Flat, W of Hwy 18, N of Baldwin Lake. (Thorne/RSA)	SBD
*	U	1975	San Bernardino Mountains: San Bernardino National Forest, isolated tract, sec 23 near Sawmill Canyon. (Thorne/RSA)	SBD

*	U	1933	5 mi. beyond Box S. Spring, 5.5 miles SE of Lucerne Valley; 34°23'10"N 116°52'40"W (de Forest/RSA)	SBD
*	U	1976	On St Hwy 18, SBNF. Cushenbury Grade Summit. Elev. 6750 ft. T2N R2E S 5/6 34°17'18"N 116°48'45"W. (Davidson/RSA)	SBD
38103 (UCR)	U	1985	N slope, along Hwy 18, 1.5 mi. below the point where it begins descending toward the Mojave desert toward the Mojave Desert, 5 mi. above the National Forest, elev. 6200 ft. (Sanders/UCR)	SBD
20108 (UCR)	U	1978	Ridge above Lucerne Valley, T3N/R1W/S24, elev. 7600 ft. (Derby/UCR)	SBD
20112 (UCR)	U	1978	Sugarloaf Peak, along ridge near summit, T1N/R2E/S6, (Krantz/UCR)	SBD
20111 (UCR)	U	1979	Pavement Plains N of Hwy 18 and the lake, T2N/R2E/S6 (Krantz/UCR)	SBD
20110 (UCR)	U	1979	N and W of Hwy 18. Baldwin Lake (Krantz/UCR)	SBD
20113 (UCR)	U	1978	Quarry #2 of Pleuss-Stauber, E slope of spur, below clearing for road (Krantz/UCR)	SBD
120597 (UCR)	U	2001	S of Baldwin Lake, ca. 0.6 mi. SE of the jct. Of CA Hwy 38 and Shay Rd. Slopes near the Los Vaqueros de las Montanas Arena (Hill/UCR)	SBD

141436 (UCR)	U	1975	NW Holcomb Valley, just N of Holcomb Creek crossing 3N12, 5.9 mi. from Fawnskin (Latting/UCR)	SBD
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- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *ORV= off-road vehicle*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *TNC= The Nature Conservancy*

Threats

Although some of the pebble plain occurrences are protected, *Arabis parishii* is not protected where it occurs in unprotected pebble plains or off pebble plain habitat. At some locations, this species is adversely affected by vehicle use off forest system roads, mining operations, trampling, non-native species, woodcutting, dumping, and unauthorized shooting activities (California Natural Diversity Database 2004).

Conservation and Management Considerations

The primary conservation strategy for *Arabis parishii* is to implement the Pebble Plain Habitat Management Guide and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Implement strategies within the Pebble Plain Habitat Management Guide to the greatest extent practicable.
- Survey all new occurrences of *Arabis parishii* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Arabis parishii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least five years prior.
- Map known and new occurrences of *Arabis parishii* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Arabis parishii is a locally-common narrow endemic species known only to occur in the eastern San Bernardino Mountains, and primarily on pebble plains. Some of these pebble plains are protected from identified threats, although most others are not well protected.

Based on the above analysis, *Arabis parishii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	A	A	B	A	C	A

Arabis parishii is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The viability of this species is tied tightly to protection and management of pebble plain habitat, and to a lesser extent, carbonate habitat. Existing protections of these habitats for the benefit of the associated listed threatened and endangered plant species provide considerable baseline protection. With full implementation of the Pebble Plain Habitat Management Guide and the Carbonate Habitat Management Strategy, viability for this species on NFS lands is secure.

Consideration of the Suitable Use restricting vehicle travel to designated Forest System roads and trails, along with Standards related to rare plant management, mining, and recreation factor into the outcomes. The recommended Wildhorse and Arrastre RNA's, the recommended Sugarloaf wilderness, and the Gold Mountain and Coxe Critical Biological Zones (CBZ's), where applied, are critical to the outcomes. Presumed implementation of the Pebble Plain Habitat Management Guide is also key to these outcomes under all alternatives.

Under all alternatives occurrences within the existing North Baldwin/Holcomb Valley Special Interest Area would be managed within this designation. In alternatives 2-6, occurrences would receive additional protection from Standard S33 as new projects are proposed.

Under Alternative 1, pebble plain habitat in general, and *Arabis parishii* in particular, would continue to be at risk from unauthorized vehicle travel off Forest System roads and trails. There is an existing area zoned Back Country Non-Motorized at Little Pine Flat pebble plain that would provide some protection. There are no new recommended Special Area designations. Occurrences within the North Baldwin/Holcomb Valley SIA would continue to be managed under existing management, however they would not benefit from Standard S33 when new projects are proposed in this area.

Under Alternative 2, the Coxe and Gold Mountain Critical Biological land use zones, the Arrastre and Wildhorse recommended RNA's, the Sugarloaf proposed wilderness, and Back Country Non-Motorized zoning at Little Pine Flat and lower Sugarloaf would provide substantial protection for this species.

Under Alternative 3, the Coxe, Union, and Gold Mountain Critical Biological zones, the Arrastre and Wildhorse recommended RNA's, the Sugarloaf proposed wilderness, the Deep Creek proposed wilderness (including Little Pine Flat pebble plain) and Back Country Non-Motorized zoning at upper Arctic and Marble Canyons (where this species occurs on carbonate) would provide substantial protection for this species.

Under Alternative 4, the Coxe Critical Biological zone, Back Country Non-Motorized zoning at Little Pine Flat pebble plain, and the Sugarloaf proposed wilderness would provide protection for limited portions of the species range, however the important protections associated with RNA designations and the Gold Mountain Critical Biological zone would not occur.

Under Alternative 4a, the Coxe and Gold Mountain Critical Biological zones, Back Country Non-Motorized zoning at Little Pine Flat pebble plain, and the Arrastre and Wildhorse recommended Research Natural Areas would provide a high level of protection.

Under Alternative 5, there would be no Critical Biological zones recommended nor would other land use zoning provide any protection. There would be no new Special Area designations. Occurrences within the existing North Baldwin/Holcomb Valley SIA would continue to benefit from management within this area.

Under Alternative 6, Back Country Non-Motorized zoning across the range of the species, along with the Arrastre and Wildhorse Research Natural Areas and the Union, Gold Mountain and Coxe Critical Biological zones, and the Sugarloaf proposed wilderness would provide substantial protection.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	B	B	C	B

The pebble plain habitat for *Arabis parishii* on private lands in Big Bear Valley has been highly reduced and fragmented by residential and commercial development. The remaining fragments on private land continue to be lost as continued development occurs. This is an important but relatively minor portion of this species distribution. Loss on private lands is not expected to reduce the viability of the protected and

managed occurrences on the SBNF. By maintaining the current distribution of *Arabis parishii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Arabis parishii* to suffer a decline in its overall distribution.

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Arabis shockleyi

Arabis shockleyi Munz (Shockley's rock cress)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 3-2-1

General Distribution

Arabis shockleyi occurs in Inyo and San Bernardino counties in southeastern California and in western Nevada. In California, *Arabis shockleyi* is primarily distributed across the north slope of the San Bernardino Mountains, but it also occurs on the southern slopes of Bertha Ridge, in Rattlesnake Canyon, the Bighorn Mountains Wilderness and the Last Chance Range and Cottonwood Mountains of Death Valley National Park (California Natural Diversity Database 2004). This species is strongly associated with carbonate soils, and possibly carbonate endemic.

Distribution in the Planning Area

Fifty-six occurrences of *Arabis shockleyi* have been documented within the plan area; all of these occur on the San Bernardino National Forest (SBNF) (California Natural Diversity Database 2004). Occurrences of *Arabis shockleyi* are distributed across carbonate areas in the northeastern portion of the Mountaintop Ranger District. Occurrence locations include White Mountain, Furnace Canyon, Tip Top Mountain, Mineral Mountain, Nelson Ridge, south of Bertha Ridge, Crystal Creek, Marble Canyon, Blackhawk Mountain, Arctic Canyon, north of Holcomb Valley, and Rattlesnake Canyon.

Taxonomy and Natural History

Arabis shockleyi is an dicotyledon in the mustard family (Brassicaceae). This perennial herb blooms between May-June (California Native Plant Society 2001). The taxon has a simple caudex with multi-branched fine, dense hairs. Stems are 1-few, simple or branched above, 1.5-4 dm, stout, and grayish white. Leaves are also grayish white. Basal leaves are crowded, 1-2 cm and spoon-shaped to obovate

with acute tips. There are many overlapped cauline leaves, each 1-2 cm and widely lanceolate. Leaf bases may or may not be more or less lobed, and stems may or may not be clasping. Petals are pink, more or less linear and 8-11 mm long. Fruits are crowded, ascending, 5-8 cm, straight to outcurved, with or without sparse hairs. The pedicel is ascending, 8-12 mm long, straight, and with dense hairs. Styles are more or less inconspicuous, and the plant has oblong, plump seeds that may or may not have inconspicuous wings (Rollins 1993).

Habitat Description

Arabis shockleyi grows in openings on limestone or quartzite soils usually on ridges or rocky outcrops in pinyon-juniper woodland between 3,350 and 6,500 feet elevation. The plant is most commonly found on north-facing, often steep slopes in loose or fine-textured carbonate substrate. Suitable habitat for *Arabis shockleyi* within the province occurs on the north slope of the San Bernardino Mountains, Bertha Ridge, Upper Holcomb Valley, Rattlesnake Canyon, and the southern portion of the Bighorn Mountains Wilderness on the SBNF. The primary threat to habitat for *Arabis shockleyi* is large- and small-scale limestone mining operations, which have resulted in habitat loss and degradation across the north slope of the San Bernardino Mountains. Vehicle use off of designated roads also threatens habitat.

Within the plan area, *Arabis shockleyi* co-occurs with several other special-status species associated with carbonate soils, including *Eriogonum ovalifolium* var. *vineum* (Federally Endangered), *Oxytheca parishii* var. *goodmaniana* (Federally Endangered), *Astragalus albens* (Federally Endangered), *Erigeron parishii* (Federally Threatened), *Abronia nana* ssp. *covillei* (Forest Service Sensitive), *Eriogonum microthecum* var. *corymbosoides* (Watch List), and *Hulsea vestita* ssp. *parryi* (Watch List).

Occurrence Status

There are 81 documented occurrences of *Arabis shockleyi*, 29 of which have been recorded in CNDDDB (California Natural Diversity Database 2004). While site condition and population size is unknown for most occurrences, previous and ongoing limestone mining operations have threatened, degraded or extirpated many *Arabis shockleyi* occurrences on the North Slope of the San Bernardino Mountains. The number of individuals per occurrence appears to be low with plants localized in small areas, but it is unclear whether this distribution pattern is natural or a result of impacts from Forest uses. All documented occurrences are presumed extant; however, it is likely (based on habitat associations) that occurrences have been and continue to be impacted by mineral extraction activities and other Forest uses.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Arabis shockleyi* (Shockley's Rock Cress)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
4	U	BLM 1980 (map)	Lucerne Valley, South of Lucerne Lake. Map detail is only source of info – very generalized. Needs field work. U	SBD
5	U	1986	Northeast slope of White Mountain, about 1 mile (1.6 km) east of North Peak, San Bernardino Mountains. Needs field work. SBNF, PVT	SBD
6	50+	1988	Northwest of Holcomb Valley, 1.3 km (0.8 mi) WNW of Hitchcock Ranch. SBNF	SBD
7	U	1988	Furnace Canyon, southeast of Furnace Spring, San Bernardino Mountains. PVT – Pfizer limestone mining operation.	SBD
8	24 in 2001	1979, 2001	East of Crystal Creek, on switchbacks of Pleuss Stauffer grade below Curve 11, c.a. 3.2 km NW John Survey Mark. SBNF, PVT	SBD
9	U	1988	East of Arrastre Creek and north of road to Tip Top Mountain. Rose Valley (USFS Road 3N03). SBNF, PVT	SBD

10	U	1979	Tip Top Mountain from Summit West about 1.2 mi. (2 km). SBNF, PVT	SBD
11	U	1979	Round Valley Saddle, southwest of Rose Mine. SBNF	SBD
12	U	1979	Rattlesnake Canyon, 1 mile southeast of Rose Mine. SBNF	SBD
13	U	1988	North (south-facing) slope of Rattlesnake Canyon, approx. 0.5 mi SE of Mineral Mountain along Road 2N02. Needs fieldwork. SBNF	SBD
14	U	1988	South of Road 2N02, approx. ¼ mile east of Rattlesnake Canyon crossing, approx 1.5 air miles WNW of Bain Ranch, NE of Heartbreak Ridge. Needs fieldwork. SBNF	SBD
15	U	1992	About 1 mile west of Hwy 18 on USFS road 3N61. Northwest slope of Nelson Ridge, near Jacoby Spring. SBNF	SBD
16	U	197?	North-facing slope of Marble Canyon, approx. 0.5 km (0.3 mi) southeast of Marble Canyon pit. Needs fieldwork. SBNF	SBD

17	U	1882	Cushenbury Springs. Needs fieldwork. U	SBD
18	U	1989	North slope of the San Bernardino Mountains; from Whiskey Springs N to Monarch Flat and from Blackhawk Mountain W to Mohawk Mine. SBNF, PVT	SBD
19	U	197?	West of Blackhawk Canyon, 1 km (0.6 mi.) north of Silver Peak. Needs field work. U	SBD
20	U	1979	Terrace Springs vicinity, from springs south 1 km (0.6 mi) and west 0.8 km (0.5 mi). Needs field work. U	SBD
21	U	1992	Ridge north of Smarts Ranch Road, south of Top Spring. Extending from $\frac{3}{4}$ mile west of Horsethief Flat south to Smarts Ranch Road and continuing along the ridge southeast to end of ridge. SBNF, PVT	SBD
22	U	197?	North slope of Nelson Ridge, 0.4 km (0.2 mi) northwest of Squirrel Spring. Needs fieldwork. U	SBD

23	Scarce	1996	Upper Furnace Canyon, about 0.7 mi up from confluence with Wild Rose Canyon, north slope San Bernardino Mountains. PVT?	SBD
24	U	1996	About 0.1-0.5 mile west of the mouth of Arctic Canton, north slope of the San Bernardino Mountains. PVT?	SBD
25	U	1993	Northeast slope of Mineral Mountain about 0.3 mile ENE of Blue Cut, San Bernardino Mountains. 0.25 mile northwest of old homestead near end of Mound Spring Road off of Forest Road 2N91 (Viscera Springs Road) SBNF	SBD
26	U	1996	Ridgetop east of Marble Canyon and northwest of Burnt Flat,ridgeline above Mitsubishi mining operation. San Bernardino Mountains. SBNF	SBD
27	U	1995	Along ridge north of Holcomb Valley and west of upper Holcomb Valley, San Bernardino Mountains. SBNF	SBD

28	Abundant in 1998; c. a. 160 in 2001	1996, 1998, 2001	White Mountain, just north of North Peak, San Bernardino Mountains- along northwest-facing slope about 400 m NNW of North Peak near old gold quarry. SBNF	SBD
29	6 in 2001	1994, 2001	White Mountain, along ridge about 0.5 mile NNW of South Peak, San Bernardino Mountains – c.a. 0.4 km SW of summit of White Mountain Peak near Forest Road 3N17. SBNF	SBD
*	15	2001	Pacific Crest Trail, 1.5 mi. up trail from PCT crossing with Van Dusen Canyon Road. Occ. just past sharp north-south bend in trail. North-facing slope. San Bernardino Mtns. SBNF	SBD
*	> 5	1998	NW of Blackhawk Mountain on Forest Road 3N36. San Bernardino Mtns. SBNF	SBD
*	> 5	1998	South-facing steep rocky slope, SE of Mineral Mountain, N of Rattlesnake Canyon, N of Forest Road 2N02. San Bernardino Mtns. SBNF	SBD
*	> 5	1998	NNW of Holcomb Valley, just south of Forest Road 3N54 in sec.30. San Bernardino Mtns. SBNF	SBD

*	> 5	1998	Just east of John Peak summit on rocky cobbly slope. San Bernardino Mtns. SBNF	SBD
*	> 5	1998	Cobbly north-facing upper steep slope E of Marble Canyon, NE of Marble Canyon Pit. San Bernardino Mtns. PVT-Mitsubishi Cement Corp.	SBD
*	> 5	1998	Rocky upper north-facing slope NE of Marble Canyon pit. San Bernardino Mtns. PVT-Mitsubishi Cement Corp.	SBD
*	U	1998	Rocky upper northeast-facing slope S of Terrace Springs and NW of Horsethief Flat. San Bernardino Mtns. SBNF	SBD
*	> 5	1998	Steep north-facing rocky slope downslope from 5,298' peak; south of road from Marble Canyon to Cushenbury Pit. San Bernardino Mtns. PVT-Mitsubishi Cement Corp.	SBD
*	> 5	1998	North-facing, upper slope near ridgetop of 6,005' peak, E of Marble Canyon Pit. San Bernardino Mtns. PVT-Mitsubishi Cement Corp.	SBD

*	< 5	1998	White Mountain Ridge, steep, cobbly southwest-facing colluvial slope approx. 1/3 mile SW of White Mtn peak. San Bernardino Mtns. SBNF	SBD
*	< 5	1998	SW-facing rocky slope, E of Upper Holcomb Valley, N of FR 3N83 and SW of John Peak. San Bernardino Mtns. SBNF	SBD
*	< 5	1998	SW-facing steep rocky talus slope NW of Arctic Canyon. San Bernardino Mtns. PVT- Mitsubishi Cement Corp.	SBD
*	> 5	1998	Furnace Canyon, NE-facing steep scree slope in old limestone quarry. S of mining road and SW of Furnace Canyon-Wild Rose Canyon confluence. San Bernardino Mtns. PVT- Mitsubishi Cement Corp.	SBD
*	< 5	U	NE-facing rocky upper slope S of Marble Canyon Pit. Above old limestone quarry. San Bernardino Mtns. SBNF	SBD
*	> 5	1998	Moderately steep limestone cobbly slope above trail to Furnace Canyon. San Bernardino Mtns. PVT- Mitsubishi Cement Corp.	SBD

*	< 5	1998	N-facing mountainside directly upslope of Marble Canyon Quarry Pit. San Bernardino Mtns. SBNF	SBD
*	> 5	1998	Furnace Canyon, E-facing slope, SW of mine. San Bernardino Mtns. PVT	SBD
*	> 5	U	Steep mountainside just above E fork of Furnace Canyon. San Bernardino Mtns. PVT	SBD
*	> 5	1998	Mountainside above E fork of Furnace Canyon. Just east of above occurrence. San Bernardino Mtns. PVT	SBD
*	> 5	1998	Ridgetop E of E fork Dry Canyon and W of Forest Road 3N17 near SBNF boundary. SBNF	SBD
*	< 5	1998	NW-facing slope S of Forest road 3N54, approx. ¾ mile W of John Peak. San Bernardino Mtns. SBNF	SBD
*	> 5	1998	On ridgetop just east of 7,994' peak S of Forest Road 3N54, approx. ¾ mile W of John Peak. San Bernardino Mtns. SBNF	SBD
*	> 5	1998	NE-facing slope on ridge between Wild Rose Canyon and Arctic Canyon, NW of John Bull Flat. San Bernardino Mtns. SBNF	SBD

*	< 5	1998	N-facing steep slope E of Horsethief Flat, NE of Top Spring, and N of Bighorn Mountains Wilderness boundary. San Bernardino Mtns. SBNF	SBD
*	< 5	1998	Ridgetop saddle near 6,300' peak, just west of Bighorn Mtns Wilderness boundary, SE of Top Spring, and NE of Smarts Ranch Road. San Bernardino Mtns. SBNF	SBD
*	< 5	1998	S-facing slope of Bertha Ridge, N of Big Bear City, San Bernardino Mtns. SBNF	SBD
*	< 5	1998	S-facing slope of Bertha Ridge, N of Big Bear City, San Bernardino Mtns. Just west of above occurrence. SBNF	SBD
*	> 5	1998	Gravelly slope above Forest Road 3N36 on north slope of Blackhawk Mtn, San Bernardino Mtns. SBNF	SBD
*	< 5	1998	Rocky graduated NW-facing slope S of Monarch Flat on A spur road of Forest Road 3N36. San Bernardino Mtns. PVT-Cushenbury Mine Trust	SBD

*	> 5	1998	NW-facing rocky slope near ridgetop W of western terminus of A spur road of Forest Road 3N36. San Bernardino Mtns. PVT-Cushenbury Mine Trust	SBD
*	< 5	1998	NE-facing rocky slope NE of Monarch Flat north of intersection of Forest Road 3N36 and road leading NE out of Monarch Flat. North of SBNF boundary. San Bernardino Mtns. BLM?	SBD
*	> 5	1998	Rocky slope near ridgetop in Monarch Flat, south of Forest Road 3N36. San Bernardino Mtns. On border of SBNF and PVT land – under lease by Cushenbury Mine Trust.	SBD
*	> 5	1998	Steep rocky slope above Forest Road 3N36 between Monarch Flat and Blackhawk Mountain. San Bernardino Mtns. SBNF	SBD
*	< 5	1998	S-facing slope of Bertha Ridge approx. ½ mile E of Blue Quartz Mine. San Bernardino Mtns. SBNF	SBD
*	< 5	1998	S-facing gradual slope of Bertha Ridge near base. N of Hwy 38, SW of Blue Quartz Mine. San Bernardino Mtns. SBNF	SBD

*	> 5	1998	Rocky upper slope near ridgetop SE of Terrace Springs. San Bernardino Mtns. SBNF	SBD
*	> 5	1998	N-facing mountain slope near mapped 5,469' peak. Due south of Terrace Springs. San Bernardino Mtns. SBNF	SBD
*	< 5	U	Steep E-facing slope S of Marble Canyon Pit. San Bernardino Mtns. SBNF-Cushenbury Mine Trust?	SBD
*	> 5	1998	Steep S-facing slope of Blackhawk Mtn, < ¼ mi. N of Forest Road 3N57. North of old mine. San Bernardino Mtns. SBNF	SBD
*	U	U	Steep S-facing slope of Blackhawk Mtn, < ¼ mi. N of Forest Road 3N57. W of old mine. San Bernardino Mtns. SBNF	SBD
*	< 5	1998	N-facing steep rocky slope in SW/NE-oriented tributary canyon of Cushenbury Canyon. Due south of Cushenbury Pit. San Bernardino Mtns. SBNF, Mitsubishi Cement Corp.	SBD

*	< 5	1998	Rocky slope near base of Rose Peak by Forest Road 2N61 just north of intersection of Forest Roads 2N61 and 2N89Y. San Bernardino Mtns. SBNF	SBD
*	< 5	1998	Rocky upper slope of SE-facing ridge SW of Rose Peak. San Bernardino Mtns. SBNF	SBD
*	> 5	1998	Bench area on steep E-facing slope of Mineral Mountain. San Bernardino Mtns. SBNF-Bighorn Mountains Wilderness	SBD
*	> 5	1998	Bench area on steep E-facing slope of Mineral Mountain. Just W of occurrence above. San Bernardino Mountains. SBNF-Bighorn Mountains Wilderness	SBD
*	< 5	1998	At base of steep slope just above small wash in Rattlesnake Canyon. W of Forest Road 2N02. San Bernardino Mtns. SBNF	SBD
*	< 5	1998	Base of SW-facing slope N of Tip Top Mtn Road near Rose Mine Valley. San Bernardino Mtns. SBNF	SBD

*	< 5	1998	Upper slope near SE-facing ridgetop N of Tip Top Mtn Road near Rose Mine Valley. San Bernardino Mtns. SBNF – may be in Bighorn Mountains Wilderness.	SBD
*	< 5	1998	W-facing slope near ridgetop 1/8 mi. NE of Tip Top Mtn Road near Rose Mine Valley. San Bernardino Mtns. SBNF	SBD
*	< 5	1998	N-facing rocky slope approx. 1 mile N of Forest Road 2N02 between Arrastre Creek and Rose Mine Valley. San Bernardino Mtns. SBNF-Bighorn Mountains Wilderness	SBD
*	< 5	1998	N-facing steep rocky slope approx. ¼ mile E of Arrastre Creek, 1 mile from Forest Road 2N02 and < 1/8 mile from Bighorn Mountains Wilderness boundary. San Bernardino Mtns. SBNF	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *PVT = Private land*
- *NPS = National Park Service*
- *SBD = San Bernardino County*

Threats

The main threat to occupied and suitable habitat for *Arabis shockleyi* is mining operations. Several occurrences are found on or adjacent to land owned or claimed by mining interests, and future limestone extraction activities could lead to further habitat loss and extirpation. The other substantial threat to *Arabis shockleyi* is vehicle use off of designated Forest roads.

Conservation and Management Considerations

The primary conservation strategy for *Arabis shockleyi* is to implement the Carbonate Habitat Management Strategy. The following is a list of conservation practices that should be considered for *Arabis shockleyi*:

- Implement the Carbonate Habitat Management Strategy.
- Survey all new occurrences of *Arabis shockleyi* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Arabis shockleyi* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least five years prior.
- Map known and new occurrences of *Arabis shockleyi* in the southern California National Forests using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Arabis shockleyi is narrowly distributed on carbonate soils of the northern San Bernardino Mountains and southeastern Sierra Nevada. Within this range it is widespread but rarely abundant. While some of the recorded occurrences are vulnerable to identified threats, many are remote and inaccessible to vehicle impacts. Much of the suitable habitat distributed across the carbonate areas of the forest are also not vulnerable to vehicle impacts. Mining impacts will be addressed at the project level, and will be guided by provisions of the Carbonate Habitat Management Strategy.

Based on this analysis, *Arabis shockleyi* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Arabis shockleyi is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the

alternatives would not result in a substantial change in conditions for this taxon. *Arabis shockleyi* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Arabis shockleyi* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Arabis parishii

Arctostaphylos cruzensis

Arctostaphylos cruzensis

Arctostaphylos cruzensis Roof (Arroyo de la Cruz manzanita)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2; S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B, R-E-D Code 2-2-3

General Distribution

Arctostaphylos cruzensis is endemic to coastal sites in southern Monterey and northwestern San Luis Obispo Counties. Fewer than seven occurrences are known, ranging in size from five plants to an estimated 10,000 individual plants (California Natural Diversity Database 2004). Four occurrences are on land owned by the Hearst Corporation and the habitat here is not in a downward trend. One location adjacent to Highway 1 (just south of the bridge over Arroyo de la Cruz) appears to be extirpated. No *Arctostaphylos cruzensis* was detected during a survey in 2002.

Of the 16 occurrences included in RAREFIND (California Natural Diversity Database 2004), nine are probably occurrences of *Arctostaphylos osoensis* (Wilken 2002).

Seven of these nine occurrences are on private land in the Hollister Peak area and two are found in Morro Bay State Park. This new information indicates that the historic and current range of *Arctostaphylos cruzensis* is best described as being from Pacific Valley on the Monterey coast to Cambria in San Luis Obispo County, a distance of about 35 miles.

Distribution in the Planning Area

Two occurrences are reported from Los Padres National Forest. One occurrence of *Arctostaphylos cruzensis* is near the Pacific Valley Ranger Station on the Los Padres National Forest (Matthews 1997, California Natural Diversity Database 2004). This 'occurrence' consists of a single clone, or perhaps as many as five plants. The single clone/clump what was located here was severely damaged during the 2000 Plaskett Fire. As of December 8, 2003, the plant (or small collection of plants) was still alive. In

November of 2002, cuttings were taken for propagation at the Santa Barbara Botanic Garden. In December 2003, 22 rooted cuttings were transplanted back on to the site in Pacific Valley. *Arctostaphylos cruzensis* is also included on the Santa Barbara Botanic Garden's Conservation Collection (Painter 2004).

The California Natural Diversity Database (2004) lists a second occurrence on the Los Padres National Forest that is known only from a 1962 collection on Plaskett Ridge Road in the Santa Lucia Mountains. A survey of this area in 2002 failed to detect any *Arctostaphylos cruzensis* and a subsequent inspection of the collection at the University of California, Santa Barbara, determined that the material collected in 1962 (Breedlove 2129) is likely *A. rosei* rather than *A. cruzensis*.

Taxonomy and Natural History

Arctostaphylos cruzensis is a spreading, decumbent, evergreen shrub, 4 to 39 inches (0.1-1.0 m) tall in the heather family (Ericaceae). The lower trunk is reddish with peeling bark. The twigs are tomentose with bristles. The leaves are 0.6 to 1.2 inches (1.5-3 cm) long, oblong-ovate, strongly overlapping, bright green, and sessile. The inflorescence is dense with 1-3 branches. The bracts are leaf-like, lanceolate to lanceolate-ovate, and 0.2 to 0.6 inches (5-15 mm) long. The corolla is 0.3 inches (7-8 mm) long, with a tapered throat and white-tomentose ovary. The fruits are 0.3 to 0.4 inches (8-10 mm) wide and hairy.

Arctostaphylos cruzensis is placed in the Foliobracteata section, a group that contains several other range-restricted manzanitas, and is distinguished from closely related species by the absence of a basal burl, strongly overlapping leaves with both surfaces alike, rough bark, and sparse bristly twigs (Wells 1993).

Arctostaphylos cruzensis does not sprout after fire. Plants can form large clones by rooting along the stem. This species may be self-incompatible or only weakly self-compatible and if so it makes it unlikely that a small number of shrubs (1-5) can produce a viable population of *Arctostaphylos cruzensis*.

Habitat Description

Arctostaphylos cruzensis occurs on soils derived from sandstone in several distinct vegetation types: broadleaved upland forest, coastal bluff scrub, closed-cone conifer forest, chaparral, coastal scrub, and valley-foothill grassland (California Native Plant Society 2001). Wells (1993) describes habitat for this species as sandy bluffs below 500 feet (150 meters). The plant(s) found on the Los Padres National Forest is found at the edge between non-native grassland and a narrow strip of maritime chaparral.

Redwood and coast live oak are nearby. *Arctostaphylos tomentosa* ssp. *rosei* is the dominant shrub in the chaparral. *Achillea millefolium* and *Pteridium aquilinum* var. *pubescens* are with *Arctostaphylos cruzensis*. *Briza major* is the dominant species in the grassland. Below the grassland is coastal sage scrub dominated by *Baccharis pilularis* ssp. *consanguinea*.

In the Arroyo de la Cruz area, *Arctostaphylos cruzensis* sometimes occurs in nearly pure stands though more often it is found with dwarfed forms of *Adenostoma fasciculatum* and other chaparral shrubs such as *Arctostaphylos tomentosa* and *Arctostaphylos hookeri* ssp. *hearstiorum* (Keil and McLeod 1989).

Occurrence Status

Arctostaphylos cruzensis is a plant of limited distribution, known from about seven extant occurrences. Population trends are mostly unknown (California Natural Diversity Database 2004), and damage to the single plant found on National Forest System land has reduced its vigor [a large clone that once measured about 21 feet by 12 feet (Fairfax collection notes from 1977) is now reduced to what appears to be five separate plants about three feet across, each with several branches.]

The four occurrences of *Arctostaphylos cruzensis* in the Arroyo de la Cruz area consist of over 10,000 shrubs (California Natural Diversity Database 2004). These occurrences appear to be secure and in the absence of changes in land use are likely to remain secure (Keil and McLeod 1989).

There is no current information on the population status of occurrences of *Arctostaphylos cruzensis* located in the Hollister Peak area though Keil and McLeod (1989) noted that there are some relatively large occurrences of *Arctostaphylos cruzensis* at this location. However, it is possible that the plants found on and near Hollister Peak are actually *Arctostaphylos osoensis*. *Arctostaphylos osoensis* had not been described at the time that Ben Bolt made determinations regarding the taxonomy of these plants in 1936 (Wells 1992). If the occurrences of *Arctostaphylos cruzensis* found on Hollister Peak are in fact *Arctostaphylos osoensis* then the remaining occurrence of *Arctostaphylos cruzensis* found in the Arroyo de la Cruz area and on NFS land become increasingly important for the conservation of the species.

OCCURRENCE DATA of *Arctostaphylos cruzensis* (*Arroyo de la Cruz manzanita*) on and adjacent to National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County

1	U	U	1984	EITHER SIDE OF ARROYO DE LOS CHINOS NEAR MOUTH, FROM YELLOW HILL NORTH ABOUT 1 MILE, NORTH OF ARROYO DE LA CRUZ. MANY COLONIES MAPPED ALONG BOTH SIDES OF ARROYO DE LOS CHINOS AND AROUND YELLOW HILL, T25S/R06E/R27	SLO
3	U	> 200 in 1981, 10,000 in 1983	1983	RIDGE SOUTH OF ARROYO DE LA CRUZ IN VICINITY OF CINNABAR VABM, ABOUT 1-1.5 MILES EAST OF HIGHWAY 1 AT MOUTH OF ARROYO. COLONIES OCCUR BOTH NORTH AND SW OF CINNABAR VABM. 160-580 FT. ELEVATION. MAPPED AS SEVEN POLYGONS AT CNDDDB, T25S/R06E/S36	SLO
5	U	100+ in 1981	1981	RIDGE SOUTH OF THE MOUTH OF ARROYO DE LA CRUZ, FROM VABM LA CRUZ TO ABOUT 0.5 MILE EAST, NORTH OF SAN SIMEON. NUMEROUS COLLECTIONS FROM NEAR MOUTH OF ARROYO DE LA CRUZ ATTRIBUTED TO THIS SITE. 180-240 FT ELEVATION, T26S/R06E/	SLO

				S02	
6	U	1 in 1977	1977	ABOVE PACIFIC VALLEY RANGER STATION, ABOUT 0.5 MILE EAST OF HIGHWAY 1, NORTH OF CAPE SAN MARTIN. JUST ABOVE GARBAGE DUMP, T23S/R05E/S19	MON
7	U	U	1962	0.4 MILE EAST OF HIGHWAY 1 ON PLASKETT RIDGE ROAD, NORTH OF CAPE SAN MARTIN, SANTA LUCIA MOUNTAINS. POPULATION MAPPED AT 500 FT. ELEVATION TO MATCH MILEAGE GIVEN IN SOURCE DATA, T23S/R05E/S19	MON
8	U	U	1889	SAN SIMEON. EXACT LOCATION NOT KNOWN; MAPPED IN GENERAL VICINITY OF SAN SIMEON, T26S/R07E/S14	SLO
9	U	U	1965	CAMBRIA, AMONG PINES NORTH OF TOWN. MAPPED IN VICINITY OF THE PINUS RADIATA STAND NORTH OF CAMBRIA, T27S/R08E	SLO

10	U	U	1963	1.5 MILES SOUTHEAST OF MOUTH OSOS CREEK, EAST OF MORRO BAY. SITE INCLUDES COLLECTIONS FROM "2 MILES SSW OF HOLLISTER PEAK", "LOS OSOS VALLEY... ROLLING COUNTRY", AND "LOW RIDGE BORDERING LOS OSOS VALLEY"., T30S/R11E	SLO
11	U	U	1936	2.4 MILES EAST OF HOLLISTER PEAK, EAST OF MORRO BAY, T30S/R11E	SLO
12	U	Hundreds in 1984	1984	SADDLE BETWEEN HOLLISTER PEAK AND BLACK MOUNTAIN, MORRO BAY, T30S/R11E/S04	SLO
13	U	U	1966	ON SOUTH-FACING SLOPE OF BLUFFS NEAR TOP OF LOS OSOS MESA, A FEW MILES ESE OF MORRO BAY. MAPPED BETWEEN HIGHWAY 1 AND LOS OSOS VALLEY ROAD AND EAST OF TURRI ROAD, T30S/R11E	SLO
15	U	< 100 in 1982	1982	SW PART OF CERRO CABRILLO, MORRO BAY, T30S/R11E/S05	SLO

16	U	U	1982	APPROX 0.5 MI W OF HOLLISTER PK, MORRO BAY, T30S/R11E/S04	SLO
17	U	U	1982	S PART OF HOLLISTER PK, MORRO BAY, T30S/R11E	SLO
18	U	> 1000	1985	SOUTH OF MORRO BAY, RIDGE BETW HAZARD CYN, ISLAY CYN., T30S/R10E/S25	SLO
19	U	U	U	ARROYO DE LA CRUZ, ALONG N-FACING SLOPES ABOUT 2.2 AIR MILES EAST OF HIGHWAY 1, NORTH OF SAN SIMEON. MAPPED ALONG UPPER SLOPES ALONG THE SOUTH SIDE OF ARROYO, ABOUT 0.8 MILE ESE OF THE CINNABAR VABM., T25S/R06E/S36	SLO

- *U = Unknown.*
- ** = an occurrence number has not been assigned.*
- *MON= Monterey County*
- *SLO=San Luis Obispo County*
- *RIV=Riverside County*

Threats

Occurrences of *Arctostaphylos cruzensis* on private lands may be threatened by housing and resort development. Cattle grazing occurs at four occurrences on private land (Hearst Ranch). The effects of livestock use on *Arctostaphylos cruzensis* has not been studied, but given the persistence of

Arctostaphylos cruzensis over time on the Hearst Ranch it does not appear that grazing is a threat at this time.

The plant(s) located on National Forest System land are threatened by susceptibility to any additional physical damage resulting from wildfire or the use of machines and hand tools to fight fire. The plant is located in a remote area and is not otherwise susceptible to dispersed recreation or trampling from trail or road use and maintenance. However, there is a high risk of extirpation from National Forest System land due to the small size of the 'population' and its susceptibility to stochastic events.

Conservation and Management Considerations

- Protect all *Arctostaphylos cruzensis* found on Los Padres National Forest.
- Maintain shrubs grown from cuttings as a possible source of additional plants for re-introduction onto suitable habitat or to replace the damage clone at Pacific Valley. Maintain occurrences outplanted by Mike Foster and Dieter Wilken.

Evaluation of Current Situation and Threats on National Forest System Lands

Arctostaphylos cruzensis is very uncommon on National Forest System (NFS) land. The current population found near Pacific Valley is very small. There is a risk that the remaining plants could be accidentally damaged as a result of fire suppression activities.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
E	E	E	E	E	E	E

Arctostaphylos cruzensis is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

On NFS land, *Arctostaphylos cruzensis* is inherently rare and not naturally well distributed and this

limited distribution and abundance may result in the loss of populations (occurrences) from stochastic events such that the potential for extirpation from NFS lands is high. Potential for extirpation is unrelated to ongoing uses and activities on NFS land and the risk of extirpation does not vary by alternative. Because of the small population size of *Arctostaphylos cruzensis* on National Forest System (NFS) land and its susceptibility to stochastic events, including physical damage resulting from wildfire or the use of machines and hand tools to suppress fire, the outcome statement for all alternatives is E.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	B	B

If the Arroyo de la Cruz area continues to be managed primarily for livestock then habitat conditions there for *Arctostaphylos cruzensis* are likely to remain unthreatened. Habitat affected by the construction and reconstruction of Highway 1 is not likely to be recovered. Variations in potential impacts to the one population on NFS lands by alternative do not affect the overall outlook for this species on all lands where it occurs.

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Arabis shockleyi

Arctostaphylos edmundsii

Arctostaphylos edmundsii

Arctostaphylos edmundsii J.T. Howell (Little Sur manzanita)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2 S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Arctostaphylos edmundsii is endemic to Monterey County from Garrapata Creek south to Pfeiffer Point (Wells 1993, California Natural Diversity Database 2004). There are nine known occurrences (California Natural Diversity Database 2004).

Distribution in the Planning Area

Arctostaphylos edmundsii occurs at two locations on the Monterey Ranger District of the Los Padres National Forest: Pfeiffer Beach and Pfeiffer Point (California Natural Diversity Database 2004). The colony at Pfeiffer Point covers portions of about 20 acres on cliffs and slopes. The colony at Pfeiffer Beach consists of patches of *Arctostaphylos edmundsii* at the mouth of Sycamore Creek. There is also a small colony six feet across on a lower cliff slope about 4 miles north of Pfeiffer Point (Forest Service files).

Taxonomy and Natural History

Arctostaphylos edmundsii is a dicot in the heath family (Ericaceae). It is one of a group of low-mounded, small-leaved manzanitas, most of which have a coastal distribution. It is distinguished from the other species of manzanita by leaf, flower, and fruit characters (Wells 1993). The hanging garden manzanita (*Arctostaphylos edmundsii* var. *parvifolia*) (Occurrence #1, in part) is considered Rare by the State of California but recent taxonomic treatments refer to these plants as *Arctostaphylos edmundsii* forma *parvifolia*, thus recognizing their presence in the ornamental horticulture trade without erecting the taxon to full varietal status.

Arctostaphylos edmundsii is an evergreen shrub that blooms November-April (California Native Plant Society 2001). *Arctostaphylos edmundsii* does not have a basal burl, is semi-prostrate, grows to a height of 4 to 20 inches (1-5 dm) and can be 8 to 11.5 feet (2.5-3.5 m) broad. The basal trunk diameter grows up to 4 inches (1 dm) wide and there can be rooting along the stem. The branchlets are pilose with spreading hairs. The leaves are elliptic to round, shiny with a yellow-green hue. The newer leaves have bright red midribs and margins. Flowers are found in a compact cluster. Prominent bracts and soft hairs characterize the rachis. The petals are pink and fused into an urn shape. There are ten stamens.

Habitat Description

Arctostaphylos edmundsii occurs on terraces with sandy soils that are exposed to high winds, sea spray, and fog. Vegetation is coastal bluff scrub and maritime chaparral.

At Pfeiffer Point, *Arctostaphylos edmundsii* is often a dominant plant, often in pure stands, or with *Salvia mellifera*, *Adenostoma fasciculatum*, and *Arctostaphylos rosei*.

Occurrence Status

At Occurrence #1 (Type Locality) *Arctostaphylos edmundsii* is described as "forming mounds" (California Natural Diversity Database 2004) and consists of the Type locality for both *Arctostaphylos edmundsii* var. *edmundsii* and *Arctostaphylos edmundsii* var. *parvifolia* (the two types are separated by 0.1 miles). The type for *Arctostaphylos edmundsii* var. *edmundsii* is located 1.2 miles south of the Little Sur River and consisted of about 12 plants. The type for *Arctostaphylos edmundsii* var. *parvifolia* is 1.1 miles south of the Little Sur River and consists of a few depauperate shrubs (Roof 1961).

Occurrence #2 at the Point Sur Light House Reservation consists of at least three, fairly large colonies (Roof 1966). Occurrences #3-#6 are all on private land and each consists of at least one colony of *Arctostaphylos edmundsii*. Occurrence #5 (Rocky Creek Colonies) is "abundant...and widely distributed for about a quarter of a mile inland (Roof 1966). Occurrence #6 (Garrapata Creek Colonies) was described as "...a small...colony (or, perhaps one great single plant)...to a diameter of forty feet" (Roof 1966).

Population trends of the two occurrences on National Forest System lands (Occurrences #7 and #8) are unknown. Occurrence #8 (Pfeiffer Point) consists of over 1,000 plants and is thought to be the largest extant colony of *Arctostaphylos edmundsii* (Roof 1966, California Natural Diversity Database 2004). Occurrence #7 (Pfeiffer Beach) is much smaller (California Natural Diversity Database 2004).

Occurrence #10 is located at Andrew Molera State Park and consists of an "89' by 120' mat" (California Natural Diversity Database 2004).

Threats

The two occurrences of *Arctostaphylos edmundsii* on National Forest System lands have moderate vulnerability (Stephenson and Calcarone 1999) due to the potential to be affected by foot traffic. In 1977, observations recorded in Forest Service files (Griffin) reports that "the colony along the ridge on the north slope of Pfeiffer Point is moderately disturbed by trails, but most of the population is well protected by nature its habitat; i.e., cliffs and steep rocky slopes."

A third occurrence of *Arctostaphylos edmundsii* is found on DOD land administered by the Coast Guard. The plants here are mostly free of disturbance as are the plants found in Andrew Molera State Park. However, ice plant and erosion are potential threats for both occurrences (California Natural Diversity Database 2004).

There are no threats listed for the occurrences found on private land (California Natural Diversity Database 2004).

Conservation and Management Considerations

Monitor occurrences of *Arctostaphylos edmundsii* to determine if measures are needed to redirect or control foot traffic.

Evaluation of Current Situation and Threats on National Forest System Lands

Arctostaphylos edmundsii is a very narrow endemic restricted to a small amount of habitat along the Big Sur coast. However, the places where it grows are not subject to measurable impacts other than a trail that passes through one occurrence. By maintaining the current distribution of *Arctostaphylos edmundsii* on National Forest System lands, no alternative would contribute to adverse cumulative effects.

Based upon the above analysis this species has been assigned the following risk category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Arctostaphylos edmundsii is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Arctostaphylos edmundsii* would remain distributed across its current geographic range on National Forest System lands

under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Arctostaphylos edmundsii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Arctostaphylos hooveri

Arctostaphylos hooveri Swall (Hoover's manzanita)

Management Status

Federal: None

California: None

Heritage Rank: G3 S3.3? – No current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Arctostaphylos hooveri occurs in the Santa Lucia Mountains in Monterey and San Luis Obispo Counties (Wells 1993, California Native Plant Society 2001).

Distribution in the Planning Area

Arctostaphylos hooveri occurs on the Los Padres National Forest on Chalk Peak and on Cone Peak in the Ventana Wilderness (Stephenson and Calcarone 1999, CalFlora 2002). It also occurs near the boundary with Fort Hunter Liggett in the area near the South Coast Ridge Road, around 2-3 miles south-southeast of Chalk Peak, and around 3 miles northeast of Chalk Peak (Painter 2004). CalFlora (2002) has records for collections from about another ten locations that are likely to be on the Los Padres National Forest. The type of *Arctostaphylos hooveri* was collected along the road leading south from Nacimiento Pass by Hoover & Wells in 1960 (Painter 2004).

Taxonomy and Natural History

Arctostaphylos hooveri is a dicot in the heath family (Ericaceae).

Arctostaphylos hooveri is an evergreen shrub that blooms February–June (California Native Plant Society 2001). *Arctostaphylos hooveri* lacks a burl (Wells 1993); hence, it does not crown-sprout.

Habitat Description

Arctostaphylos hooveri occurs in broad-leaved upland forest, rocky chaparral areas, cismontane woodland, and lower montane coniferous forest at elevations of 1,600–3,300 feet (480-1,010 meters) (California Native Plant Society 2001). It is locally abundant on shallow soils underlain by gneiss bedrock (Wells 1961) and decomposing sandstone (Painter 2004). It seems to be a pioneer or successional shrub, occurring chiefly along roadsides and in other openings in forests dominated by broad-sclerophylls (madrone, tan-oak, California bay, and oaks) and locally by ponderosa pine or Coulter pine, but not in the dense stands of nearby chamise chaparral (Wells 1961).

Occurrence Status

Arctostaphylos hooveri is found in sufficient numbers and distributed widely enough that the potential for extinction is considered to be low (California Native Plant Society 2001).

Threats

There are no identified substantial risks to *Arctostaphylos hooveri* on National Forest System lands. Several populations near the South Coast Ridge Road were depleted by a 1996 wildfire. Road maintenance, livestock grazing, feral pigs, and dispersed recreation may have the potential to occasionally impact individual shrubs, but it is not likely that these land uses are having any effect on the local distribution or abundance of *Arctostaphylos hooveri*. The frequent or early application of prescribed fire could affect this species, but this scenario is not likely to occur on National Forest System land, at least not on a landscape level that could affect the ability of *Arctostaphylos hooveri* to reproduce and maintain itself over time. The assumption that there is a low likelihood that prescribed fire would be applied too frequently in occupied habitat is based on the location of most occurrences; i. e., they are in designated Wilderness or in areas that are not considered urban-wildland interface, and these areas are not a high priority for fuels treatment at this time.

After the Wild Cattle Fire (1996), Neese and Painter observed that parts of the putative type locality for *Arctostaphylos hooveri* had been bulldozed and used for parking vehicles during the fire. Several *A. hooveri* plants were killed or damaged. *Genista monspessulana* and other weedy nonnative plant taxa were becoming established (Painter 2004).

During work at Fort Hunter Liggett, Neese and Painter also observed that *A. hooveri* plants near the Coast Ridge Road were not infrequently severely damaged or killed by road maintenance work (Painter 2004).

Conservation and Management Considerations

Monitoring of occurrences affected by the 1996 wildfire near the South Coast Ridge Road should occur to determine mid and long-term responses of *Arctostaphylos hooveri* to fire.

Evaluation of Current Situation and Threats on National Forest System Lands

Arctostaphylos hooveri is endemic to the southern Santa Lucia Mountains but within this somewhat narrow range it is often locally abundant. No site-specific threats have been identified on National Forest System lands. Under all alternatives, land use in areas of occupied habitat is not likely to change over time and therefore the local distribution of *Arctostaphylos hooveri* is also likely to remain unchanged.

Based upon the above analysis this species has been assigned the following threat category:

3. Common or widespread in plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Arctostaphylos hooveri* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Arctostaphylos hooveri* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Arctostaphylos edmundsii

Arctostaphylos luciana

Arctostaphylos luciana

Arctostaphylos luciana Wells (Santa Lucia manzanita)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Arctostaphylos luciana is endemic to San Luis Obispo County, occurring in the southern Santa Lucia Range from the Adelaide and Klau mining district to several locations on the ridges southeast of Cuesta Pass; i.e., the Black Butte, Lopez Mountain and Gay Mountain areas. Up to eight occurrences have been reported (Stephenson and Calcarone 1999), seven of which are listed in the California Natural Diversity Database (2004). *Arctostaphylos luciana* has also been collected from the area between Morro Bay and Atascadero (Highway 41) though there is some indication that these plants are hybrids with *Arctostaphylos obispoensis* (SMASCH 2002).

Distribution in the Planning Area

Five occurrences of *Arctostaphylos luciana* (California Natural Diversity Database Occurrences #1, #2, #3, #4, and #6) are located on the Los Padres National Forest in the area southeast of Cuesta Pass (Stephenson and Calcarone 1999, California Natural Diversity Database 2004). There are estimated to be 3,179 acres (1,287 hectares) of occupied habitat on the Los Padres National Forest (Stephenson and Calcarone 1999). *Arctostaphylos luciana* is locally abundant in this area, often forming pure stands.

Taxonomy and Natural History

Arctostaphylos luciana is a dicot in the heath family (Ericaceae). It is placed in the *Foliobracteata* section, a group that contains several other range-restricted species. It is distinguished from closely related species by the absence of a basal burl, strongly overlapping and clasping leaves that are whitish with lobed bases, smooth bark, strongly recurved pedicels in fruit, and glabrous fruit (Wells 1993.)

Young branches are covered with soft, short hairs. This species can hybridize with Bishop manzanita (*A. obispoensis*), and a hybrid population may be present on the west side of Cuesta Pass.

Arctostaphylos luciana is a tall evergreen shrub, often with a tree-like structure, that can reach more than 16 feet (5 meters) in height. It flowers December–March (Matthews 1997 California Native Plant Society 2001). This species lacks a basal burl, regenerating by seed (obligate seeder), which requires that periodic fire is necessary to regenerate stands.

Habitat Description

Arctostaphylos luciana grows on shale substrates (mostly Monterey shale) and outcrops on slopes in chaparral and cismontane woodland at elevations of 1,150–2,800 feet (350-850 meters) (Stephenson and Calcarone 1999, California Natural Diversity Database 2004) forming open stands of chaparral that alternative with stands of *Quercus agrifolia* and *Lithocarpus densiflorus*. *Pinus attenuata* or *Pinus coulteri* are also frequently associated with *Arctostaphylos luciana*.

Occurrence Status

The population trends of *Arctostaphylos luciana* on National Forest System lands are unknown (Stephenson and Calcarone 1999). Forest Service records from 1980 indicate that there were hundreds of young, healthy shrubs scattered along the road from Cuesta Pass to Mount Lowe and also scattered in turnouts and clearings in surrounding chaparral, indicating good population vigor.

Occurrence data – *Arctostaphylos luciana* (Santa Lucia manzanita)

Occurrence	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1974	RIDGES WEST OF BEND IN LOPEZ CANYON, ABOUT 3 MILES SOUTHEAST OF CUESTA SUMMIT. THIS OCCURRENCE INCLUDES COLLECTIONS FROM "RIDGES WEST OF BEND IN LOPEZ CANYON", "3 MI SE OF CUESTA SUMMIT", "HEAD OF LOPEZ CANYON", AND "MTNS EAST OF SAN LUIS OBISPO...ELEVATION 2500-2800 FEET", T30S/R13E/S16	SLO
2	U	1936	1.25 MILES WEST OF GAY MOUNTAIN, EAST OF SAN LUIS OBISPO, T30S/R13E/S28	SLO

3	U	1963	0.5 MILE EAST OF CUESTA PASS, NORTHEAST OF SAN LUIS OBISPO. MAPPED JUST EAST OF CUESTA PASS ALONG DIRT ROAD WHICH FOLLOWS THE MAIN RIDGE OF THE SANTA LUCIA RANGE, T30S/R13E/S06	SLO
4	U	1966	2 MILES EAST OF CUESTA PASS, OFF OF HIGHWAY 101, NORTHEAST OF SAN LUIS OBISPO. MAPPED ABOUT 2 MILES SSE OF CUESTA PASS ALONG RIDGE ROAD TO MT. LOWE, T30S/R13E/S08	SLO
5	U	1936	1.75 MILES NNE OF SLIDE HILL, EAST OF SAN LUIS OBISPO. MAPPED ABOUT 1 MILE WNW OF BALD MOUNTAIN, T31S/R14E/S07	SLO
6	U	1966	CUESTA PASS SUMMIT ALONG HIGHWAY 101, NORTHEAST OF SAN LUIS OBISPO. OCCURRENCE INCLUDES COLLECTIONS FROM "A FEW YARDS WEST OF HWY 101 ON CUESTA PASS SUMMIT", "WEST SIDE OF HWY EXACTLY AT (CUESTA) SUMMIT", "SUMMITS ABOVE (SE OF) CUESTA PASS", AND "CUESTA SUMMIT NORTH OF HWY 101", T30S/R12E	SLO
7	U	1969	KLAU DISTRICT MINES, SANTA LUCIA RANGE, WEST OF PASO ROBLES. MAPPED ABOUT 3 MILES ENE OF CYPRESS MOUNTAIN, T26S/R10E/S33	SLO

- *U = Unknown*
- ** = An occurrence number has not been assigned*
- *SLO = San Luis Obispo*

Threats

Arctostaphylos luciana has low vulnerability on National Forest System lands (Stephenson and

Calcarone 1999). Current fire frequencies appear to be meeting the regeneration requirements of the species. The area occupied by the Cuesta Pass metapopulation burned in 1922, in 1961, and again during the Hwy 41 Fire of 1994. At some locations on private land, plants are at risk from road maintenance and construction activities.

Conservation and Management Considerations

Monitor occurrences of *Arctostaphylos luciana* to gather more information regarding the species response to the Hwy 41 Fire in 1994.

Evaluation of Current Situation and Threats on National Forest System Lands

Arctostaphylos luciana is endemic to San Luis Obispo County and occurs in a limited number of occurrences, but five of the seven known occurrences are on National Forest System land and these occurrences are very large covering, covering over 3,000 acres of land. These occurrences are not known to be threatened by activities on National Forest Systems land and there are indications that recruitment is occurring in areas previously disturbed by vehicle use or vegetation clearance. Under all alternatives there would be no expected change in land use for the areas occupied by *Arctostaphylos luciana*. This is because the plants are located in designated Wilderness or in the Back Country Motorized land use zone and this does not vary by alternative.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Arctostaphylos luciana is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Arctostaphylos luciana* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Arctostaphylos luciana* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Arctostaphylos hooveri

Arctostaphylos obispoensis

Arctostaphylos obispoensis

Arctostaphylos obispoensis Eastwood (Bishop manzanita)

Management Status

Federal: None

California: None

Heritage Rank: G3 S3? – No current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Arctostaphylos obispoensis occurs in the southern Santa Lucia Mountains in Monterey and San Luis Obispo Counties (California Native Plant Society 2001, Wells 1993).

Distribution in the Planning Area

Arctostaphylos obispoensis occurs on the Los Padres National Forest (CalFlora 2002) in numerous locations along the ridges and upper slopes that form the crest of the Santa Lucia Mountains, as well as the boundary between Los Padres National Forest and Fort Hunter Liggett. Several occurrences are in the Cuesta Ridge Botanical Area and along the ridge road to Cerro Alto. This taxon is present in the south half of the Monterey Ranger District in the Alder Creek watershed and along South Coast Ridge Road, just to the east of the Monterey Ranger District on Fort Hunter Liggett in the Los Burros Creek watershed, including Los Burros Creek and Burro Mountain, and southeast of the Monterey Ranger District on Burnett Peak (CalFlora 2002). The Los Padres National Forest also has a non-vouchered record of *Arctostaphylos obispoensis* from San Martin Top, west of Alder Creek Camp (Safford pers. comm.). Additional occurrences have been noted on Camp San Luis Obispo, which abuts Los Padres National Forest (Painter 2004).

Taxonomy and Natural History

Arctostaphylos obispoensis is a dicot in the heath family (Ericaceae).

Arctostaphylos obispoensis is an evergreen shrub that blooms February–June (California Native Plant Society 2001). This taxon does not form a burl (Painter 2004).

Habitat Description

Arctostaphylos obispoensis occurs on rocky, soils in closed-cone coniferous forest, chaparral, and cismontane woodland (California Native Plant Society 2001). The substrate is often but not always serpentinite (Hoover 1970).

Occurrence Status

Arctostaphylos obispoensis is found in sufficient numbers and wide enough distribution that the potential for extinction is considered to be low (California Native Plant Society 2001). Hoover (1970) describes the plant's status as "common, often locally abundant."

Threats

There are no identified substantial threats to this species on National Forest System lands. However, it has been noted that individual plants along Coast Ridge Road are severely damaged or killed by periodic road maintenance (Painter 2004).

Threats and possible threats at Camp San Luis Obispo, which abuts the Los Padres National Forest, include cattle, feral pigs, feral goats, nonnative plants, mine and tailings reclamation projects, use of non-local plant materials in revegetation projects, military training activities, road maintenance, too frequent fires, out of season fires, trampling, soil compaction, and dust (Painter 2004).

Conservation and Management Considerations

Consider recording information on occurrences of *Arctostaphylos obispoensis*.

Evaluation of Current Situation and Threats on National Forest System Lands

Based upon the above analysis this species has been assigned the following risk category:

3. Common or widespread in plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation, and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Arctostaphylos*

obispoensis would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Arctostaphylos obispoensis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Personal Communication

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Arctostaphylos luciana

Arctostaphylos otayensis

Arctostaphylos otayensis

Arctostaphylos otayensis Wiesel & B. Schreiber (Otay manzanita)

Management Status

Federal: None

California: None

Heritage Rank: G2, S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Arctostaphylos otayensis, Otay manzanita, is endemic to San Diego County in the southwest Peninsular Ranges (Wells 1993). Most occurrences are reported from the San Ysidro and Jamul Mountains; however, isolated occurrences have been reported from the Cuyamaca Mountains and Hot Springs Mountain (California Natural Diversity Database 2004). Surveys for *A. otayensis* on Hot Springs Mountain were unsuccessful in 1979 (USDA Forest Service 1979). Occurrence no.10 in the California Natural Diversity Database (CNDDDB), reported to be on Cuyamaca Mountain just south of the town of Julian, is also presumed to be erroneous (California Natural Diversity Database 2004, Reiser 1994).

Distribution in the Planning Area

There are no known or confirmed occurrences of *Arctostaphylos otayensis* from National Forest System lands. The CNDDDB lists an historic record from a 1944 herbarium collection for Guatay Mountain on the Cleveland National Forest (CNF) (California Natural Diversity Database 2004). According to Philip Wells and Craig Reiser, this collection was misidentified and is not *A. otayensis* (Cleveland National Forest records). Although north of its range, suitable habitat for *A. otayensis* does occur on the Cleveland National Forest (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Arctostaphylos otayensis is shrub in the heath family (Ericaceae). It is distinguished from other manzanitas in the area by lack of a basal burl and the presence of a combination of long floral bracts and

gland-tipped hairs (Beauchamp 1986, Wells 1993). The leaves are simple, elliptic to oblong with rounded to truncate leaf bases. Plants are evergreen and flower from January through March. Due to the lack of a burl, fire will kill *A. otayensis* plants (Abrams 1951).

Habitat Description

Arctostaphylos otayensis occurs in chaparral and cismontane woodlands and peaks on metavolcanic or gabbroic soils at elevations of 900 to 5,600 feet (275–1,700 meters) (California Native Plant Society 1991, Wells 1993). Conditions are xeric, with soils mapped as San Miguel-Exchequer rocky silt loam (Reiser 1994). Common associated species are *Arctostaphylos glandulosa* and *Ceanothus tomentosus* ssp. *oliveaceus*.

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 17 occurrences for *A. otayensis* (California Natural Diversity Database 2004). Two of the occurrences, numbers 7 and 10, on Guatay and Cuyamaca Mountains are most likely misidentifications. Also, four of these occurrences are old, unconfirmed records. The remaining occurrences are on private land centered in southern San Diego County in the San Ysidro, San Miguel and Jamul Mountains. Over 3000 individuals were observed in 1991 on San Miguel Mountain (California Natural Diversity Database 2004). Population numbers are unknown for other occurrences.

Threats

Most of the known occurrences of this species are relatively protected on lands managed by the Bureau of Land Management and US Fish and Wildlife Service. Otay Valley has recently experienced a rapid rate of development that is continuing. Some of the *A. otayensis* occurrences on private lands have been surveyed for future development, with some populations planned for open space around the Otay Ranch Development. Current status of the populations on private and federal lands is presumed to be stable. The most significant threat to these populations is short fire return intervals. A severe fire will usually kill all the plants in a population, requiring regeneration from seeds in the opening created by the fire. Surrounding urban development may increase the potential for wildfire through known populations. *Arctostaphylos otayensis* is not a burl forming species, lacking the ability to crown sprout after fires, and thus is an obligate seeder. Plants need sufficient time between consecutive fires to mature and produce viable seeds for regeneration. Non-sprouting shrubs in southern California can be eliminated in short fire return interval regimes (Keeley and Zedler 1978, Zedler and others 1983).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Arctostaphylos otayensis*:

- Conduct surveys in potential habitat on gabbro soils within the National Forest System lands for

new occurrences.

Evaluation of Current Situation and Threats on National Forest System Lands

Arctostaphylos otayensis is not known to occur on National Forest System lands; however, gabbro habitat does occur on the Cleveland National Forest. If additional surveys detect this species on gabbro or metavolcanic outcrops, protection of the occurrences from too-frequent fire will best help conserve the species.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

Arctostaphylos otayensis is limited in its distribution with occurrences restricted to the southern mountains of San Diego County. Narrow environmental requirements only allow continued species existence in isolated patches. *Arctostaphylos otayensis* is not known to occur on National Forest System lands, although potential habitat exists on gabbro outcrops. It is, therefore, not possible to describe the effects of the alternatives on this species without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Arctostaphylos otayensis*.

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Arctostaphylos obispoensis

Arctostaphylos peninsularis
ssp. peninsularis

Arctostaphylos peninsularis ssp. peninsularis

Arctostaphylos peninsularis P.V. Wells ssp. *peninsularis* (Peninsular manzanita)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3G4, S3S2 (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 2-2-1

General Distribution

Arctostaphylos peninsularis ssp. *peninsularis*, Peninsular manzanita, is only known from the Peninsular Ranges of Baja California, Mexico (Lardner pers. comm.). However, potential habitat was thought to be present in the Laguna and Cuyamaca Mountains (Wells 2000).

Distribution in the Planning Area

There are no occurrences of *Arctostaphylos peninsularis* ssp. *peninsularis* on National Forest System lands. Plants once thought to be *Arctostaphylos peninsularis* ssp. *peninsularis* on the Cleveland National Forest have been reclassified as *A. rainbowensis* (Keeley and Massihi 1994). Up until 2005, Forest botanists thought there may be potential habitat for *Arctostaphylos peninsularis* ssp. *peninsularis* on the Cleveland National Forest in the Laguna and Cuyamaca Mountains (Wells 2000), however reviews of this taxon for the Forest Plan Revision FEIS have disclosed additional information. Review of this taxon indicates that "Wells does not consider it to be present in California" (Jepson Interchange 2005).

Review of this taxon prior to 2005 revealed that there are no occurrences of *Arctostaphylos peninsularis* ssp. *peninsularis* on the San Bernardino National Forest, nor was there potential habitat present (Lardner pers. comm.). This determination was made using current literature and discussions with local botanists to clarify statements regarding possible occurrences of *Arctostaphylos peninsularis* ssp. *peninsularis* in the Santa Rosa Mountains on land adjacent to National Forest System lands, on land proposed for acquisition by the San Bernardino National Forest, and the presence of potential habitat within San Bernardino National Forest boundaries in Stephenson and Calcarone (1999). Plants from Santa Rosa

Mountains may be more closely aligned with *A. parryana* (California Native Plant Society 2001). Keeley and others (1997) recently described *A. parryi* ssp. *deserticum* from the Santa Rosa Mountains. This subspecies does occur on the Forest but is not rare (Lardner pers. comm.). *Arctostaphylos parryana* ssp. *tumescens* (Heartbar or interior manzanita) was described by Keeley and others (1997) in the San Bernardino Mountains. This subspecies, with California Native Plant Society List 4 status, also occurs on the San Bernardino National Forest but is not a Forest sensitive plant (Lardner pers. comm.).

Taxonomy and Natural History

Arctostaphylos peninsularis ssp. *peninsularis* is a burl-forming member of the Heath family (Ericaceae) (Wells 2000), indicating that it can resprout following fire. It is an evergreen shrub that flowers from April to May (California Native Plant Society 2001). Keeley (1974) initially reported *A. peninsularis* ssp. *peninsularis* from southern California. He later designated most of the southern California populations as a new species, *Arctostaphylos rainbowensis* (Rainbow manzanita) (Keeley and Massihi 1994). *A. peninsularis* ssp. *peninsularis* and *A. rainbowensis* can be distinguished by their ranges and by the shape and color of the fruit, presence of stem hairs, and inflorescence characters (Keeley and Massihi 1994, Wells 2000).

Wells (1993) did not recognize the California occurrences of *A. peninsularis* ssp. *peninsularis* as valid and did not include this taxon in the *Jepson Manual* (Hickman 1993). Keeley and Massihi (1994) have suggested that some of the occurrences intergrade with *A. glandulosa* ssp. *adamsii* (Adams manzanita); Wells (2000) suggests that the California occurrences are *A. glandulosa* ssp. *adamsii*. In addition, Keeley and others (1997) recently described *A. parryi* ssp. *deserticum*, a new taxon that is similar to *A. peninsularis* ssp. *peninsularis* and that also occurs in chaparral on the desert edges. Wells (2000) did not accept this new taxon, indicating that he believes it to be the same as *A. glandulosa* ssp. *adamsii*. No decisions have been made concerning this taxon for Flora of North America or the revision of The Jepson Manual according to V.T. Parker (Painter 2004). More information on this taxon can be obtained from Jon Keeley (USGS BRD), Michael Vasey (San Francisco State University), and V. Thomas Parker (San Francisco State University).

Habitat Description

Arctostaphylos peninsularis ssp. *peninsularis* habitat is described as chaparral on desert edges at middle to upper mountain elevations of southern California and northern Baja California, Mexico, generally between 3,280 and 8,200 feet (1,000–2,500 meters). This species has been observed below Jeffrey pine forest, on granite outcroppings (Wells 2000).

Occurrence Status

Arctostaphylos peninsularis ssp. *peninsularis* may be distributed in a few highly restricted occurrences but is not currently considered to be at risk of extinction; it is more common in other parts of its range (California Native Plant Society 2001). Population trends for this species are unknown (California

Natural Diversity Database 2004, Stephenson and Calcarone 1999).

Threats

As of the 2005 Forest Plan Revision viability analysis, this taxon is not known to occur in California. No threats are described.

Conservation and Management Considerations

Conservation of this species will depend on efforts outside of the southern California national forest's actions.

Evaluation of Current Situation and Threats on National Forest System Lands

This taxon does not occur in California. It is a San Bernardino National Forest Sensitive species that is being recommended for removal from the Forest Sensitive list in 2005 (Eliason pers. comm.). This taxon was a threat category 2 species in the Draft Environmental Impact Statement. Upon review in 2005, this species has been reassigned to the following threat category in the Final Environmental Impact Statement:

1. Not in Plan Area

Viability Outcomes

Arctostaphylos peninsularis ssp. *peninsularis* is a USDA, Region 5 Forest Service, Sensitive Species.

Until this taxon is removed from the Sensitive List, this assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

No populations of *Arctostaphylos peninsularis* ssp. *peninsularis* are known to occur in California. No analysis is presented for *Arctostaphylos peninsularis* ssp. *peninsularis*.

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Arctostaphylos otayensis

Arctostaphylos pilosula

Arctostaphylos pilosula

Arctostaphylos pilosula Jepson & Wiesel. (Santa Margarita manzanita)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Arctostaphylos pilosula is endemic to San Luis Obispo County (California Native Plant Society 2001, Wells 1993) and is distributed in widely scattered locations from the ridges and slopes of the southern Santa Lucia Mountains and the La Panza Range to the low hills located between San Luis Obispo and Arroyo Grande (California Natural Diversity Database 2004, CalFlora 2002). It ranges from Pine Mountain/Ocean View Mine in northern San Luis Obispo County to Indian Knob, just south of San Luis Obispo. It has also been reported from the Cypress Mountain area east of Paso Robles (CalFlora 2002) though this location needs to be verified (Painter 2004).

Distribution in the Planning Area

Arctostaphylos pilosula is found on the Los Padres National Forest at two locations, both in the La Panza Range: one on Pozo Summit (Occurrence #3) and another on the jeep trail from Pozo Summit to Pine Mountain (Occurrence #2). A third occurrence east of Pozo is also likely to be on National Forest System lands and several occurrences near Lopez Lake are within a few miles of National Forest System lands (California Natural Diversity Database 2004). A collection by Clare Hardham from Pozo - Hi Mountain (CalFlora 2003) may also be located on the Los Padres National Forest. Based on specimens at the Santa Barbara Botanic Garden, Painter (2004) states that the report from Fort Hunter Liggett is based on a misidentification.

Taxonomy and Natural History

Arctostaphylos pilosula is a dicot in the heath family (Ericaceae). It can be distinguished from other manzanitas in its range by leaf, inflorescence, and floral characters (Wells 1993). The bark of *Arctostaphylos pilosula* is dark, red-brown and smooth; the twigs are pubescent and may have long or short bristly hairs. *Arctostaphylos pilosula* leaves are elliptic to ovate, 1.5-4.5 cm long, and gray-green to yellow-green, and the flowers, white to pink, are urn shaped and in racemes.

Arctostaphylos pilosula is an evergreen shrub that blooms December–March (California Native Plant Society 2001). It does not form burls but reproduces from seed; therefore, periodic fire is necessary for regenerating stands.

Habitat Description

Arctostaphylos pilosula is associated with chamise chaparral and manzanita chaparral habitats and sometime with closed cone conifers (California Natural Diversity Database 2004). *Arctostaphylos pilosula* occurs on various sedimentary substrates, including shale and sandstone, but it has also been reported from weathered granite and serpentinite (Matthews 1993, California Natural Diversity Database 2004).

Occurrence Status

There is very little information regarding the status of *Arctostaphylos pilosula*. Hoover (1970) reported that *Arctostaphylos pilosula* is "most plentiful on sandstone hills between San Luis Valley and the coast."

California Natural Diversity Database (CNDDDB) Occurrence #1 consisted of less than 100 plants in 1983 (California Natural Diversity Database 2004). There is no data on the abundance of Occurrence #2, which is found on National Forest System land.

About 200 shrubs were estimated to be present at CNDDDB Occurrence #3 in 1984 (California Natural Diversity Database 2004). In 2002, monitoring of CNDDDB Occurrence #3 within the 1996 Highway 58 fire area found that the wildfire killed all but about 20 of the existing mature shrubs (Foster 2002). However, many seedlings were present. In June of 2003, monitoring of Occurrence #3 found that about 140 seedlings had become established and combine with the 20 or so surviving shrubs to produce a population that consists of least 160 plants (Foster 2003). More young shrubs may be present on the site but hidden from ready view by the density of the regenerating chaparral – especially *Adenostoma fasciculatum*.

There is no other data regarding the abundance of plants at the other ten locations where *Arctostaphylos pilosula* is reported to occur (California Natural Diversity Database 2004).

Occurrence data – *Arctostaphylos pilosula* (Santa Margarita Manzanita)

Occurrence	No. of Plants	Year Reported	Location/Land Owner	County
1	< 100 in 1983	1983	ALONG UPPER LOPEZ CANYON ROAD, 1.9 MILES FROM THE JUNCTION WITH HI MOUNTAIN ROAD, IN LOPEZ COUNTY PARK, T31S/R14E	SLO
2	U	1984	ALONG JEEP TRAIL FROM POZO SUMMIT TO PINE MTN. POPULATION CONTINUES TO THE EAST SOUTH SOUTHEAST FROM THE MAPPED BOUNDARY ACCORDING TO GASKIN, T30S/R16E	SLO
3	200 in 1984	1984	ABOUT 0.25 AIRMI DUE S OF POZO SUMMIT, ALONG JEEP TRAIL, T30S/R16E	SLO
5	U	1937	3 MI E OF POZO, T30s/R15E/S13	SLO
6	U	1967	4.5 MI NNE OF POZO, LA PANZA RANGE, T30S/R15E/S34	SLO
7	U	1939	BETWEEN FORKS OF SALINAS RIVER AND SALSIPUEDES RIVER (CREEK). MAPPED BETWEEN THE TWO FORKS AS ESTIMATED POSITION WOULD HAVE BEEN PRE-DAM, T30S/R14E/S14	SLO
8	U	1938	PALOMA CREEK ROAD, SOUTH OF ATASCADERO, T29S/R12E	SLO
9	U	1960	NORTH SIDE OF CYPRESS MOUNTAIN, T27S/R09E/S01	SLO
10	U	1961	4 MI W OF OCEAN VIEW MINE, BETWEEN PINE MOUNTAIN AND BURNETT PEAK. (MAPPED 4 MI NW ON DIRT ROAD), T25S/R08E/S29	SLO

11	U	1986	N OF CONFLUENCE OF PHOENIX CR & ARROYO GRANDE CR, E OF UPPER LOPEZ CYN RD, T31S/R14E/ PVT	SLO
12	U	1986	HUFFS HOLE CR, W OF CONFLUENCE W/ DRY CR, UPPER LOPEZ CYN RD, T31S/R14E/ S23	SLO
13	1 in 1990	1990	NORTH OF TORO CREEK ABOUT 1.2 MI NNE OF GAGING STATION NEAR CONFLUENCE WITH SALINAS RIVER, EAST OF SANTA MARGARITA LAKE. ABOVE STEEP ROCKY HILLSIDE AND DRY FARMED AREA. SITE IS 0.25-0.5 MILE NORTHWEST OF RIVER ROAD, NORTH OF POZO ROAD. MAPPED WITHIN THE NW 1/4 SW 1/4 SECTION 6.	SLO
14	U	1980	VICINITY OF INDIAN KNOB, ABOUT 3.5 MILES NNW OF PISMO BEACH, SOUTH OF SAN LUIS OBISPO. ALONG ROADS TO THE NORTH AND SE OF INDIAN KNOB. EXACT LOCATION AND EXTENT OF POPULATION NOT CLEARLY INDICATED IN THE LITERATURE. SITE MAPPED AT CNDDDB NEAR SUMMIT RIDGE OF INDIAN KNOB, T31S/R12E	SLO

- *U = Unknown*
- ** = An occurrence number has not been assigned*
- *SLO = San Luis Obispo*

Threats

General threats to *Arctostaphylos pilosula* include road construction and maintenance, housing development, and off-highway vehicle (OHV) traffic (California Natural Diversity Database 2004). Known threats are primarily to occurrences on private lands, and vulnerability on National Forest System lands appears to be low (Stephenson and Calcarone 1999). Plants at the Pozo Summit site are affected by an off-highway vehicle trail that bisects the occurrence; plants are affected by dust, but monitoring in 2003 found no trail widening or route proliferation from OHV use. This use removed a small amount of potential habitat but considerable amounts of undisturbed habitat remain.

Conservation and Management Considerations

More information is needed for occurrences on National Forest System lands, particularly for the locations in American Canyon and Pozo – Hi Mt.

Evaluation of Current Situation and Threats on National Forest System Lands

Arctostaphylos pilosula is endemic to San Luis Obispo County and two of the known locations are on the Los Padres National Forest. Available information indicates that occurrences are stable and not currently threatened by loss of habitat. Some indirect effects may occur to plants from off-highway vehicle use, but recent monitoring indicates that this impact is small in magnitude and limited in extent. No other land uses are occurring at known locations on National Forest System lands.

Based upon the above analysis, *Arctostaphylos pilosula* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Arctostaphylos pilosula is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Arctostaphylos pilosula* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Arctostaphylos pilosula* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Arctostaphylos peninsularis
ssp. peninsularis

Arctostaphylos rainbowensis

Arctostaphylos rainbowensis

Arctostaphylos rainbowensis Keeley & Massihi (Rainbow manzanita)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Arctostaphylos rainbowensis, Rainbow manzanita, occurs in northwestern San Diego and southern Riverside counties between 980 and 2,000 feet (300-600 meters) (Keeley and Massihi 1994). It occurs in relative abundance on the southwest slopes of Mount Olympus south of the town of Temecula. Other smaller populations are scattered on the Santa Margarita Mountains and the Santa Rosa Plateau. *Arctostaphylos rainbowensis* is the only *Arctostaphylos* within its range. At the eastern and western edge of its range, *A. rainbowensis* is sympatric and possibly hybridizing with *A. glandulosa* (Keeley and Massihi 1994).

Distribution in the Planning Area

Within the National Forest System lands, *Arctostaphylos rainbowensis* is only known from two occurrences in the Cleveland National Forest (CNF). These occurrences are located in the San Mateo Wilderness at Fisherman's Camp near the confluence of San Mateo and Tenaja Canyons, and in the Agua Tibia Wilderness on a ridge between Pechanga and Kolb Creeks.

Taxonomy and Natural History

Arctostaphylos rainbowensis is a burl-forming shrub, 3 – 13 feet tall. Burls may be large and platform-like on resprouted shrubs. The bark is red-brown with microscopically glandular-puberulent brachlets. Leaves have two times the number of stomata on the abaxial as on the adaxial side. Petioles are 6-12 mm; leaf blades are 35-50 mm long and 20-35 mm wide, elliptic to ovate in shape with rounded bases and with occasionally serrate margins (especially on recent resprouts). Leaves are glabrous and are

moderately to slightly glaucous. Panicles descend with non-overlapping, 2-4 mm, deltoid-subulate shaped bracts and exposed buds, with 4-5 branches. Panicles are compact in flower and widely spread in fruit. Rachis appears glabrous but with sparse short glandular hairs. The corolla is white, urceolate, and pubescent inside, 6-8 mm long, with a densely hairy inflated filament base. Sepals are weakly appressed to the fruit. Mature fruits are globose, 8-12 mm, dark brown with a distinct purple tinge and often with whitish bloom (Keeley and Massihi 1994). Plants flower from December to March.

Arctostaphylos rainbowensis historically was treated as a disjunct population of *A. peninsularis* or a hybrid between *A. glandulosa* and *A. glauca*. It is distinguished from *A. peninsularis* by its range of distribution; it differs from *A. glandulosa* by its non-scabrous leaves, reduced floral bracts, and larger, round fruits; and it is distinct from *A. glauca* by having a burl, non-reflexed floral bracts, and smaller, non-viscid fruits (Keeley and Massihi 1994).

Arctostaphylos rainbowensis produces numerous fruits and vigorously resprouts after fire. It easily establishes from seed following disturbance from fire and/or bulldozer activity (Keeley and Massihi 1994).

Habitat Description

Arctostaphylos rainbowensi occurs in sites with exposed bedrock and large boulders of igneous rock, commonly associated with gabbro soils (Keeley and Massihi 1994). It is found in chamise and southern mixed chaparral and is associated with *Adenostoma fasciculatum*, *Xylococcus bicolor*, *Ceanothus crassifolius*, *Tetracoccus diocus*, *Dicentra chrysantha*, *Salvia clevelandii*, *Malosma laurina*, *Rhus ovata*, and *Heteromeles arbutifolia*.

Occurrence Status

The California Natural Diversity Database (CNDDDB) lists 26 occurrences, with all but 2 occurrences located on private lands and presumed extant (California Department of Fish and Game 2004). Four of these private land occurrences (15% of known occurrences) are old or unconfirmed records, but are presumed extant (California Department of Fish and Game 2004; CNDDDB occurrence 16, 17, 22, 23). The largest concentration of occurrences on private land is near Mount Olympus, with several thousand plants recorded in 1990 (California Department of Fish and Game 2004). Other occurrences near the Santa Rosa Plateau are smaller in size with less than 20 plants per site. The remaining two occurrences are located on the Cleveland National Forest in the Palomar and Trabuco Ranger Districts. The Agua Tibia Wilderness occurrence was burned over during the August 2000 Pechanga wildfire.

OCCURRENCE DATA - *Arctostaphylos rainbowensis* (Rainbow manzanita)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County

24	*	U	1995	San Mateo Wilderness / CNF	RIV
25	2-1	2	1995	Agua Tibia Wilderness / CNF	RIV

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *CNF= Cleveland National Forest*
- *RIV = Riverside County*

Threats

Continuing development and conversion of lands to avocado orchards threaten *A. rainbowensis* occurrences on private land (Reiser 1994, California Native Plant Society 2001). Boring insects that feed heavily on the flowers and fruits in the eastern part of its range may also constitute a threat (Keeley and Massihi 1994). Occurrences on the Cleveland National Forest are in remote Wilderness sites, receiving few to no visitors. Consequences to *A. rainbowensis* from wildfire suppression within the Wilderness are unknown. Rainbow manzanita is a burl-forming shrub, resprouting from the burl after fire. In addition, seeds will readily establish in open space after disturbance, such as fire or bulldozer (Keeley and Massihi 1994). Southern California chaparral vegetation plants have adapted to both short and long fire interval regimes (Keeley and Zedler 1978).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Arctostaphylos rainbowensis*:

- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Monitor post fire recovery at the Agua Tibia occurrence.
- Allow wildland fires to freely burn on through populations. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks and roads, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. The use of hand line for fuel break construction is preferred.

Evaluation of Current Situation and Threats on National Forest Systems Lands

Arctostaphylos rainbowensis is considered to have low vulnerability on National Forest System lands due to the remote access of the Wilderness locations (Stephenson and Calcarone 1999). These occurrences are unlikely to be affected by Forest Service activities.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon and peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Arctostaphylos rainbowensis is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Arctostaphylos rainbowensis is considered to have low vulnerability on National Forest System lands due to the remote access to the Wilderness locations. These occurrences are unlikely to be affected by Forest Service activities. The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Arctostaphylos rainbowensis*. Variations in land use designations would not alter this current situation, and the various emphases of the alternatives would not result in a substantial change in conditions for *Arctostaphylos rainbowensis*. This species would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

Development and agriculture land conversion threatens *Arctostaphylos rainbowensis* occurrences throughout its range (California Native Plant Society 2001). This species is inherently rare due to its limited distribution and specialized habitat requirements. In addition, *Arctostaphylos rainbowensis* appears to be declining throughout its range from the lack of protection on private lands. By maintaining the current distribution of *Arctostaphylos rainbowensis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Arctostaphylos rainbowensis* to suffer a decline in its overall distribution.

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Arctostaphylos pilosula

Arctostaphylos refugioensis

Arctostaphylos refugioensis

Arctostaphylos refugioensis Gankin (Refugio manzanita)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2, S2? – Threatened? (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Arctostaphylos refugioensis is endemic to the Santa Ynez Mountains of Santa Barbara County (Wells 1993, California Native Plant Society 2001). Occurrences range from above Canada del Cojo near Lompoc to San Pedro Canyon near San Marcos Pass. About thirteen occurrences are known (Foster 1998, California Natural Diversity Database 2004).

Distribution in the Planning Area

There are twelve occurrences of *Arctostaphylos refugioensis* within the boundaries of the Los Padres National Forest. Four of these occurrences are entirely on private in-holdings, and three are partly on Forest and partly on private land. Five occurrences are entirely located on National Forest System lands.

Taxonomy and Natural History

Arctostaphylos refugioensis is a dicot in the heath family (Ericaceae). It is distinguished from other manzanitas occurring in its range by leaf and inflorescence characters (Wells 1993).

Arctostaphylos refugioensis is a tall, erect, evergreen shrub that grows to 16 feet (5 m) tall, 6.5-11.5 feet (2-3.5 m) wide, and lacks a basal burl. The youngest branches have glandular hairs. The leaves are 1.2-1.8 inches (3-4.5 cm) long, heart-shaped, sessile, sometimes clasping the stem, and strongly overlapping. The inflorescence is open with leaf-like bracts. The petals are white to pink tinged and united in an urn shape. The rachis is finely pubescent with glandular hairs. This species blooms from

December to May and produces round berries with a solid stone.

Fire appears to be needed for regeneration. California Natural Diversity Database (CNDDDB) Occurrence #1 burned in the 1920s and again in 1955. CNDDDB Occurrence #2 was affected by wildfire in 1916 and again in 1955 by the Refugio Fire. CNDDDB Occurrence #3 was burned in 1926 and again in 1955. CNDDDB Occurrences #4 and #5, and the six occurrences documented in Forest Service files were all affected by the 1955 Refugio Fire. This indicates that the species is resilient to the effects of wildfire provided fire does not occur too frequently. Time is needed for this obligate seeder to regenerate a new stand, otherwise the plant's seed bank may become depleted and insufficient in size to provide for the regeneration of the stand.

Habitat Description

Arctostaphylos refugioensis grows on south-facing slopes and ridgelines in areas of sandstone within chaparral or chaparral mixed with woodland at elevations of 900–2,400 feet (275–1,000 meters) (Foster 1998, California Native Plant Society 2001). Often found with *Adenostoma fasciculatum* and a wide variety of other native shrubs.

Occurrence Status

Arctostaphylos refugioensis populations on National Forest System lands appear to be stable (Stephenson and Calcarone 1999). The species appears to be locally abundant and robust (Foster 2001). Some stands consist of over 1,000 shrubs. Stands vary in size from scattered individual shrubs in chaparral matrix to nearly pure stands 5 acres in extent.

Occurrence data –*Arctostaphylos refugioensis* (Refugio Manzanita)

Occurrence	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1977	About 1 mile east of Refugio Pass on West Camino Cielo Road, Santa Ynez Mountains. <apped along both sides of the road, from about 0.5 to 1.25 mile east of Refugio Pass Road. Within the SW 1/4 of section 5, the NE 1/4 of section 7, and the NW 1/4 of section 8, T05N/R30W/S08	SB
381120 (RSA)		1968	Refugio Pass Road	

2 396235 (RSA)	U	1980 1955	<p>About 1 mile east of Refugio Pass on West Camino Cielo Road, Santa Ynez Mountains. Mapped along both sides of the road, from about 0.5 to 1.25 mile east of Refugio Pass Road. Within the SW 1/4 of section 5, the NE 1/4 of section 7, and the NW 1/4 of section 8, T05N/R31W/S13/PVT</p> <p>Along El Camino Cielo, about 3 miles east of summit of Refugio Pass, western Santa Ynez Mountains</p>	SB
3	U	1977	Southwest face of Bald Mountain about 0.4 mile from summit, Santa Ynez mountains. mapped largely within the NE 1/4 of the SW 1/4 of section 11/LPNF	SB
4	U	1966	1 mile downgrade (south) of Camino Cielo along Refugio Pass Road, Santa Ynez Mountains. Mapped about 1 road mile south of the pass, T05N/R30W/S07	SB
5 52174 (RSA) 534235 (RSA) 76092 (RSA)	U	1974 1974 1945 1975	<p>About 0.5 mile south of summit of Refugio Pass, Santa Ynez Mountains. Site described as 0.5 mile south of pass and 7 miles north of Highway 101. Mapped along Refugio Road near junction of road to Bald Mountain, T05N/R30W/S07</p> <p>Santa Ynez Mountains: S of summit of Refugio Pass ca. 1/2 mi; 7 mi N of jct. with Hwy 101 Elev. 2200 ft.</p> <p>S side of Refugio Pass, Santa Ynez Mountains</p> <p>Santa Ynez Mountains, 5 mi N of Hwy 101 along Refugio Pass Rd.; elev. 1700 ft.</p>	SB

6	U	1974	Above Goleta, Santa Barbara County. T05N, R28W, Section 29. Site mapped in the vicinity of San Pedro Canyon in the Santa Ynez Mountains	SB
367518 (RSA)	U	1972	Refugio Pass road about 1.1 mile above Circle Bar B Ranch, Santa Ynez Mountains (Edge/RSA)	SB
344372 (RSA)	U	1975	Santa Ynez Mountains, above Canada del Cojo northeast of Pt. Conception	SB

- *U = Unknown*
- ** = An occurrence number has not been assigned*
- *SLO = San Luis Obispo*
- *SB = Santa Barbara*

Threats

Occurrences of *Arctostaphylos refugioensis* on National Forest System lands are protected from gross land disturbances. Fuel management projects are designed to avoid occurrences of *Arctostaphylos refugioensis*. Stands of *Arctostaphylos refugioensis* have been mapped. Because of the more-or-less static nature of these locations and the shrub habit of the species, it has been relatively easy for national forest managers to avoid impacting this species when conducting vegetation management projects. To date, occupied habitat is relatively free on invasive nonnative plants. The dense stands of chaparral of which *Arctostaphylos refugioensis* is a part protects most individual plants from impacts that result from dispersed recreation and off-highway vehicle use.

Populations on private lands may be threatened by development though some of the occupied habitat on private land is designated as agricultural preserves and are currently free of the direct threats posed by housing development. In a few areas on private land, shrubs of *Arctostaphylos refugioensis* have been removed or trimmed for landscaping purposes. The magnitude of this impact has been small.

Fire suppression may be reducing opportunities for stands of *Arctostaphylos refugioensis* to regenerate though there is no evidence that the fire return interval for the vegetation in this area is outside the range of natural variability.

Conservation and Management Considerations

Continue to protect existing occurrences on National Forest System land from mechanical injury and

habitat loss. If wildfire occurs in *Arctostaphylos refugioensis* habitat, monitor habitat to determine if invasive nonnative plants are becoming established. Monitoring should also be conducted to determine if off road travel by motorized and non-motorized is impacting recovery of the vegetation. If invasive nonnative plants are detected, initiate action to eradicate or control identified infestations. If off road travel were found to be impacting the recovery of vegetation, Forest Plan standards would trigger the need to initiate corrective actions.

Evaluation of Current Situation and Threats on National Forest System Lands

Arctostaphylos refugioensis is a narrow endemic restricted to the western portion of the Santa Ynez Mountains and is found at only 13 locations. Five occurrences are entirely on National Forest System land and 3 occurrences are partly located on National Forest System lands. All of the plants found on the Los Padres National Forest have been protected through their status as sensitive plants and the recognition that the limited number of occurrences found on National Forest System lands must be conserved in order to maintain the viability of the species. Under all alternatives it is expected that habitat would continue to be maintained for all occurrences of *Arctostaphylos refugioensis* found on National Forest System lands.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Arctostaphylos refugioensis is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Arctostaphylos refugioensis* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Arctostaphylos refugioensis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Arctostaphylos rainbowensis

**Arenaria lanuginosa ssp.
saxosa**

Arenaria lanuginosa ssp. saxosa

Arenaria lanuginosa (Michaux) Rohrb. ssp. *saxosa* (A. Gray) Maguire (Rock sandwort)

Management Status

Federal: None

California: None

Heritage Rank: G5T5; S1.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 3-1-1

General Distribution

Arenaria lanuginosa ssp. *saxosa* occurs in the San Bernardino Mountains and also the Sierra San Pedro Martir in Baja California (Munz 1974). The range of *Arenaria lanuginosa* ssp. *saxosa* extends to the sky islands and mountain ranges in Utah, Colorado, Arizona, New Mexico, Texas, and Mainland Mexico (Hartman 1993). This taxon is rare in the San Bernardino Mountains and uncommon throughout its known range (Krantz, et. al. 2000).

Distribution in the Planning Area

All known occurrences of *Arenaria lanuginosa* ssp. *saxosa* in California are on the San Bernardino National Forest. Occurrence locations include Fish Creek, Lost Creek, the upper Santa Ana River Canyon, and South Fork Santa Ana River on the north slope of San Gorgonio, and Vivian Creek on the south slope (California Natural Diversity Database 2004).

Taxonomy and Natural History

Arenaria lanuginosa ssp. *saxosa* is a dicotyledon in the pink family (Caryophyllaceae). This species flowers from July-August (Munz 1974). *Arenaria lanuginosa* ssp. *saxosa* is a green perennial that is tufted or has trailing stems. The stems are 10-40 cm, rounded, and dull. The stem hairs are minute, down-curved, and in lines. The leaves are 8-22 mm, 2-6 mm wide, generally narrowly lanceolate to oblanceolate, herbaceous, obtuse to acute, and have one vein. The inflorescence consists of a terminal or axillary cyme. There may be few to many flowers. The pedicels are 3-25 mm. The sepals are 1.5-2.8

mm. In fruit, the sepals are less than 3.5 mm and acute to acuminate. The petals are 1.5-3.5 mm. The nectaries are not apparent. There are 8-12 seeds that are 0.7-0.8 mm, more or less circular, compressed, smooth, and dark brown (Hartman 1993).

Habitat Description

Arenaria lanuginosa ssp. *saxosa* inhabits moist, sandy soil, usually along streams, between 1800 and 2600 meters (Hartman 1993). Occurrences range from moist areas to dry shaded areas in montane conifer forest (Krantz, et. al. 2000). Montane conifer forest is widespread within the southern California National Forests; however, stream-sides and mesic areas are more narrowly distributed.

Occurrence Status

All occurrences in the planning area (and in California as a whole) are on the San Bernardino National Forest. The majority of these occurrences are within the San Gorgonio Wilderness, where it is protected from many Forest uses. Several of the occurrences are from historical collections and need updated fieldwork.

The following table shows the recorded occurrences in the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Arenaria lanuginosa* ssp. *saxosa* (Rock sandwort)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1906	Santa Ana Canyon, South Fork Meadows 8,200'. Needs fieldwork. (Hall/RSA) SBNF-San Gorgonio Wilderness.	SBD
2	U	1923	Vivian Creek 7200', Vivian Creek Camp. Dry, shaded, rocky bank on N-exposure. Local on slope. Needs fieldwork. (Pierson, Munz) SBNF-San Gorgonio Wilderness.	SBD

3	U	1995	Upper Santa Ana River Valley/ Canyon. S foot of Sugarloaf Mt., S Fork of the Santa Ana River. Moist sandy soil. Needs fieldwork. Information from three collections. (Munz 1922, RSA; Wheeler 1933, RSA) SBNF.	SBD
4	U	1994	South Fork of the Santa Ana River, above Poopout Hill, near Barton Flats. On trail to S Fork Meadows. Moist shaded bench. Dry rocky slope in open forest. Occasional on bench, on trail. Four collections. Needs fieldwork. SBNF- San Gorgonio Wildnerness.	SBD
5	U	1947	Lost Creek, San Gorgonio Area, San Bernardino Mountains. Mapped all along Lost Creek. Needs fieldwork. (Munz 1947/ RSA/6450') (Roos 1937/ RSA/6500') (Munz 1924/ RSA/6600'). SBNF San Gorgonio Wildnerness.	SBD
6	U	1924	Fish Creek 6750', San Gorgonio Area, San Bernardino Mountains (Pierson/RSA). Mapped all along Fish Creek (exact location U). Needs fieldwork. SBNF.	SBD
*	U	1980	South Fork Meadow, 7,800' (Thorne/RSA; Wheeler 1933, RSA). SBNF San Gorgonio Wildnerness	SBD
*	U	1922	South Fork Santa Ana R., 6300' (Pierson/RSA; Munz/RSA))	SBD

*	U	1976	South Fork Santa Ana R., 7,600-8,000' (Thorne/RSA). SBNF - San Gorgonio Wilderness	SBD
*	U	1973	Poopout Hill Trail at wilderness boundary. (Shevok/RSA)	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Threats to *Arenaria lanuginosa* ssp. *saxosa* may include impacts from various recreational activities, primarily trail use and maintenance, and off-trail walking/riding along stream courses. Trails are prevalent in the vicinity of all of the occurrences, and hiking and equestrian use are popular activities in these areas. Any hydrological impacts would also be adverse to this species, although none are identified.

Conservation and Management Considerations

The primary short-term conservation strategy for *Arenaria lanuginosa* ssp. *saxosa* is to improve the knowledge of its distribution and protect localities where threats are most pronounced. The following is a list of conservation practices that should be considered for this species:

- Survey all new occurrences of *Arenaria lanuginosa* ssp. *saxosa* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Arenaria lanuginosa* ssp. *saxosa* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Arenaria lanuginosa* ssp. *saxosa* in the planning area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.
- Where this species occurs at/near trail stream crossings with apparent off-trail impacts, install "sensitive plant habitat, stay on trail," signage.

Evaluation of Current Situation and Threats on National Forest System Lands

Arenaria lanuginosa ssp. *saxosa* is a rare, narrowly-distributed disjunct, known in California only from the San Gorgonio area of the San Bernardino Mountains. None of these occurrences are fully protected

from identified threats.

Based on the above analysis, *Arenaria lanuginosa* ssp. *saxosa* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

The primary ongoing threats to this species are trail use and management, and associated off-trail use near watercourses. Consideration of the Standards related to recreation and trails management and riparian conservation areas factor into these outcomes.

Under Alternative 1, 2, 3, 4a, and 6, this species would be at continued risk from hiking and equestrian impacts to its attractive streamside habitat at approximately current levels. Under alternatives 4 and 5, an expected increase in road and trail use and maintenance, and possibly additional needs for water diversions, increase risks above current levels. However, under Alternative 4, impacts associated with higher levels of expected recreational use could be offset by expected increases in management control and monitoring.

The effects of land use zoning on this species are similar across all alternatives. The majority of this species' distribution is and will continue to be within the San Gorgonio Wilderness. The lower portions of the distribution are zoned as Developed Area Intermix (DAI) across all alternatives. Under all alternatives, Wild and Scenic River eligibility is indicated for the Upper Santa Ana River, South Fork Santa Ana River, and Fish Creek. Under Alternatives 2, 3 and 6, an SIA would be designated at Fish Creek. Under Alternative 5, a narrow strip of existing Back Country Non-Motorized between DAI and Wilderness that is retained under Alternatives 1, 2, 3, 4, and 6 would be changed to Back Country, however, it is unlikely that any roads or motorized vehicle trails would ever be developed in the area.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	B	B

The status of this species outside of California (Southwest US and Mexico) was not researched, however, the species is not listed as rare or imperiled in any other state. The San Bernardino Mountains portion of this species range is such an extreme disjunct, there are not expected to be any effects of decline outside California on the persistence of this species here, or vice versa.

By maintaining the current distribution of *Arenaria lanuginosa* ssp. *saxosa* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Arenaria lanuginosa* ssp. *saxosa* to suffer a decline in its overall distribution.

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Arctostaphylos refugioensis

**Arenaria macradenia var.
kuschei**

Arenaria macradenia* var. *kuschei

Arenaria macradenia Wats. var. *kuschei* (Eastw.) Maguire (Forest Camp sandwort)

Management Status

Federal: Forest Service Sensitive

State: None

Heritage Rank: G5?, T2?, S1.1 (Natural Diversity Database)

California Native Plant Society (2001): List 1B, R-E-D Code 3-3-3

General Distribution

Arenaria macradenia var. *kuschei*, Forest Camp sandwort, was originally known from one occurrence based on a historic collection from "Forest Camp, Mojave Desert," a vague and undetermined locality (Stephenson and Calcarone 1999). The taxon was rediscovered in 1995 on Liebre Mountain in northern Los Angeles County (Stephenson and Calcarone 1999). Boyd (1999) reported two additional populations, similar to *A. m. kuschei*, from Soledad Canyon.

Distribution in the Planning Area

The Liebre Mountain occurrences of *Arenaria macradenia* var. *kuschei* are on the Angeles National Forest. A 1997 survey of potential habitat on Liebre Mountain and adjacent areas located six new populations.

Taxonomy and Natural History

Arenaria macradenia var. *kuschei* is a dicot in the pink family (Caryophyllaceae). It differs from other varieties of *A. macradenia* in leaf shape and the presence of glandular hairs (Hartman 1993). Boyd (1997) speculates *A. m. kuschei* may be extreme local variant of the more broadly distributed *A. m. var. arcuifolia*. *Arenaria macradenia* var. *kuschei* is a perennial herb blooming from June–July (California Native Plant Society 2001).

Habitat Description

Arenaria macradenia var. *kuschei* grows in sunny, rocky openings in a mosaic of chaparral and oak woodland at elevations of 4,000–5,600 feet (1,220–1,695 meters) (Stephenson and Calcarone 1999, California Native Plant Society 2001). All occurrences are on decomposed granite and are found in areas of gentle relief.

Occurrence Status

There are five occurrences in the California Natural Diversity Database (2004). Most of the recently discovered populations are small, both in aerial extent and in number of individual plants (Stephenson and Calcarone 1999). The largest of these populations was found at the eastern end of the mountain on the ridge dividing the Bear Canyon and Fish Canyon watersheds. Two smaller populations were found along the crest of the eastern end of Liebre Mountain: one to the east, due north of Atmore Meadow, and the other to the west near Bear Gulch Camp. The other three populations were found near the head of Tent Rock Canyon (Stephenson and Calcarone 1999).

OCCURRENCE DATA – *Arenaria macradenia* var. *kuschei* (Forest Camp sandwort)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	45 in 1997	1997	LIEBRE MOUNTAIN, NE OF W LIEBRE LOOKOUT, AND SW OF POISON OAK CANYON. 3 COLONIES MAPPED AS 3 POLYGONS IN THE S 1/2 OF SECTION 33.	LA
2	41 in 1995, 30 in 1997	1994	LIEBRE MOUNTAIN, ON SPUR ROAD SW OF ROBINSON GULCH. ONE COLONY MAPPED AS ONE POLYGON IN THE NW 1/4 OF SECTION 10.	LA
3	5 in 1997	1997	LIEBRE MOUNTAIN, NEAR BEAR GULCH CAMP. ONE COLONY MAPPED IN THE NW 1/4 OF THE SE 1/4 OF SECTION 12.	LA

4	650+ in 1997	1997	LIEBRE MOUNTAIN, ALONG THE FIREBREAK W OF ATMORE MEADOWS SPUR ROAD, S OF LIEBRE MOUNTAIN ROAD. 3 COLONIES MAPPED IN THE NE 1/4 OF THE NW 1/4 OF SECTION 18 AND THE SW1/4 OF SE1/4 SEC 7.	LA
5	20 in 1997	1997	LIEBRE MOUNTAIN, JUST W OF THE INTERSECTION OF LIEBRE MOUNTAIN ROAD AND ATMORE MEADOWS SPUR ROAD. ONE COLONY MAPPED AS ONE POLYGON IN THE NW 1/4 OF THE SW 1/4 OF SECTION 8.	LA

- *LA= Los Angeles County*

Threats

Arenaria macradenia var. *kuschei* may be threatened by land management activities, road maintenance, and vehicles (California Native Plant Society 2001). Boyd (1997) reports observed threats include direct and indirect impact from road maintenance for those populations along 7N23, off-highway vehicle damage to the populations near the head of Tentrock Canyon and on the ridge between Bear and Fish canyons, trampling by campers on the west summit of Liebre Mountain, and the ridgeline between Bear and Fish canyons is susceptible to disturbance related to fuelbreak maintenance. The two records from Solidad Canyon are at risk from private land development and mining, and the 1998 collection by Scott White (RSA6519) was in an area of a proposed quarry and may have been extirpated by now.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Arenaria macradenia* var. *kuschei*:

- Collect a herbarium voucher specimen of *Arenaria macradenia* var. *kuschei* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in the past ten years.
- Map known and new occurrences of *Arenaria macradenia* var. *kuschei* in the planning area using

NRIS data collection standards.

- In the vicinity of Liebre Mountain conduct focused surveys where planned activities could result in disturbance of *Arenaria macradenia* var. *kuschei* habitat.

Evaluation of Current Situation and Threats on National Forest System Lands

Arenaria macradenia var. *kuschei* may be threatened by land management activities including road maintenance, OHV use, and fuel break construction and maintenance.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon in the Plan Area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	B	D	B

Arenaria macradenia var. *kuschei* is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Threats to this species occur from motorized recreation use and construction and maintenance of fuel breaks. Consideration of the Standard restricting vehicle travel to designated Forest Transportation System roads and trails, along with the Standards for roads and trail management factor into these outcomes.

Under Alternatives 3, 4a, and 6 the Liebre Mountain area would become a Special Interest Area, affording considerable protection for this species. The northern flanks of Liebre Mountain are in Developed Area Interface in all alternatives, and Wildland Urban Interface activity such as fuelbreak maintenance and construction and fuels/vegetation treatments are equally likely across all alternatives, but with added consideration for habitat protection within the Special Interest Area under Alternatives 3, 4a, and 6. The western flank is zoned Back Country in all alternatives, and motorized access here would be expected to continue as it is under current conditions, but again with added consideration within the Special Interest Area for Alternatives 3, 4a, and 6. The southern flanks are Recommended Wilderness

under Alternatives 2, 3, and 6, which would afford considerable protecting for habitat on these slopes. Under Alternatives 1, 4, and 4a the south slopes would remain Back Country Mon-Motorized, and under Alternative 5 the south slope would be zoned Back Country (motorized).

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	B	D	B

All but two (and possibly one or even zero) occurrences are on National Forest System lands on the Angeles National Forest. There is no protection for *Arenaria macradenia* var. *kuschei* habitat on private land, and if these occurrences are extant, their prospects are poor. Viability of this species across its range is tied to Forest Service management at Liebre Mountain. By maintaining the current distribution of *Arenaria macradenia* var. *kuschei* on National Forest System lands, only Alternative 5 would be expected to contribute substantial adverse cumulative effects that would cause *Arenaria macradenia* var. *kuschei* to suffer a decline in its overall distribution.

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**Arenaria lanuginosa ssp.
saxosa**

Arenaria paludicola

Arenaria paludicola

Arenaria paludicola **Robinson** (Marsh sandwort)

Management Status

Federal: Endangered

California: Endangered

Heritage Rank: G1; S1.1 (California Natural Diversity Database)

California Native Plant Society: List 1B; R-E-D Code 3-3-2 (California Native Plant Society 2001).

General Distribution

Arenaria paludicola is known from scattered collections along the Pacific Coast from California and historically, from Washington (California Natural Diversity Database 2004; USDI Fish and Wildlife Service 1998). Most of the known occurrences have been extirpated, although remnant populations are present in small freshwater marshes associated with beach dunes in San Luis Obispo County, and San Bernardino County (USDI Fish and Wildlife Service 1993, 1998). *Arenaria paludicola* may be extirpated in Washington, but suitable habitat remains in wetlands near Tacoma (USDI Fish and Wildlife Service 1998). It is also known from Mexico.

Distribution in the Planning Area

No occupied or potential habitat has been identified on National Forest System lands. However, potential habitat is present in a marsh at Arrowhead Hot Springs adjacent to the San Bernardino National Forest. Arrowhead Hot Springs is approximately 9 miles (14.5 km) north of the location of historical collections from "the vicinity of San Bernardino, Santa Ana River" (USDI Fish and Wildlife Service 1998). Historically, the area of San Bernardino near the current junction of Interstates 10 and 215 was marshland, known as Urbita Hot Springs. *Arenaria paludicola* was last collected from that location in 1899 (USDI Fish and Wildlife Service 1998). The Arrowhead Hot Springs site currently supports many of the same species that were historically collected at Urbita Hot Springs (Rancho Santa Ana Botanic Gardens herbarium records).

Taxonomy and Natural History

Arenaria paludicola is a dicotyledon in the pink family (*Caryophyllaceae*). Little is known about the natural life cycle and reproductive biology of *Arenaria paludicola*. This species is a perennial herb that bears small, inconspicuous white flowers from May through August. The Black Lake Canyon population flowered and fruited minimally in 1993 and 1994, with generally one or two flowers open at a time for pollination (USDI Fish and Wildlife Service 1998).

Arenaria paludicola is a green perennial that is erect or not, often supported by surrounding vegetation. The stems are 25-90 cm, angled or grooved, shiny, and glabrous, except at the nodes. The leaves are 20-55 mm, some are 2-7 mm wide, more or less lanceolate, herbaceous, and narrowly acute with one vein. The inflorescence is characterized by solitary, axillary flowers with 20-50 mm pedicels. The sepals are 2.8-3.5 mm. In fruit, the sepals are under 4 mm and obtuse to rounded. The petals are 5-6 mm and the nectaries are not apparent. There are 15-20 seeds that are 0.8-0.9 mm, widely re-uniform to more or less compressed, smooth, and dark brown (Hartman 1993).

Habitat Description

Arenaria paludicola occurs in brackish and freshwater habitats with standing water or saturated acidic bog soils, which are predominantly sandy with a high organic content. *Arenaria paludicola* is generally associated with sedge tussocks, where it grows in peat at the base of the tussock. Cusick's sedge (*Carex cusickii*) may be a key component of marsh sandwort habitat. *Arenaria paludicola* has also been found in association with *Sparganium* sp., *Typha* sp., *Mimulus guttatus*, *Berula erecta*, and *Epilobium ciliatum*. The slender, trailing stems (up to 3.3 ft [1 m] long) are often supported by the surrounding vegetation (USDI Fish and Wildlife Service 2001).

Wetland habitats including freshwater marshes and swamps have declined significantly over the last century. Many of these habitats have undergone extensive conversion from agriculture, ranching activities, and increased urbanization. No occupied habitat for *Arenaria paludicola* is believed to occur on National Forest System lands. If the species is confirmed absent from wetlands at Arrowhead Hot Springs, this could make a suitable introduction site for species recovery.

Occurrence Status

Arenaria paludicola is restricted to a few, tenuous populations in coastal San Luis Obispo County and central Mexico. The species remains at high risk of extinction because of the very small number of individuals and populations that remain. (USDI Fish and Wildlife Service 1998)

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Arenaria paludicola* (marsh sandwort)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
8	U	1899	Vicinity of San Bernardino, Santa Ana River at 1,000'. In swamps. Exact location U. Land owner: Private. Habitat lost, presumed extirpated.	SBD

- *U = Unknown*
- *SBD = San Bernardino County*

Threats

No occurrences are known from the planning area, so no threats are identified. If the species is extant at (or introduced to) Arrowhead Hot Springs, watershed management on National Forest System lands above the private wetlands could affect the habitat.

Conservation and Management Considerations

A recovery plan has been written and implemented for *Arenaria paludicola*. The following is a prioritized list of conservation practices that should be considered for *Arenaria paludicola* should any occurrences be found on National Forest System land:

- In cooperation with the owner of Arrowhead Hot Spring, survey the wetlands for this and associated rare plants.
- If the species is absent from Arrowhead Hot Springs, and at the initiative of the Fish and Wildlife Service, assess the site for potential introduction in cooperation with the landowner and FWS.
- Collect a herbarium voucher specimen of *Arenaria paludicola* to document any new occurrences.
- Map known and new occurrences of *Arenaria paludicola* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Arenaria paludicola is a nearly-extinct species that is currently known in the United States only to occur in back-dune wetlands in coastal San Louis Obispo county. A historic record is near the San Bernardino National Forest, and suitable habitat near these localities exists adjacent to the San Bernardino National Forest.

Based on this analysis, *Arenaria paludicola* has been assigned the following threat category:

2. Potential habitat only in the plan area.

Viability Outcomes

Arenaria paludicola is listed under the Endangered Species Act of 1973, as amended, as endangered, which assures that on NFS lands, any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

No populations of *Arenaria paludicola* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupported assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Arenaria paludicola*.

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Arenaria ursina

Arenaria ursina Robinson (Bear Valley sandwort)

Management Status

Federal: Threatened

California: None

Heritage Rank: G2; S2.1 (California Natural Diversity Database 2004)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

There is no Critical Habitat designated or proposed for this species.

General Distribution

Arenaria ursina is endemic to the Big Bear Valley area in the northeastern San Bernardino Mountains (California Natural Diversity Database 2004). The California Natural Diversity Database (2004) contains records for 25 occurrences; however, the reported range (from Onyx Peak to Cactus Flat) was recently reduced after surveys identified one occurrence as desert sandwort (*Arenaria macradenia* var. *macradenia*) (Sanders pers. comm. 1998). Five other occurrences were found, two of which were not assigned an occurrence number yet.

Distribution in the Planning Area

All occurrences of *Arenaria ursina* are on or near the San Bernardino National Forest. Seventeen of the 25 CNDDDB occurrences are on the San Bernardino National Forest. Populations of *Arenaria ursina* are known from the Big Bear Lake, Holcomb Valley, Fawnskin, Arrastre Flats, Sawmill, Gold Mountain, North Baldwin Lake, Sugarloaf Ridge, South Baldwin Lake, and Broom Flat pebble plain complexes (USDA Forest Service 2002). Pebble plain habitat occurs across approximately 4,000 acres on National Forest System, private, and state lands. The San Bernardino National Forest supports approximately 3,322 acres of this habitat. Pebble plain habitat does not occur on any other forest within the Southern California forests planning area (or beyond).

Taxonomy and Natural History

Arenaria ursina is a dicotyledon in the pink family (Caryophyllaceae). It is a tufted, green perennial. Its stems are 10-18 cm, dull to more or less shiny, and often glandular-hairy. The leaves are 5-10 mm, 0.5-1 mm wide, needle-like, herbaceous, sharp-pointed, and have a single vein. The inflorescence consists of a terminal cyme with few to many, more or less open flowers. The pedicels are approximately 0.5-1.5 mm. The sepals are 1.8-3 mm; in fruit, the sepals are less than 4.2 mm, obtuse or rounded. The petals are 2-4.5 mm. The nectaries are less than 0.5 mm and rounded. There are 1-2 seeds that are 2.2-2.5 mm, more or less spheric to widely elliptic, compressed, and dark purple. The tubercles are low, rounded, and often elongate (Hartman 1993). This perennial herb that blooms May through August (California Native Plant Society 2001).

Arenaria macradenia ssp. *macradenia* in the high desert region (Lone Valley along Forest Road 3N03) appears very similar to *Arenaria ursina* because of its smaller stature (possibly due to lower rainfall amounts) and because its leaf tips are often eaten by animals, making them appear shorter (USDA Forest Service 2003). Once plants are in flower, *Arenaria ursina* can be distinguished by its smaller flowers with erect (vs. spreading) petals and obtuse (vs. acute) sepals (Hartman 1993).

Studies on the genetic diversity of *Arenaria ursina* within and between the Sawmill, Arrastre Flat and Gold Mountain pebble plain complexes found a high degree of genetic variability between six populations (Ciano 1983). Krantz (1981) observed that *Arenaria ursina* showed a vigorous response after the Heartbreak Fire, which occurred prior to 1981. He observed "many plants surviving, fruiting and seeding in good densities." Fire intensity at the *Arenaria ursina* site and the month or season the fire occurred are not known.

Habitat Description

Arenaria ursina occurs on pebble plain complexes and adjacent pinyon-juniper woodlands on xeric slopes (USDA Forest Service 2002). *Arenaria ursina* almost always grows in association with *Eriogonum kennedyi* (either var. *kennedyi* or var. *austromontanum*) and is considered to be a very strong indicator of pebble plain habitat. The species occurs at elevations of 6,720-9,475 feet (2,050-2,890 meters) and prefers mesic, rocky sites within the habitat (California Natural Diversity Database 2004; U. S. Fish and Wildlife Service 2001). *Arenaria ursina* may also grow at the edges of meadows (California Natural Diversity Database 2004).

Occurrence Status

Populations on National Forest System lands remain vulnerable and are declining, although the rate of decline has been reduced through a variety of measures to prevent impacts to individual plants and habitat. Completion of the revision to the Pebble Plain Habitat Management Guide and implementation of recommended protection measures, and an increase in public education and research are expected to continue to slow the rate of decline (USDA Forest Service 2002).

The following table shows the recorded occurrences in/near the planning area, the number of plants

reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Arenaria ursina* (Bear Valley sandwort)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1979	Onyx Peak, from summit down NNW slope ca. 1 mi. w/ <i>Eriogonum kennedyi</i> var. <i>kennedyi</i> , <i>Castilleja cinerea</i> , <i>Arabis parishii</i> , <i>Phlox dolichantha</i> , <i>Ivesia argyrocoma</i> . Includes former occ. no. 3. Threats = grazing, trampling, vehicle activity. SBNF.	SBD
2	U	1981	W side of Broom Flat near campground, ca. 2.2 mi. N of Onyx Peak. w/ <i>Eriogonum kennedyi</i> var. <i>kennedyi</i> , <i>Arabis parishii</i> , <i>Linanthus killipii</i> . SBNF.	SBD
4	U	1988	Sugarloaf, from SE edge of town S to water tank. Pebble plain w/ <i>Eriogonum kennedyi austromontanum</i> , several other rare plants. Impacted by development and ORVs; nearly extirpated due to habitat destruction. SBNF.	SBD

6	'thousands of plants'	1988	Sugarloaf, from NE edge of town to NE of Moonridge. On extremely diverse pebble plains w/ <i>Stipa lettermanii</i> , <i>Linanthus killipii</i> , <i>Eriogonum kennedyi austromontanum</i> , <i>Arabis parishii</i> , <i>Castilleja cinerea</i> , <i>Ivesia argyrocoma</i> , <i>Echinocereus engelmannii</i> , <i>Phlox dolichantha</i> , <i>Castilleja montigena</i> . Some areas fenced, but ORV trespass has occurred in the past. Includes former occ. no. 28. SBNF.	SBD
7	U	1979	Ridge SE of Wildhorse Spring, S of Bear Valley. Associated w/ <i>Phlox dolichantha</i> . SBNF.	SBD
8	U	1978	S of Big Bear Lake, ca. 0.25 mi. N of Pineknot Campground. w/ <i>Castilleja cinerea</i> , <i>Ivesia argyrocoma</i> , <i>Phlox dolichantha</i> . Pavement plain plants will be impacted from proposed development. PVT.	SBD
9	U	1979	S shore of Big Bear Lake, from Red Ant Canyon NW to Metcalf Bay. Found in pebble plain habitats and adjacent to meadows. w/ <i>Eriogonum kennedyi kennedyi</i> on the pebble plains and <i>Sidalcea pedata</i> + 9 other rare plants in the meadows. Includes former occs. 12, 15, 39. PVT/SBNF.	SBD

10	U	1978	Just W of Forest Rd., E of Metcalf Bay, Big Bear Lake. A few populations recorded from this area, incl. one between Lakeview Rd. and Hwy 18; another along Lakeview Rd. ca. 0.4 mi. N of Hwy 18. w/ <i>Eriogonum kennedyi kennedyi</i> . Incl. former occs. 11, 16. PVT.	SBD
13	100's in 1998	1979, 1998	Snow Point, E of Red Ant Canyon, at upper end of ski lift. w/ several other rare plant spp. Incl. former occ. 14. SBNF.	SBD
17	U	1981	Eagle Point, Big Bear Lake. Several other rare plants at this site. Impacted by development. PVT.	SBD
19	U	1981	Holcomb Valley area. Scattered sites: 1.2 mi. SE of Delamar Mtn.; 0.5-1.0 mi. NW of Bertha Peak summit; NW end of Lower Holcomb Valley. Sensitive pebble plain area w/ several other rare plants. Grazing has reduced/eliminated many sensitive spp.; area unprotected from ORVs. Incl. former occs. 20, 21, 22. SBNF.	SBD
23	U	1978	Along Hwy 38 along the SE edge of Fawnskin, shore of Big Bear Lake. Impacted by development. PVT. (=Moon Camp?)	SBD

24	U	1988	Upper Holcomb Valley, from Wilbur Grave SE to Van Dusen Canyon. Portion of population located on S side of FR 3N16, ca. 100-200 m E of intersection w/ 3N07. Soil has high clay content, no pebbles. Flat surrounded by <i>Pinus jeffreyi</i> , <i>Juniperus occidentalis</i> , <i>Artemisia tridentata</i> . Area formerly used for ORV events, but more recently recommended for fencing. Threatened by grazing, introduced spp., ORVs. Incl. former occs. 25, 26, 37. SBNF.	SBD
27	U	1926	Cactus Flat, 2.0 mi. N of Baldwin Lake. On dry, rocky flat. Several other rare plants historically known from this area. SBNF.	SBD
29	U	1988	North Baldwin Lake & Mojave View units of Big Bear Valley Preserve System. Pebble plain meadow mosaic w/ <i>Eriogonum kennedyi austromontanum</i> , <i>Arabis parishii</i> , <i>Astragalus leucolobus</i> , several other rare plants. Upstream development could threaten species. Mostly undisturbed/unused; some woodcutting. SBNF/PVT/CDFG.	SBD
30	U	1978	ca. 0.25 mi. NNE of Gold Hill Mine, just S of Baldwin Lake, Bear Valley. SBNF.	SBD

31	U	1988	Gold Mountain, W of Baldwin Lake, ca. 0.5 mi. N of Sewage Disposal Facility, Bear Valley. Some woodcutting, ORV use, erosion from dirt road. On clay-Saragosa quartzite pavement w/ <i>Linanthus killipii</i> , <i>Arabis parishii</i> , <i>Eriogonum kennedyi austromontanum</i> . Limited public use, mainly woodcutting. SBNF.	SBD
32	U	1978	0.4 mi. SE of Gold Mtn. elev. mark 8235' just N of Big Bear City. w/ <i>Eriogonum kennedyi kennedyi</i> . Threatened by ORVs. SBNF.	SBD
33	U	1978	Arrastre Flat-Union Flat area, just N of Big Bear City. w/ <i>Eriogonum kennedyi kennedyi</i> and possibly the largest populations of <i>Mimulus exiguus</i> and <i>Castilleja lasiorhyncha</i> . SBNF.	SBD
34	U	197U	Rebel Ridge, S of Hwy 18, W of Division Dr., Bear Valley. w/ <i>Eriogonum kennedyi kennedyi</i> and 9 sensitive plant spp. Threatened by ORVs and development in addition to trampling by people and horses. Castle Glen TNC Preserve. TNC/PVT.	SBD
35	U	1978	Mapped ca. 2 mi. E of Onyx Peak along FR 1N01. On Saragosa quartzite pavement w/ <i>Arabis parishii</i> , <i>Castilleja cinerea</i> , <i>Ivesia argyrocoma</i> , <i>Phlox dolichantha</i> . SBNF.	SBD

36	U	1979	Mapped ca. 4 mi. S of Onyx Peak. w/in the Heartbreak Fire area. w/ <i>Juniperus occidentalis</i> and a lot of <i>Arabis parishii</i> . Population vigorous w/ many seedlings. PVT.	SBD
38	U	1984	Erwin Lake. Nearly pristine alkaline wet meadow w/ high densities of <i>Thelypodium stenopetalum</i> . 11 other sensitive plant species in area. Mostly undisturbed and fenced. No hunting allowed. Grazing confined to non-sensitive areas. No formal protection. PVT.	SBD
41	U	U	Burnt Flat, ca. 3 mi. NW of Baldwin Lake. Needs fieldwork. SBNF.	SBD
42	U	1977	Johnston Grade, ca. 1 mi. E of Doble. Both sides of Hwy. Pebble plain w/ many other rare plants. SBNF.	SBD
14717 (UCR)	U	1975	San Bernardino Mts, isolated tract, Sec. 23 near Sawmill Canyon. (Thorne/RSA)	SBD
*	U	1978	San Bernardino Mts. Summit of Cushenburry grade, N. of Baldwin lake. elevation 6750 ft. (Davidson/RSA)	SBD
*	U	1979	San Bernardino National Forest. Holcomb Creek, just west of Hitchcock ranch on 3N12, elevation ca. 7150 ft. (Thorne/RSA)	SBD

24631 (UCR)	U	1979	Holcomb Valley, at W end of Holcomb Valley on 3N12, T3N/R1W/S36, elev. 7200ft.	SBD
23226 (UCR)	U	1981	1 1/2 mi. up road to Gold Mt. from route 18, T2N/R1E/S1, Elev. 7400 ft. (Ciano/UCR)	SBD

- U = Unknown
- * = an occurrence number has not been assigned
- SBNF = San Bernardino National Forest
- ANF = Angeles National Forest
- SBD = San Bernardino County
- LA = Los Angeles County
- RIV = Riverside County

Threats

Some of the original pebble plain habitat was destroyed upon the creation of Big Bear Lake. Residential and commercial development and other high-impact land uses have also contributed to habitat loss; this development continues today.

On National Forest System lands, *Arenaria ursina* populations are declining due to increased recreation use, existing roads and trails bisecting habitat, road and trail maintenance, mining, prospecting, and unauthorized uses such as off road driving by motorized and mechanized vehicles, cattle trespass, target shooting, dumping and fuel wood collection. Continued use of improvements such as developed recreation sites, and lands under special use permit completed in the past also degrades habitat. The introduction and spread of invasive nonnative species also degrades habitat (USDA Forest Service 2002). Despite these impacts, the rate of habitat decline on the Forest has decreased due to recent and ongoing habitat protection measures. Although impacts could not be entirely eliminated, barriers and signs have been installed to direct recreational use within the footprint of the sites and to educate the public as to why these measures are needed. Eight road segments affecting pebble plain habitat were decommissioned in 1999 and a full time resource officer was hired for the Big Bear area of the SBNF. This has resulted in timely fence repairs, rapid disguise of user created roads and trails as they are developed and an increase in public environmental awareness. Special use events previously located in habitat have also been relocated or the events have been modified to eliminate effects. The designation of specific locations for target shooting and closure of the Mountaintop District to dispersed shooting, and the 1998 removal of burros from the Big Bear City area has also reduced impacts to this species. The Pebble Plain Habitat Management Guide was updated in 2002, and Forest-level planning was conducted to explore methods to protect habitat over the long term in the Forest Plan Revision.

Pebble Plain habitat also faces a new threat. With the recent drought induced death of conifers on the forest, some locations of occupied habitat on NFS lands adjacent to housing communities, developed recreation sites, or sites under special use permit are in need of treatments to reduce fuel loading. Proposed fuel treatments within the Wildland Urban Interface defense and threat zones at these locations could cause direct or indirect affects to habitat. In most instances, vegetation management within pebble plain habitat can usually be avoided due to the low continuity of a large fuel bed, however removing vegetation adjacent to habitat increases the potential for unauthorized motorized access. This is a substantial concern for defense zones constructed adjacent to communities of Big Bear Lake, Big Bear City, Baldwin Lake, and Fawnskin where unauthorized motorized use is an ongoing factor in habitat degradation. With the concern for wildland fire, comes the increased potential for emergency fuelbreak construction adjacent to housing communities and within areas that are located further in to the forest to connect into the fuelbreak system. Emergency fuelbreak construction can cause a high degree of long term damage within a very short period of time.

Without knowing and including the full extent of the potential Wildland Urban Interface threats, habitat conditions on NFS lands should improve over time as long as the recommendations in the SBNF Pebble Plain Habitat Management continue to be implemented, and the long-term beneficial effects of the Pebble Plain Biological Opinion action items (habitat improvements) are realized.

Conservation and Management Considerations

The primary conservation strategy for *Arenaria ursina* is to implement the Pebble Plain Habitat Management Guide and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Implement strategies within the Pebble Plain Habitat Management Guide to the greatest extent practicable.
- Utilize the habitat suitability criteria and detection protocol developed for this taxon and apply to surveys at the project level. This will help to ensure that future projects and management actions with effects to this taxon will trigger the appropriate standards, even where occurrences are currently not known.
- Survey all new occurrences of *Arenaria ursina* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Arenaria ursina* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Arenaria ursina* in the plan area using NRIS data collection standards, and incorporate these occurrences into the GIS corporate database.

Evaluation of Current Situation and Risks on National Forest System Lands

Arenaria ursina is a locally-common narrow endemic species known only to occur in the eastern San

Bernardino Mountains, entirely on pebble plains. Some of this habitat is protected from identified threats, although most is not well protected. A large number of threats have been mitigated but will remain ongoing. The long-term effects of proposed fuel treatments are unknown.

Based on the above analysis, *Arenaria ursina* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	A	A	C	B	C	A

Arenaria ursina is listed under the Endangered Species Act of 1973, as amended, as threatened, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level. The viability of this species is entirely tied to protection and management of pebble plain habitat. Existing protections afforded this species under the Endangered Species Act provide considerable baseline protection.

Consideration of the Suitable Use restricting vehicle travel to Forest System roads and trails, along with Standards related to listed plant management, mining, and recreation management factor into the outcomes. The recommended Arrastre and Wildhorse Research Natural Areas, the Gold Mountain Critical Biological zone, the recommended Sugarloaf Wilderness, where applied, are important to the outcomes; some of these are essential for favorable viability outcomes. Presumed implementation of the Pebble Plain Habitat Management Guide is key to these outcomes under all alternatives. To provide for viability and recovery of this species, some of the most important habitat for this species must be clearly and substantially protected.

Under all alternatives 942 of the 1,563 acres of occupied habitat would continue to be protected within the North Baldwin Lake Holcomb Valley Special Interest Area (SIA). Under Alternatives 2 - 6 this taxon would receive increased protection within this SIA due to Standard S33 that ensures protection of habitat through environmental analysis when new projects are proposed. SBNF Standard S2 would also provide an increased level of protection for pebble plain habitat in alternatives 2 - 6. Under alternatives 2 - 6 a large occurrence of *Arenaria ursina* located at the non-operational Snow Forest Ski Area would receive increased protection as this special use permit is discontinued. Forty-five acres of occupied habitat are located within eligible wild and scenic river designations under Alternatives 2, 3, 4, 4a, and 6.

Under Alternative 1, pebble plain habitat in general, and *Arenaria ursina* in particular, would continue to be at risk from unauthorized vehicle travel off Forest Transportation System roads and trails. Conservation actions completed under the Southern California Conservation Strategy and its ongoing monitoring requirements would be retained. There would be no new Special Area designations. The current level of Back Country zoning would be retained.

Under Alternative 2, the Gold Mountain Critical Biological zone, the Arrastre Flat and Wildhorse Meadow recommended candidate Research Natural Areas, the recommended Sugarloaf wilderness (small area extent) and Back Country Non-Motorized zoning on the north side of Sugarloaf would provide substantial protection for this species. Occupied habitat in the Broom Flat area would receive a higher level of protection within the recommended addition to the Bighorn Wilderness.

Under Alternative 3, the Union and Gold Mountain Critical Biological zones, the Arrastre Flat and Wildhorse Meadow recommended candidate Research Natural Areas, and the recommended Sugarloaf Wilderness (large area extent) would provide substantial protection for this species. An increase in Back Country Non-Motorized zoning would occur. Occupied habitat in the Juniper Springs area would receive a higher level of protection within the recommended addition to the Bighorn Wilderness.

Under Alternative 4, the recommended Sugarloaf wilderness (full area extent) would provide protection for a large portion of the species range, however the important protections associated with Research Natural Area designations and the Gold Mountain Critical Biological zone would not occur. The current acreage of Back County zoning would remain approximately the same.

Under Alternative 4a, The Gold Mountain Critical Biological zone, the Arrastre Flat and Wildhorse Meadow Research Natural Areas, increased acres of Back Country Non-Motorized and Back Country Motorized Use Restricted zoning would provide a higher level of protection for this taxon. Occupied habitat in the Juniper Springs area would receive a higher level of protection within the recommended addition to the Bighorn Wilderness.

Under Alternative 5, no Critical Biological zones or other land use zoning would provide protection and no Special Areas would be designated. Due to the projected rise of motorized use, this alternative would be expected to increase the ongoing degradation from motorized and mechanized travel.

Under Alternative 6, increased use of Back Country Non-Motorized zoning across the range of the species including occupied habitat in the Juniper Springs area, use of Back Country Motorized Use Restricted zoning, recommendations for the Arrastre Flat and Wildhorse Meadow Research Natural Areas, the Union and Gold Mountain Critical Biological zones, and the Sugarloaf proposed wilderness (large area extent) would provide substantial protection.

Viability Outcomes for All Lands within Range of Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

The pebble plain habitat for *Arenaria ursina* on private lands in Big Bear Valley, have been highly reduced and fragmented by residential and commercial development. There are a few locations under long-term management on state lands and lands managed by The Nature Conservancy however the remaining fragments on private land will continue to be lost as continued development occurs. This loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF. By maintaining the current distribution of *Arenaria ursina* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Arenaria ursina* to suffer a decline in its overall distribution, however the population conditions on private land will likely result in the loss of populations.

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Personal Communication

Sanders, Andy. Department of Botany, University of California, Riverside- [Conversation in person after viewing specimen collected by Deveree Volgarino, Mountaintop District Botanist, San Bernardino National Forest, confirming identification of *Arenaria macradenia* var. *macradenia*.] 1998.

Arenaria paludicola

Artemisia palmeri

Artemisia palmeri

Artemisia palmeri A. Gray (San Diego sagewort)

Management Status

Federal: None

California: None

Heritage Rank: G3, S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-1

General Distribution

Artemisia palmeri, San Diego sagewort, is known from coastal San Diego County and Baja California, Mexico (Reiser 1994).

Distribution in the Planning Area

There are no documented occurrences of *Artemisia palmeri* on National Forest System lands. Occurrences have been reported near the Cleveland National Forest (CNF), Descanso Ranger District, at Skyline Truck Trail near Lyons Peak, east of Starvation Mountain, and west of Barber Mountain (Reiser 1994).

Taxonomy and Natural History

Artemisia palmeri is a strongly scented biennial or perennial from a woody base, 10-30 dm high. Stems are brittle, wand-like, and glabrous. Leaves are coarsely pinnate and glabrous to sparsely hairy, gray-green-canescens below. Pistillate flowers are zero and disk flowers 8-30. Inflorescence is less than 30 cm long. Fruits are smooth to shiny-glandular (Shultz 1993). Plants flower from July through August (Abrams 1951).

Habitat Description

Artemisia palmeri occurs along creeks and drainages near the coast and inland in sandy, mesic

conditions in chaparral, coastal scrub, riparian forest, and riparian scrub at elevations of 50-3,000 feet (15-915 meters) (Reiser 1994; Stephenson and Calcarone 1999; California Native Plant Society 2001). It has been reported in abundance in Cieneba very rocky coarse sandy loam soils near Sequan Peak on a steep, moist, northern aspect chaparral slope (Reiser 1994). At this site associated species include *Quercus berberidifolia* and *Ceanothus leucodermis*. In riparian habitats *Artemisia palmeri* occurs in shade below willow, sycamore, and cottonwood (Reiser 1994).

Occurrence Status

The California Natural Diversity Database (CNDDB) reports 35 occurrences for *Artemisia palmeri* (California Department of Fish and Game 2004). Population numbers range from 10 to over 1000 plants to dominance among the sites. There are no occurrences on National Forest System lands.

Threats

Artemisia palmeri is affected by numerous local projects that channelize or disrupt minor drainages and by massive flood control efforts (Reiser 1994). However, there are numerous locations, and the species is substantially under-documented in San Diego County (Reiser 1994).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Artemisia palmeri*:

- This species is suggested as a candidate for use in native plant introduction in riparian habitats.
- No conservation measures are recommended as this species is not rare and there are no documented occurrences on National Forest System lands

Evaluation of Current Situation and Threats on National Forest System Lands

This species has not been found on National Forest System lands and is unlikely to occur there. It is a low elevation riparian species and is not considered rare.

Based upon the above analysis this species has been assigned the following threat category:

1. Not found in the Plan area.

Viability Outcomes

No populations of *Artemisia palmeri* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly

speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Artemisia palmeri*.

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Arenaria ursina

Astragalus albens

Astragalus albens

Astragalus albens E. Greene (Cushenbury milkvetch)

Management Status

Federal: Endangered; Critical Habitat designated December 24, 2002 (67 FR 78569).

California: None

Heritage Rank: G1; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

Critical Habitat (CH) for *Astragalus albens* was designated by the USFWS on December 24, 2002 (67 Federal Register 78569) (U.S. Fish and Wildlife Service 2002). In determining which areas to designate as CH the USFWS considers those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These features are termed Primary Constituent Elements (PCEs) and they are summarized in the final rule.

General Distribution

Astragalus albens is endemic to the San Bernardino Mountains in California (California Native Plant Society 2001). This species is found primarily on the San Bernardino National Forest, but also extends northward and downslope onto private and BLM lands in Furnace, Bousic, Marble, and Cushenbury canyons, below Monarch Flat and Blackhawk Mountain, at Round Mountain, and at Terrace Springs.

Distribution in the Planning Area

Occurrence locations are distributed from the east side of Dry Canyon north to approximately 0.5 mile north of Cushenbury Springs, and southeast to 0.5 mile east of Arrastre Creek. Based on the latest survey information, there are approximately 970 acres of occupied habitat mapped for *Astragalus albens* on National Forest System lands across many scattered sites (USDA Forest Service 2000; Carbonate Habitat Management Strategy, 2003).

Taxonomy and Natural History

Astragalus albens is a dicotyledon in the pea family (Fabaceae). This perennial herb blooms between March–May (California Native Plant Society 2001). Pods ripen as early as late May, and become stiff and papery with long hairs as they mature (U.S. Fish and Wildlife Service 1997).

Astragalus albens is a delicate perennial (sometimes annual) plant with dense, appressed, flat, silvery hairs. The stems are more or less prostrate, 2-30 cm, and loosely matted. The leaves are 1-5.5 cm. There are 5-9 leaflets, which are 2-10 mm, ovate to obovate, and have blunt tips that are more or less notched. The inflorescence is characterized by 5-14 flowers that are widely spreading or reflexed. The petals are pink-purple. The banner is 7.3-9.5 mm, recurved at more or less a 40 ° angle, and the keel is approximately equal to the banner and is greater than the wings. The fruit are 10-18 mm, 2.8-3.5 mm wide, crescent-shaped, more or less three sided (with the lower sided grooved), stiffly papery, and densely strigose. There are two chambers (Spellenberg 1993).

Pollinators are probably small bees (Faegri and Van der Pijl 1978). *Astragalus albens* reproduction presumably occurs by seed, as this species is not known to reproduce vegetatively. *Astragalus albens* seeds exhibit high variability (Tierra Madre Consultants 1991). Seeds require scarification, but can remain dormant in the soil during drought years (Greene 1885). Populations appear to be greatly affected by precipitation (Barneby 1994; U.S. Fish and Wildlife Service 1994).

Habitat Description

Astragalus albens is usually found on carbonate soils at elevations of 3,600-6,200 feet (1,097-1,900 meters) (U.S. Fish and Wildlife Service 1997). It occupies sandy or stony flats, rocky hillsides, and canyon washes and fans in pinyon-juniper woodlands and blackbrush scrub communities. Differences between occupied and unoccupied habitat are described by Gonella (1994) and Neel (2000). Habitat characteristics include an open vegetation canopy cover with little accumulation of organic material, rock cover exceeding 75%, and gentle to moderate slopes (5%–30%). Parish's daisy (*Erigeron parishii*) and Cushenbury buckwheat (*Eriogonum ovalifolium* var. *vineum*) occur with *Astragalus albens* at several locations (U.S. Fish and Wildlife Service 1997). Common associated species include *Pinus monophylla*, *Juniperus* spp., *Ephedra viridis*, *Salazaria mexicana*, *Achnatherum hymenoides*, *Eriodictyon trichocalyx*, *Coleogyne ramosissima*, *Cercocarpus ledifolius*, *Yucca schidigera*, *Yucca brevifolia*, *Arctostaphylos glauca*, *Fremontodendron californicum*, *Artemisia tridentata*, *Chrysothamnus nauseosus*, and *Achnatherum coronata* (MacKay 2002).

Carbonate habitats are highly sensitive to ground disturbance and vegetation removal. Once disturbed, carbonate vegetation is slow to recover due to low plant productivity, thin, impoverished soils, and dry climate in this part of the San Bernardino Mountains. Mining activities, such as soil removal, road development, and dumping of overburden rock have led to an overall decline in the quantity and quality of carbonate habitat. Carbonate in these mountains is one of just three large high-quality deposits in the western United States. As a result, the high-grade carbonate deposits in the San Bernardino Mountains have been mined for commercial use. Limestone is used in a number of commercial applications and most carbonate habitats on National Forest System lands are under mining claims that may become

active in the future (USDA Forest Service 2003).

Occurrence Status

Astragalus albens is distributed in several restricted occurrences (California Native Plant Society 2001).

The U.S. Fish and Wildlife Service considered this species to have moderate degrees of threats and high potential for recovery at the time of listing (U.S. Fish and Wildlife Service 1994).

In 1992, there were an estimated 5,000-10,000 *Astragalus albens* plants throughout its entire range (U.S. Fish and Wildlife Service 1997; Baneby 1964). The densest population occurs in Lone Valley. Many additional occurrences within the same range have since been discovered.

Occurrences are known to expand in years of good rainfall. During a drought year in the 1980s, the total number of plants at all known locations was estimated at 2,000. Favorable rainfall in 1992, combined with a more thorough survey effort, increased the estimated number to 5,000–10,000 plants at all known sites (U.S. Fish and Wildlife Service 1997).

The following table shows the recorded occurrences in/near the area, the number of plants reported to be present, and the general location of these occurrences (refer to the Carbonate Habitat Management Strategy and associated GIS data for more thorough and precise occurrence distribution and mapping).

OCCURRENCE DATA – *Astragalus albens* (Cushenbury milkvetch)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	0 in 1988	1942, 1988	Mouth of Cushenbury Canyon, San Bernardino Mtns. Area impacted by cement dust from adjacent mine activity. Type specimen collected in 1882 is probably from this general vicinity. PVT.	SBD

2	~1000 in 1988	1988, 1992	N slope of the San Bernardino Mtns. from Whiskey Spring N to Monarch Flat, and from Silver Peak W to Mohawk Mine. Scattered populations near Whiskey Springs, Monarch Flat, Blackhawk Mtn, Silver Peak, E of Silver Peak. On limestone w/in pinyon/juniper woodland. w/ <i>Juniperus</i> , <i>Coleogyne</i> , <i>Yucca</i> , <i>Cercocarpus ledifolius</i> , <i>Arctostaphylos glauca</i> , <i>Nolina bigelovii</i> , <i>Erigeron parishii</i> , <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Damaged by adjacent limestone quarry, large slide from Blackhawk Mtn. ORVs also may threaten. Incl. former occs. 8, 11, 16, 17. PVT in SBNF.	SBD
3	0 in 1988	1924, 1988	Lower end of Cactus Flat, E end of San Bernardino Mtns. Several other rare species historically known from this site. No habitat or plants found in 1988. SBNF.	SBD
4	~200	1994	N of Silver Peak along W slope of Blackhawk Canyon. On old landslide and adjacent limestone soils. w/ <i>Coleogyne ramosissima</i> , <i>Yucca brevifolia</i> . Several roads pass through occ., but in 1988, Forest Road rerouted to avoid plants. Some plants on old disturbed roads on slides. Area adjacent to Amerigold Gold Mine site. PVT in SBNF.	SBD
5	U	U	Box S Springs. BLM/PVT.	SBD

6	150	1992	Terrace Springs vicinity. Mostly along the ridge S of Terrace Springs, w/ some populations scattered along Grapevine Creek. On undisturbed limestone areas and old roads w/in pinyon/juniper woodland. w/ <i>Coleogyne ramosissima</i> , <i>Achnatherum coronata</i> , <i>Fremontodendron californicum</i> , <i>Cercocarpus ledifolius</i> , <i>Erigeron parishii</i> , <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Plants can recolonize abandoned roads, but do not occur in quarried areas where soil profile has been eliminated. SBNF/BLM.	SBD
7	4500 on 11 acres	1992	Ridge N of Smarts Ranch Rd., S of Top Spring. Extending from ¾ mi. W of Horsethief Flat S to Smarts Ranch Rd. and continuing along ridge SE to end of ridge. Growing on soils derived from carbonate and quartz monzonite. Site dominated by open pinyon woodland. Other rare plants include <i>Erigeron parishii</i> , <i>Arabis parishii</i> , <i>Echinocereus engelmannii</i> , <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Limestone mining plan has been submitted for this site. The area is used for target practice, ORVs, and trash dumping. Undisturbed areas show much higher plant densities than disturbed areas. Incl. former occ. no. 9. SBNF.	SBD

10	< 200	1988	S of jeep road leading to Champion Joshua Tree, San Bernardino Mtns. On limestone outcrop w/ <i>Pinus monophylla</i> , <i>Juniperus californica</i> , <i>Yucca</i> spp., <i>Cercocarpus ledifolius</i> , <i>Ephedra viridis</i> , <i>Arabis shockleyi</i> , <i>Eriogonum microthecum</i> , <i>Bromus tectorum</i> , <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Scheduled for future mining. Plants mostly on undisturbed ridge. Plants are small, scattered, and less vigorous than elsewhere. SBNF.	SBD
12	3	1988	1.2 air mi. due E of Cushenbury Springs along drainage, N of Cushenbury Canyon. Just S of where road crosses drainage, N of Monarch Flat. In granitic and limestone rocky drainage: not a typical habitat. Associated w/ <i>Salazaria mexicana</i> , <i>Coleogyne ramosissima</i> , <i>Achnatherum hymenoides</i> . <i>Erigeron parishii</i> common in area. Unauthorized trash dumping and shooting activity nearby. Plants had low vigor, but habitat in good shape. BLM-Barstow RA.	SBD
13	4	1988	Arctic Canyon, San Bernardino Mtns. On steep limestone slope above drainage. w/ <i>Coleogyne ramosissima</i> , <i>Yucca schidigera</i> , <i>Pinus monophylla</i> . <i>Erigeron parishii</i> on slope W of drainage. Roads nearby. More plants probable. Habitat in good shape. No disturbances. PVT.	SBD

14	50 in 1988, dozens in 1992	1992	Bousic Canyon outwash fan, 0.25 mi. SE of Pfizer Mining Plant. w/in blackbrush scrub and along old road bed (limestone/granitic mix) which crosses wash. w/ <i>Pinus monophylla</i> , <i>Prunus fasciculatum</i> , <i>Eriodictyon trichocalyx</i> . <i>Erigeron parishii</i> common in drainage. Occasional ORV use in area. Habitat is in good condition, but occ. is on the road. PVT.	SBD
15	50 in 1988, 67 in 1996	1996	Furnace Canyon, ca. 1 air mi. SW of Pfizer Mining Plant, N slope of San Bernardino Mtns. Mapped along lower Furnace Canyon, from near the mouth upstream ca. 0.5 mi. w/ <i>Erigeron parishii</i> , but <i>Astragalus albens</i> only found in eastern polygon. In wash near granitic-limestone contact. w/ <i>Pinus monophylla</i> , <i>Yucca schidigera</i> , <i>Eriodictyon</i> sp. No plans at present to use Furnace Cr. Quarry acc. to Barrows. Overburden was dumped in the wash from quarry above. SBNF/PVT.	SBD
18	5	1988	W slope of Round Mountain, San Bernardino Mtns. In Joshua tree woodland dominated by creosote and Joshua trees. Soil is sandy and rocky w/ limestone. Feasibility study for drilling of deep cores for gold mining is imminent. Dirt roads surround mountain, and past grazing is evident. BLM-Barstow RA.	SBD

19	3	1988	On road in unnamed drainage between Marble Canyon and Arctic Canyon, S slope of San Bernardino Mtns. On graded road in drainage immediately W of Marble Canyon limestone quarry. <i>Erigeron parishii</i> , <i>Eriogonum ovalifolium vineum</i> nearby. Mining could threaten site. Poor site quality. PVT.	SBD
20	1000	1991	Near Granite Spring, 2.5 air mi. E of Baldwin Lake and 0.8 mi. ESE of Squirrel Spring. Pinyon/juniper woodland. Dominants incl. <i>Artemisia tridentata</i> , <i>Chrysothamnus nauseosus</i> . Also w/ <i>Erigeron parishii</i> , <i>Eriogonum ovalifolium vineum</i> . Site is under inactive mining claim and is crossed by an established ORV trail. SBNF.	SBD
21	50	1995	ca. 0.6 mi. N of Cushenbury Springs along the E side of Hwy 18. Just S of JCT of Hwy 18 and Camp Rock Road and 1.2 mi. from Mitsubishi Cement Plant. Site is on hill E of where Hwy crosses Cushenbury wash on a W-facing slope. Creosote-blackbrush scrub on carbonate soil w/ <i>Pleuraphis rigida</i> , <i>Pectocarya platycarpa</i> , <i>Achnatherum speciosum</i> , <i>Gutierrezia microcephala</i> , <i>Larrea tridentata</i> , <i>Ambrosia dumosa</i> , <i>Ephedra nevadensis</i> . Surrounded by development and disturbance. Threats incl. road building, ORV use, mining, development. More surveys needed to determine extent of population. Land owner: U (non-USFS).	SBD

22	100	1995	<p>ca. 1.8 mi. E of Cushenbury (Mitsubishi Cement Plant) and 1.4 mi. NNW of Silver Peak, San Bernardino Mtns. Near ridgetop on upper, W-facing slopes. In pinyon/juniper woodland on carbonate soils. w/ <i>Pinus monophylla</i>, <i>Coleogyne ramosissima</i>, <i>Ephedra viridis</i>, <i>Achnatherum coronatum</i>, <i>A. speciosum</i>. Very high species diversity at this site. <i>Oxytheca parishii goodmaniana</i>, <i>Erigeron parishii</i>, <i>Eriogonum ovalifolium</i> var. <i>vineum</i> occur nearby. More surveys needed to determine population extent. BLM-Barstow RA.</p>	SBD
23	20	1995	<p>ca. 2.5 mi. ENE of Cushenbury (Mitsubishi Cement Plant) and 1.8 mi. N of Silver Peak, San Bernardino Mtns. NW-facing slope of Peak 4867 along the upper slopes. Blackbrush scrub on gentle slope below ridge w/ carbonate soils. w/ <i>Coleogyne ramosissima</i>, <i>Yucca brevifolia</i>, <i>Ephedra nevadensis</i>, <i>Gutierrezia microcephala</i>, <i>Chaenactis stevoides</i>, <i>Camissonia boothii</i>, <i>Achnatherum</i> sp., Evidence of mining in area; new mines proposed for this vicinity. More surveys needed in area to determine population extent. BLM-Barstow RA.</p>	SBD

24	50	1995	ca. 3 mi. E of Cushenbury (Mitsubishi Cement Plant) and 1.6 mi. NNE of Silver Peak, San Bernardino Mtns. Widely scattered over several hundred feet of wash. Blackbrush scrub in wash on carbonate bedrock. w/ <i>Coleogyne ramosissima</i> , <i>Salazaria mexicana</i> , <i>Yucca schidigera</i> , <i>Encelia virginensis</i> , <i>Achnatherum speciosum</i> , <i>Poa fendleriana</i> , <i>Stephanomeria myrioclada</i> . Evidence of mining in area. New mines proposed for this vicinity. More surveys needed to determine extent of population. BLM-Barstow RA.	SBD
* 45335 (UCR)	U	1998 1986	San Bernardino Mountains: North base of Blackhawk Mountain, southwest of Round Mountain, just west of mouth of Grapevine Canyon. Near 34 ° 20' 27" N 116 ° 46' 44"W. T3N R2E midpoint of common border sec. 16 & 21. Elev. 4600 Feet. (Soza/RSA) // NE flank of Blackhawk Mountain, at base of ridge near Round Mountain, T3N/R2E/S16 (Cantrell/UCR)	SBD
27062 (UCR)	U	1981	Lower quarries of Blackhawk Mine, E of Cushenbury Cyn. (Krantz/UCR)	SBD
62544 (UCR) 85596 (UCR)	U	1990 1993	In Cushenbury Cyn., 0.1 mi. NW of Whiskey Spring, T3N/R1E/S24, elev. 5200 ft. // Whiskey Springs, ca. 2 mi. S of Mitsubishi Cement Plant, N and E side of Hwy 18 (LaRue/UCR)	SBD

68498 (UCR)	U	1991	Mitsubishi Limestone Mine, Cushenbury grade, N side of San Bernardino Mts., T3N/R1E/S14, elev. 5100 ft. (Wear/UCR)	SBD
71896 (UCR)	U	1992	S of Lucerne Valley on alluvial slope below Pfizer limestone quarry in Marble Cyn. (1 st large Cyn. W of Cushenbury Cyn. & Hwy 18) T3N/R1E/S10, elev. 4600 ft. (White/UCR)	SBD
88562 (UCR)	U	1995	N of Baldwin Lake, FS rd. 3N03 (Smart's Ranch Rd.) 2.45 mi. SE of Hwy 18, 0.8mi. W of Smart's Ranch, T3N/R2E/S33, elev. 6000 ft.	SBD
119910 (UCR)	U	1998	Desert slope above Lucerne Valley. Mitsubishi Cement property NE of Cushenbury Quarry and W of Hwy 18, T3N/R1E/S14, elev. 4800-5200	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

The primary threat to this species is loss and degradation of habitat resulting from limestone mining. At least 97% of the known occurrences are located on public land claimed for mining or on private/patented land (U.S. Fish and Wildlife Service 1997). Secondary threats include road and power line construction, utility corridors, vehicle use off classified roads, and unauthorized grazing from trespassing cattle. All of these activities are ongoing to some extent on the San Bernardino National Forest, as well as on patented claims, other private lands, and Bureau of Land Management lands (USDA Forest Service 2003; California Native Plant Society 2001).

The long-term conservation of this species is the objective of the Carbonate Habitat Management Strategy (CHMS), which was completed in 2003 and developed collaboratively by a diverse group of affected parties. Implementation of this strategy will provide for the recovery of four threatened and endangered carbonate endemic plant species while also providing for continued economically important

limestone mining. The CHMS defines a set of land management categories ranging from expected and current mining to Carbonate Habitat Reserves that will be managed for the conservation of the listed plants and habitat. Collaborating parties signed a Memorandum of Understanding (MOU), committing the SBNF to administer the strategy as future mining projects proceed and the habitat reserve is assembled (USDA Forest Service 2003).

Conservation and Management Considerations

The primary conservation strategy for *Astragalus albens* is to implement the Carbonate Habitat Management Strategy and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Implement the Carbonate Habitat Management Strategy.
- Utilize the habitat suitability criteria and detection protocol developed for this taxon and apply to surveys at the project level. This will help to ensure that future projects and management actions with effects to this taxon will trigger the appropriate standards, even where occurrences are currently not known.
- Survey all new occurrences of *Astragalus albens* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Astragalus albens* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Astragalus albens* in the plan area using NRIS data collection standards, and incorporate these occurrences into the CHMS Habitat Inventory.

Evaluation of Current Situation and Risks on National Forest System Lands

Astragalus albens is a locally-common narrow endemic species known only to occur in the north-eastern San Bernardino Mountains, and entirely on carbonate. Some of these carbonate habitat areas are protected from identified threats, although most others are not well protected.

Based on the above analysis, *Astragalus albens* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	B	C	B

Astragalus albens is listed under the federal Endangered Species Act as endangered, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

The viability of this species is tied tightly to protection and management of carbonate habitat. Existing protections afforded this species and its critical habitat under the Endangered Species Act provide considerable baseline protection. With full implementation of the Carbonate Habitat Management Strategy (CHMS) (USDA Forest Service 2003) viability for this species on NFS lands is secure.

The CHMS will provide protection and management with regard to mining activities under all alternatives, but with greater effectiveness under Alternatives 2 through 6. Under the CHMS, mining will continue to result in the majority of impacts to this species and its habitat. As an important core habitat reserve under the CHMS, the Blackhawk RNA, which supports about 235 acres of *Astragalus albens* occupied habitat is essential for a favorable viability outcome.

Under Alternatives 1, 4 and 5, protections for this species related to Land Use Zones would be limited to the existing Bighorn Mountains Wilderness. Under Alternatives 2, 3, 4a and 6, designation of the proposed Blackhawk RNA would provide essential protection, and would become a core habitat reserve under the CHMS. Under Alternatives 3 and 6, additional areas of designated Back Country Non-Motorized zoning would provide a modest increase in protection for this species. The alternatives would provide varying protection from unauthorized off-road driving, however, because of habitat terrain, this is not expected to be a substantial impact for this species.

Consideration of the Standards related to OHV, roads and recreation factor into these outcomes. The proposed Blackhawk RNA, where applied, is critical to these outcomes. Presumed implementation of the CHMS is fundamental to the outcomes.

Viability Outcome for All Land Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	B	C	B

The private lands, mainly patented claims along the base of the north slope of the San Bernardino Mountains, are a major portion of this species' distribution and have been reduced by large-scale limestone mining. The habitat surrounding these mines continues to be lost as quarries are expanded. This loss on private lands is expected to be guided in the future by the CHMS and thus not expected to reduce the viability of the protected and managed occurrences on the SBNF. Habitat on BLM lands to the north of the SBNF will also be managed under the CHMS, so that all of this species' habitat will be managed under a single strategy across jurisdictional boundaries.

By maintaining the current distribution of *Astragalus albens* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Astragalus albens* to suffer a decline in its overall distribution.

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Artemisia palmeri

Astragalus bicristatus

Astragalus bicristatus

Astragalus bicristatus A. Gray (Crested milk-vetch)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database 2003)

California Native Plant Society - List 4; R-E-D Code 1-1-3 (California Native Plant Society 2001).

General Distribution

Astragalus bicristatus is endemic to the mountains of Los Angeles, Riverside, and San Bernardino counties. Occurrences are known from the San Bernardino, Santa Rosa, and eastern San Gabriel Mountains. Most of the 28 documented occurrences of *Astragalus bicristatus* are from San Bernardino County, but several records lack specific location information (Calflora 2002; USDA Forest Service 2002). Most (perhaps all?) of these occurrences are associated with carbonate soils.

Distribution in the Planning Area

Occurrences of *Astragalus bicristatus* are known from the San Bernardino National Forest (SBNF) and (probably) the Angeles National Forest (ANF). There are historical records from San Antonio Mountain and the Prairie Fork of the San Gabriel River. Occurrences on the SBNF include Bertha Peak, Sugarloaf Ridge, White Mountain Ridge, Silver Canyon, Deep Canyon, Big Pine Flat, and the Big Bear Ranger Station in Fawnskin. An occurrence is also reported from the Santa Rosa Mountains northeast of Toro Peak.

Taxonomy and Natural History

Astragalus bicristatus is a dicotyledon in the legume family (Fabaceae). This herbaceous perennial is sparsely leafy and often minutely grayish strigose. The stem is ascending or sprawling, generally less than 5 dm long. Leaves are 3-14 cm long, with the lower stipules fused around the stem into a low sheath. There are 11-23 leaflets, often more or less well separated, 5-20 mm long, and linear to

narrowly oblong. Tips of leaflets are generally obtuse or notched and terminal not or only obscurely jointed to the midrib. There are 5-20 ascending flowers with more or less whitish petals, a banner 15-19 mm long that is recurved more or less 50 degrees, and a keel that is 12-13 mm long. Fruits are more or less pendent, with a body that is 20-43 mm long, 6-9 mm wide, and that is incurved and glabrous. Early in growth, the fruit is more or less round in cross-section and fleshy, and then becomes more or less 4-sided (prominently flanged on upper, lower) and stiffly leathery or more or less woody. The stalk-like base is downcurved, 6-10 mm long, and stout, with one chamber (Hickman 1993). Flowering occurs between May and August (Munz 1974).

Habitat Description

Astragalus bicristatus is found in sandy or rocky places within lower and upper montane conifer forests between 5,800-9,000 feet elevation (Hickman 1993), primarily if not entirely on carbonate soils. On the SBNF, plants occur on carbonate-derived gravelly or loamy to sandy soils and on rocky or pebbly slopes. Suitable habitat on the SBNF primarily occurs on the north slope of the San Bernardino Mountains in the northeastern portion of the SBNF. Habitat is threatened by mining activities, high recreation use, and development projects.

Species that may co-occur with *Astragalus bicristatus* are *Pinus jeffreyi*, *Abies concolor*, *Quercus chrysolepis*, *Amorpha californica*, *Argemone munita*, *Astragalus douglasii*, and *Erigeron foliosus*. The federally Endangered *Acanthoscyphus parishii* var. *goodmaniana* has also been found in close proximity to *Astragalus bicristatus*.

Occurrence Status

Several occurrence records for *Astragalus bicristatus* are historical and many have vague location information. Although all of these occurrences are presumed extant, the current distribution of this taxon needs to be refined. Three new occurrences located in 2001 were found in Jeffrey pine forest that had been burned in the Willow Fire in 1999.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Astragalus bicristatus* (Crested milk-vetch)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
*	U	1882	California: Holcombe [Holcomb] Valley (Calflora 2002). SBNF	SBD

*	U	1921	Swartout [Swarthout] Valley; Sawmill, 6800' (Calflora 2002). U	SBD
*	U	1917	Prairie Fork San Gabriel River, San Antonio Mountains, 5500'. (Calflora 2002). ANF	LA
*	U	1918	Ontario Peak w end; Cascade Canyon, San Antonio Mountains, 6000'(Calflora 2002). ANF	SBD
*	U	1882	California: Canon of San Bernardino Mountains [S.E. California, on the Mohave side (Calflora 2002). U	U
*	U	1918	Prairie Fork San Gabriel River, San Antonio Mountains, 7000' (Calflora 2002). ANF	LA
*	U	1899	On desert slopes San Antonio Mountains, 6500' (Calflora 2002). U-SBNF?	LA/SBD
*	U	1891-1896	Bear Valley. (Calflora 2002). U	SBD
*	U	1934	San Bernardino Mountains: E end Bear Valley, 6500' (Calflora 2002). U	SBD
*	U	1964	Unknown location in Los Angeles County (Calflora 2002). U	LA
*	U	1921	San Gabriel River, Prairie Fork, 6750' (Calflora 2002). ANF?	LA

*	U	1966	Ca. 20 mi due W of N end of Salton Sea; NE of Toro Peak, Santa Rosa Mountains (Calflora 2002). SBNF	RIV
*	U	1932	SW side Baldwin Lake San Bernardino Mts., 6750' (Calflora 2002). U	SBD
*	U	1887	Bear Valley, 6000' (Calflora 2002). U	SBD
*	U	1894	Bear Valley, San Bernardino Mountains and their eastern base, 6500'(Calflora 2002). U	SBD
*	U	1895	Bear Valley, San Bernardino Mts., 6500' (Calflora 2002). U	SBD
*	U	1926	Upper Holcomb Valley, San Bernardino Mts., 7300' (Calflora 2002). U	SBD
*	71	2001	San Bernardino Mtns: Ridge above Silver Canyon, along Forest Road 3N11 and 3N11 A, c.a. 0.2 to 0.4 km S and SE Wright Mine. SBNF	SBD
*	170	2001	San Bernardino Mtns: Ridge above Deep Canyon, along Forest Road 3N11, c.a. 0.8 km SE Wright Mine. SBNF	SBD
*	263	2001	San Bernardino Mtns: White Mountain Ridge, 0.4 km WSW White Mountain Peak mostly on west side of Forest Road 3N17. SBNF	SBD

*	13	2001	San Bernardino Mtns: Pacific Crest Trail, ¾ mile up trail from point where 4WD road crosses PCT, approx. 2.5 miles up Poligue Canyon Road from Hwy 18. Plants are immediately adjacent to south side of trail. SBNF	SBD
*	1	2000	San Bernardino Mtns: S of 1W17 OHV trail on east side of Forest Road 3N14. One plant by pine stump under small standing burned pine 30 ft. south of Willow Creek. Near Big Pine Flat. SBNF	SBD
*	15	2000	Meadow directly east of the Big Bear Ranger Station, 3 miles east of Fawnskin, off Hwy 38 (south of Hwy). Plants are located near highway on NE side of meadow (and scattered about RS Complex and Discovery Center). SBNF	SBD
*	25	2003	Sugarloaf Ridge, Sugarlump.	SBD
*	U	2004	Along Sugarloaf Ridge from unknown peak elev. 8490 ft. of Bear Mountain Ski Resort, E. to unknown peak elev. 9123 ft. USFS.	SBD
*	U	2004	Directly N. of Big Bear Discovery Center (N. of Hwy 38, W of Big Bear Ranger Station.) T2N/R1E/S17elev. 6800 ft. USDAFS.	SBD

- *U = unknown*
- *ANF = Angeles National Forest*
- *RIV = Riverside County*
- ** = an occurrence number has not been assigned*
- *LA = Los Angeles County*

- *SBNF* = *San Bernardino National Forest*
- *SBD* = *San Bernardino County*

Threats

Occurrences of *Astragalus bicristatus* are threatened by mineral extraction operations, high recreation use, ski area operation, and developments at the Big Bear Discovery Center.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Astragalus bicristatus*:

- Implement the Carbonate Habitat Management Strategy.
- Relocate historical occurrences of *Astragalus bicristatus* to determine the current distribution of the species within the Province.
- Survey all new occurrences of *Astragalus bicristatus* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Astragalus bicristatus* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Astragalus bicristatus* in the planning area using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Astragalus bicristatus is narrowly distributed and uncommon throughout southern California. Suitable habitat is distributed across the carbonate areas of the SBNF, and it is likely that the species is patchily distributed throughout this area. While some of the recorded occurrences are vulnerable to identified threats, others are remote and inaccessible to vehicle impacts. Much of the suitable habitat distributed across the carbonate areas of the forest are also not vulnerable to vehicle impacts. Mining impacts will be addressed at the project level, and will be guided by provisions of the Carbonate Habitat Management Strategy.

Based on this analysis, *Astragalus bicristatus* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Astragalus bicristatus is a USDA Region 5 Forest Service Sensitive species. This assures that any new

project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Astragalus bicristatus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Astragalus bicristatus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Astragalus brauntonii

Astragalus brauntonii Parish (Braunton's milk-vetch)

Management Status

Federal: Endangered

California: None

Heritage Rank: G2 S2.1 – very threatened (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Astragalus brauntonii is endemic to foothill habitats in the Santa Ana, San Gabriel, and Santa Monica Mountains in Ventura, Los Angeles, and Orange Counties (USDA Forest Service 2000).

Distribution in the Planning Area

Astragalus brauntonii has not been found on National Forest System lands; however, potential habitat occurs on both the Angeles and Cleveland National Forests. Occurrences on the south flank of the San Gabriel Mountains in Clamshell Canyon are adjacent to the Angeles National Forest. Potential habitat occurs near the lower Clam Shell Truck Trail, the Van Tassel Truck Trail, and the city of Monrovia, and it is highly probable that the species occurs on the Angeles National Forest (Stephenson and Calcarone 1999). Occurrences from Coal and Gypsum Canyons in the Santa Ana Mountains are adjacent to the Trabuco District of the Cleveland National Forest. Nearby potential habitat for *Astragalus brauntonii* on the Cleveland National Forest was surveyed by endangered plant specialists from Rancho Santa Ana Botanic Garden, but no additional plants were identified (USDA Forest Service 2000).

Taxonomy and Natural History

Astragalus brauntonii is a dicot in the pea family (Fabaceae). It can be distinguished from other perennial milkvetch species in the area by the woolly hairs on the stems and by the two-chambered pods (Hickman 1993).

Astragalus brauntonii is a perennial herb that blooms March-July (California Native Plant Society

2001). It is a short-lived fire follower, living only about 2–3 years following a fire (Skinner 1991). Depending on the fire interval, this species may appear only once every 20-50 years or more (USDI Fish and Wildlife Service 1997). After the Gypsum Canyon Fire in 1982, several populations (approximately 400 plants) appeared on the divide between Gypsum and Coal Canyons (Stephenson and Calcarone 1999).

Habitat Description

Astragalus brauntonii is found on small limestone outcrops in gaps or disturbed places in chaparral, coastal sage scrub, and closed-cone conifer forest (USDI Fish and Wildlife Service 1998). It occurs on recent burns or disturbed areas on stiff clay soils overlying granite or limestone (California Natural Diversity Database 2002).

Occurrence Status

Astragalus brauntonii is distributed in several highly restricted occurrences and is considered to be at risk of extinction throughout its range (California Native Plant Society 2001). Population status and trends are unknown for many occurrences, although three occurrences are declining and eight occurrences appear to be extirpated (California Natural Diversity Database 2002). Now known from fewer than 10 occurrences, with fewer than 300 total plants in 1997 (California Native Plant Society 2001).

Threats

Astragalus brauntonii is threatened by direct loss of habitat resulting from urban development, fragmentation of habitat, alterations of fire cycles, and stochastic extinction due to small population sizes and low numbers of individuals (California Native Plant Society 2001, USDA Forest Service 2000). No threats are known on National Forest System lands.

Conservation and Management Considerations

Should *Astragalus brauntonii* be found in the future on National Forest System lands, the Forest Service could potentially play a role in the recovery of the species by (1) implementing avoidance and minimization measures to protect plants and habitat from management activities, and (2) assuming ownership of private parcels supporting the species in exchange for excess National Forest System lands (USDA Forest Service 2000). A draft recovery plan for six plant species, including *Astragalus brauntonii*, was published in September 1998 (USDI Fish and Wildlife Service 1998). This species is also included in a conservation strategy for coastal sage scrub (USDA Forest Service, USDI Fish and Wildlife Service, and California Department of Fish and Game 1997).

Evaluation of Current Situation and Threats on National Forest System Lands

Astragalus brauntonii is endemic to a three county area of southern California and may occur on National Forest System lands; however, there are no known occurrences on the national forests of southern California.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

Astragalus brauntonii is listed under the Endangered Species Act of 1973, as amended, as endangered, which assures that any new project proposed on NFS lands, in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

No populations of *Astragalus brauntonii* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Astragalus brauntonii*.

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Astragalus bicristatus

Astragalus deanei

Astragalus deanei

Astragalus deanei (Rydb.) Barneby (Dean's milk-vetch)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Astragalus deanei, Dean's milk vetch, is known only from the southwestern Peninsular Ranges of San Diego County (Spellenberg 1993).

Distribution in the Planning Area

Astragalus deanei is only known from the Cleveland National Forest (CNF) in four localities, occurring near the San Diego River, Hauser Creek, and the Barrett Honor Camp.

Taxonomy and Natural History

Astragalus deanei is a perennial herbaceous locoweed with coarse hairs. Stems are 30-60 cm long with leaves 9-18 cm long, having 19-29, 4-21 mm leaflets. Leaflets are lanceolate to oblong, with a prominently raised midrib on the lower surface, especially in the basal half. Tips of leaves are obtuse. Plants flowers from March through May with 15-25 white to cream corollas, spreading, not crowded, with the pedicel becoming thick in fruit. Fruits are ascending, 15-30 mm long and 10-20 mm wide, inflated, drying papery (Spellenberg 1993). Fruits pods are also deciduous (California Native Plant Society 1979).

Following the 1970 Laguna Fire, *Astragalus deanei* was observed in abundance in the first few postfire years, indicating possible positive fire effects for this species. The occurrence in the San Diego River area likely burned in the 2003 Cedar fire, which could lead to increased population size at this location

in the next few years.

Habitat Description

Astragalus deanei occurs in open chaparral, coastal sage scrub, riparian sandy washes, and on exposed slopes in coast live oak understories. It is found on undisturbed slopes in the shade of low-growing shrubs and also in roadcuts and grazed areas, usually occurring between 243 and 2,178 feet (75-670 meters).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 16 occurrences for *A. deanei* (California Department of Fish and Game 2002). Four of the occurrences are located on the Cleveland National Forest. Seven of the CNDDDB occurrences are old unconfirmed records from the literature and one occurrence is reported as extirpated. The remaining four occurrences are on private lands and are presumed to be extant with an unknown number individual per occurrences.

OCCURRENCE DATA of *Astragalus deanei* (Dean's milk-vetch) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
16	2-1	25	1993	San Diego River / CNF	SD
15	2-2	17	1991	Barrett Honor Camp, Pine Creek Wilderness / CNF	SD
13	2-3	1	1990	Hauser Creek / CNF	SD
14	2-4	200	1992	Barrett Honor Camp, Pine Creek Wilderness / CNF	SD

- *SD* = San Diego County
- *CNF* = Cleveland National Forest

Threats

This species is considered by Reiser (1994) to have the potential for extinction within the next two

decades. Populations of *A. deanei* on private lands are threatened by development. Much of the historical habitat probably utilized by this species has been developed for sand mining and golf courses.

Three of the four Cleveland National Forest occurrences are located near roads and immigrant trails (CNF 2-2, 2-3, 2-4). These sites can potentially be threatened by road maintenance, unauthorized trail creation, use or rehabilitation. However, *Astragalus* species are commonly found in disturbed environments. Occurrences in Pine Creek Wilderness are affected by a very low level of recreational use however user created migrant trails do occur within potential habitat. The San Diego River occurrence is slightly remote and also receives a low level of effects from recreational use. All these sites could be affected by wildfire suppression activities; those within designated and recommended wilderness would be affected to a much lesser extent.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Astragalus deanei*:

- Survey potential habitat at low elevations (800 – 1,100 feet) within National Forest System lands for new occurrences.
- Survey known locations within the 2003 Cedar Fire areas.
- Monitor differences between disturbed and undisturbed populations for future management.
- Monitor the San Diego River population for postfire population response.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on federal lands.
- Do not protect populations from moderate disturbance such as wildfire. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. The use of hand line for fuel break construction is preferred.
- Protect all plant locations from extreme disturbance such as bulldozing.

Evaluation of Current Situation and Threats on National Forest Systems Lands

Astragalus deanei is considered to have low to moderate vulnerability on National Forest System lands, however Reiser (1994) states that this species is susceptible to extinction within the next 2 decades across its range. On NFS lands, there is little to no risk of extirpation of these occurrences due to three of the four Cleveland National Forest occurrences receiving a low level of effects within existing and proposed wilderness. Potential threats to these occurrences include trampling and the erosion from trail use. On the other hand, the existence of trails creates openings in which the species can grow. Occurrences are not clustered in one area, decreasing the likelihood of one catastrophic event destroying all populations of this plant on the Cleveland National Forest. The trend for this species appears to be stable on the Cleveland National Forest. Since we know this taxon increased in numbers for the first few years after the 1970 Laguna fire, there is potential for an increase in population size and number in locations burned in the 2003 Cedar Fire. Population numbers should be monitored to ensure

continued sustainability of these occurrences.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Astragalus deanei is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Astragalus deanei is considered to have low to moderate vulnerability on National Forest System lands, however it has been said that it is susceptible to extinction due to the low number of occurrences throughout its range (Reiser 1994). The trend for this species appears to be stable on the Cleveland National Forest and there appears to be little to no risk of extirpation of these occurrences. On NFS lands, three of the four Cleveland National Forest occurrences are protected within existing and proposed Wilderness boundaries that receive few visitors due to the remoteness of the sites. Threats to these occurrences include trampling and the erosion from trail use. However, since the occurrences are not clustered in one area, there is a low likelihood of one catastrophic event destroying all occurrences on NFS lands. Population numbers should be monitored to ensure continued sustainability of these occurrences on the forest.

Although *Astragalus deanei* is uncommon within its geographic range, there are some impacts that could occur to undetected occurrences from earth disturbing activities associated with fire suppression and trail maintenance. The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the final environmental impact statement. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Astragalus deanei*. Variations in land use designations would not alter this current situation and the various emphases of the alternatives would not result in a substantial change in conditions for *Astragalus deanei*. This species would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Lands within Range of Taxon

Astragalus deanei has moderate to high vulnerability of extinction throughout its range. This species occurs at low elevations chaparral and coastal sage scrub habitats of western San Diego County. These habitat types are in continuing decline, especially in coastal, urban areas. Development, recreation use, dumping, and off-road vehicle use threaten *Astragalus deanei* populations at lower elevations. Eight occurrences, or 50% of documented occurrences, are unconfirmed or extirpated and the four extant occurrences off National Forest System lands are threatened by future development on private lands.

By maintaining the current distribution of *Astragalus deanei* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Astragalus deanei* to suffer a decline in its overall distribution.

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Astragalus brauntonii

**Astragalus douglasii var.
perstrictus**

Astragalus douglasii var. perstrictus

Astragalus douglasii Torrey & A. Gray var. *perstrictus* (Rydb.) Munz

(Jacumba milk-vetch, Campo milk-vetch)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T2, S1.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Astragalus douglasii var. *perstrictus*, Jacumba milkvetch or Campo milkvetch, is known from the eastern Peninsular Ranges of San Diego and Imperial counties and northern Baja California (Spellenberg 1993).

Distribution in the Planning Area

Astragalus douglasii var. *perstrictus* is only known from the Cleveland National Forest (CNF), Descanso Ranger District.

Taxonomy and Natural History

Astragalus douglasii var. *perstrictus* is an herbaceous perennial locoweed. Rootstock is a long- carrot-like taproot (Kopp pers. comm.). Variety *perstrictus* is distinguished from other varieties of *A. douglasii* by its erect peduncles and erect, stiff stems of 4-10 dm. Leaves have 13-19 leaflets, with greenish margins and raised midribs. Calyx tubes are most densely hairy between the lobes, 0.7-2.2 mm, triangular, and as wide as long. The inflorescence has 10-30 white to yellow flowers from May to June. Fruit pods are bladderly with thin, papery walls (Spellenberg 1993). Fruits are commonly destroyed by insect herbivory (Kopp, pers. comm.).

Habitat Description

Astragalus douglasii var. *perstrictus* occurs on stony hillsides and gravelly or sandy flats in open chamise chaparral, oak woodlands, valley grasslands, pinyon-juniper woodland, and in grazed willow scrub on decomposed granite soils at elevations between 900-1370 meters (2900-4500 feet) (California Native Plant Society 2001, USDA Forest Service 1998). Plants seem to favor areas with mild soil disturbance; scattered individuals have been seen on road shoulders where there is little competition from other species (Stephenson and Calcarone 1999). Plants may also be soil type specific (USDA Forest Service 1998).

Occurrence Status

The California Natural Diversity Database (CNDDDB) lists 37 occurrences (California Natural Diversity Database 2004). Two of these occurrences are on privately owned lands. Although last seen in 1978, these populations are presumed extant. The remaining occurrences are on federal lands with the majority on Bureau of Land Management with 23 occurrences. The Bureau of Indian Affairs also has 4 occurrences. On the Cleveland National Forest there are 8 occurrences.

OCCURRENCE DATA of *Astragalus douglasii* var. *perstrictus* (Jacumba milkvetch) on National Forest lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
37	2-1	12	1990	Cameron Fire Station / CNF	SD
U	2-2	8	1990	Kitchen Creek Rd. / CNF	SD
38	2-3	12	1991	Cameron Fire Station / CNF	SD
39	2-4	6	1993	Morena Valley / CNF	SD
35	2-5	50	1995	Boulder Oaks Campground / CNF	SD
36	2-6	2	1995	Buckman Springs Rd. / CNF	SD

37	2-7	50	1991	Cameron Fire Station / CNF	SD
34	2-8	1	1995	Cottonwood Fire Station / CNF	SD
40	2-10	40	2001	Buckman Springs / CNF	SD

- U = Unknown
- CNF = Cleveland National Forest
- SD = San Diego County

Threats

The majority of the known occurrences are on BLM lands and are presumed extant. Occurrences on the Cleveland National Forest are stable and appear to thrive in disturbance environments, growing in roadbeds and soils disturbed by concentrated cattle use (Kopp, pers. comm.). Invasive nonnative plant invasion may threaten some locations. In addition, occurrences on private lands may be threatened by development. However, development in the region of this plant's range is limited.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Astragalus douglasii* var. *perstrictus*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Species Atlas.
- Maintain the geographic and genetic diversity of the subspecies by protecting all known populations on Federal lands.
- Allow wildland fires to freely burn on through populations.
- Do not protect from low impact ground disturbance, such as road maintenance and cattle grazing, in areas around plant occurrences. However, leave plants intact.
- Continue to meet with employees at Cameron Fire Station (Descanso Ranger District) as needed to inform them of occurrences at the fire station.

Evaluation of Current Situation and Threats on National Forest Systems Lands

Occurrences of *A. douglasii* var. *perstrictus* on the Cleveland National Forest are stable and of low vulnerability to local extirpation due to their ability to thrive in areas with low levels of ground disturbance. Removal of ground disturbance was observed to be detrimental to a population of this

taxon. When a parking area at the Cameron Station Native Plant Nursery was relocated to avoid plants, the plants in the old parking area died out (Kopp, pers. comm.).

Based upon the above analysis, this species has been assigned the following threat category:

4. Uncommon and peripheral in the plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Astragalus douglasii var. *perstrictus* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Although *Astragalus douglasii* var. *perstrictus* is uncommon within its geographic range, there are some impacts that could occur to undetected occurrences from ground disturbance activities; however, this species tolerates some disturbance. The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Astragalus douglasii* var. *perstrictus*. Variations in land use designations would not alter this current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Astragalus douglasii* var. *perstrictus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

The majority of *A. douglasii* var. *perstrictus* occurrences throughout its range are located on BLM lands with a few on private properties. This species is of low vulnerability to local extirpation and/or extinction due to its protection on federal lands and the limited urban development within its range. By maintaining the current distribution of *Astragalus douglasii* var. *perstrictus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Astragalus douglasii* var. *perstrictus* to suffer a decline in its overall distribution.

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Astragalus deanei

**Astragalus lentiginosus var.
antoniuis**

Astragalus lentiginosus* var. *antonius

Astragalus lentiginosus Hook. var. *antonius* Barneby (San Antonio milk-vetch)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T1; S1? (California Natural Diversity Database)

California Native Plant Society – List 1B; R-E-D Code 3-1-3 (California Native Plant Society 2001).

General Distribution

Astragalus lentiginosus var. *antonius* is a geographically narrowly-restricted species endemic to the San Gabriel and San Antonio Mountains. Five occurrences are known to occur on National Forest system lands near the Wrightwood area of the Angeles and San Bernardino National Forests.

Distribution in the Planning Area

Astragalus lentiginosus var. *antonius* is located within the boundaries of the Angeles National Forest and the San Bernardino National Forest. Surveys conducted in June 2003 by Rancho Santa Ana Botanic Garden staff located 9 extant occurrences; five are on National Forest System lands. Surveys at historic occurrences in Lone Pine Canyon and on Pinyon Ridge were negative.

Taxonomy and Natural History

Astragalus lentiginosus var. *antonius* is a dicotyledonous plant in the pea family (*Fabaceae*) and is a member of the Papilionoideae tribe. The plant is a prostrate or spreading perennial, extending 1-3 dm from its base. The leaves are 3-8 cm with 11-21 leaflets, each 3-11 mm and more or less obovate and densely strigose. There are between 10 and 15 flowers in each inflorescence, and each flower has purple petals, a banner that is 9-10.5 mm and a keel that is 7.2-8.2 mm. Fruit size ranges from 14 to 30 mm long and 10 to 18 mm wide. The fruit is straw-colored and plumply ovoid to spheric, with a bladdery, papery, sparsely strigose and somewhat shiny texture. The beak is erect and measures 3-6 mm.

Astragalus lentiginosus var. *antonius* blooms from April to July (Spellenberg 1993).

Astragalus lentiginosus is a highly variable species occurring widely throughout California, with 19 varieties recognized (Spellenberg 1993). Many of the varieties have highly restricted ranges; eight varieties are rare, range-restricted taxa of southern California that are included on California Native Plant Society's List 1B (California Native Plant Society 2001).

Habitat Description

Astragalus lentiginosus var. *antonius* is found on dry, open slopes within Jeffrey pine forest between 5,000 and 8,000 feet in elevation (Spellenberg 1993; USDA Forest Service 1995).

Occurrence Status

There are five known extant occurrences on NFS lands. Survey documentation of the Sheep Creek drainage occurrence on the SBNF was rated as "excellent" for size and productivity of population, vitality and vigor of individuals, a "good" habitat condition rating, "good" long term prospects for continued existence, "good" defensibility on a gated road, with an overall "good" ranking (USDA Forest Service 2003). Four other extant occurrences were documented on NFS lands. Four extant occurrences were found on private lands in 2003. One known extant occurrence of *Astragalus lentiginosus* var. *antonius* was observed in 2000 on private land and is presumed to be stable. Large numbers of plants were found throughout the 2003 survey locations.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Astragalus lentiginosus* var. *antonius* (San Antonio milkvetch)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1924	Swarthout Valley, San Antonio Mountains. Pvt.	LA, SBD
2	U	1947	Blue Ridge, San Gabriel Mountains. ANF	LA, SBD
3	U	Ca. 1917	Prairie Fork of the San Gabriel River, San Gabriel Mountains. ANF	LA

4	U	1927	Pinon ridge, San Gabriel Mountains. ANF.	LA
5	179	2000	South edge of Wrightwood, 0.15-0.35 mi. ESE of Twin Lakes, north of Heath Canyon, NNE of Mount San Antonio. T3N, R7W, NE1/4 of NE1/4 S 17. Trails across from Thrush Rd in Wrightwood where it hits Oak Street. (Wright) Pvt	SBD
RSA	635 ramets, 135 adults, 500 seedlings	2003	Alluvial fan above main sheep Creek drainage associated with <i>Pinus jeffreyi</i> , <i>P. monophylla</i> , <i>Cercocarpus ledifolius</i> , <i>Artemesia tridentata</i> , <i>Tetradynemia canescens</i> . <i>Bromus tectorum</i> , <i>Erodium cicutarium</i> , introduced pines and conifers present. Dumping of wooden pallets, tires, plywood nearby. Adjacent private land is undeveloped at this time. (Soza/RSA) SBNF administered by the ANF.	SBD
RSA	20	2003	Alluvial benches above Sheep Creek to the west on pvt property N side of Hwy 2, N. of Hwy 2 and Sheep Creek intersection, at east edge of Wrightwood PVT	SBD
RSA	33	2003	S side of Hwy 2, just E of Sheep Cr. Across hwy callbox, alongside a pull-out berm adjacent tto SB County Flood Control property PVT	SBD

RSA	333	2003	Heath Canyon Area. N side of Heath Canyon alongside old roadbed on N side of (below) SB County Flood Control District Road. PVT	SBD
RSA	57	2003	Western edge of Swarhout Valley, South side of Hwy 2, along dirt road used by mt bikers. Plants at yellow metal post. PVT	LA
RSA	49	2003	Blue Ridge Area. Above Gruffy Camp to west and above FS rd 3N06 to ridgetop in 5 year old burned area. USFS ANF	LA
RSA	5	2003	Blue Ridge Area. Ridgetop of Blue Ridge on disturbed road berm S side of FS rd 3N06 USFS ANF	LA
RSA	29	2003	Blue Ridge Area. N side of FS rd 3N06 USFS	LA
RSA	22	2003	Prairie Fork Area. Plants on alluvial benches on both side of creek between Old Prairie Fork Guard (Fire) Station and the springs, SE of Cabin Flat, in area that burned 5-10 years ago. Plants on N and S side of Creek. USFS ANF	LA

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*

- *LA* = Los Angeles County
- *PVT* = Private Property

Threats

On NFS lands, known threats to the 2003 Sheep Creek drainage occurrence of *Astragalus lentiginosus* var. *antonius* include trash dumping and presence of invasive non-native species (USDA Forest Service 2003). Individual plants within the Blue Ridge ridgetop occurrence may be affected by road maintenance activities. Urban development and ski area development may threaten private land occurrences (Stephenson and Calcarone 1999, USDA Forest Service 2002). Urban development adjacent to the Forest boundary may also affect habitat on NFS lands.

This species may tolerate some level of disturbance; the Sheep Creek drainage population is present on an alluvial fan, and the photograph of *Astragalus lentiginosus* var. *antonius* in the ANF Rare Plant Guide (USDA Forest Service 1995) shows habitat on a disturbed pile of rocky soil. Plants were also observed within areas burned within the last five to ten years. On private lands, plants were found along side a pull out berm, along old roadbeds, along a trail and on alluvial benches of a creek. While road maintenance may affect individuals, the resulting soil disturbance may also create habitat for this plant.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Astragalus lentiginosus* var. *antonius*:

- Determine the current distribution of *Astragalus lentiginosus* var. *antonius* on the ANF and SBNF. Relocate or confirm extirpation of the historical occurrences by continuing work begun in the 2003 relocation surveys.
- Determine if there is a need to write a species management guide for *Astragalus lentiginosus* var. *antonius*.
- Survey all new occurrences of *Astragalus lentiginosus* var. *antonius* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Astragalus lentiginosus* var. *antonius* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Astragalus lentiginosus* var. *antonius* in the Province using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Astragalus lentiginosus var. *antonius* is a narrow endemic species known from the San Gabriel and San Antonio Mountains. All but 2 historical locations were relocated in 2003 and large numbers of plants

were documented. A total of 1,183 plants were present in 9 locations. Little is known regarding the threats at many of the locations, however this species is tolerant of soil disturbance and is present after wildfire. Based on recent survey results and this analysis, *Astragalus lentiginosus var. antonius* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Astragalus lentiginosus var. antonius is a USDA Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Astragalus lentiginosus var. antonius* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Astragalus lentiginosus var. antonius* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

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***Astragalus douglasii* var.
*perstrictus***

***Astragalus lentiginosus* var.
*coachellae***

Astragalus lentiginosus var. coachellae

Astragalus lentiginosus Hook. var. *coachellae* F. Shreve & Wiggins (Coachella Valley milk-vetch)

Management Status

Federal: Endangered; Critical Habitat proposed December 14, 2004 (69 FR 74468)

California: None

Heritage Rank: G5T2; S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3 (California Native Plant Society 2001).

Critical Habitat (CH) for *Astragalus lentiginosus* var. *coachellae* was proposed by the USFWS on December 14, 2004 (69 Federal Register 74468) (U.S. Fish and Wildlife Service 2004). In determining which areas to designate as CH the USFWS considers those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These features are termed Primary Constituent Elements (PCEs) and they are summarized in the proposed rule (69 FR 74468). A final rule to designate CH for *Astragalus lentiginosus* var. *coachellae* has not been made.

General Distribution

Astragalus lentiginosus var. *coachellae* is endemic to the dune systems of the Coachella Valley area of Riverside County, California. Approximately 90% of occurrences are located between Indio and Cabazon within 3 miles of Interstate 10 (U.S. Fish and Wildlife Service 1998). The California Natural Diversity Database (2004) lists 17 occurrences, six of which are included in the table below.

Distribution in the Planning Area

There are no known occurrences of *Astragalus lentiginosus* var. *coachellae* on National Forest System lands. Potential habitat, as determined through habitat modeling, is present in Snow Creek in the San Jacinto Range, but all known occurrences of *Astragalus lentiginosus* var. *coachellae* are downstream of the San Bernardino National Forest (U.S. Fish and Wildlife Service 2001).

Taxonomy and Natural History

Astragalus lentiginosus var. *coachellae* is a dicotelydon in the legume or bean family (Fabaceae).

Astragalus lentiginosus var. *coachellae* is a winter annual or short-lived perennial herb that flowers from February to May (California Native Plant Society 2001, Spellenberg 1993). Population sizes change greatly from year to year in response to environmental conditions (U.S. Fish and Wildlife Service 1998).

Astragalus lentiginosus is a highly variable species occurring widely throughout California, and 19 varieties are recognized (Spellenberg 1993). Many of the varieties are highly range restricted, and seven are included on California Native Plant Society's List 1B (California Native Plant Society 2001). Both flowers and fruit are needed to distinguish *Astragalus lentiginosus* var. *coachellae* from other subspecies (Spellenberg 1993).

Astragalus lentiginosus var. *coachellae* is an annual to short-lived perennial that is densely silvery-hairy. The stems are ascending or clumped and 1-3 dm. The leaves are 5-11.5 cm. The 7-21 leaflets are 5-17 mm, and generally widely ovate. The inflorescence is characterized by 11-25 flowers. The axis in fruit is 3-10 cm. The petals are pink-purple. The banner is 12.7-14.5 mm, and the keel is 10.8-11.6 mm. The fruit are 16-21 mm, 9-14 mm wide, greatly inflated, stiffly papery, and grayish strigose. The beak is 3.5-6 mm. (Spellenberg 1993).

Taxonomy and Habitat Description

Astragalus lentiginosus var. *coachellae* grows on sandy flats, outwash fans, loose wind-blown sand dunes and partially stabilized and stabilized dunes and sand fields in Sonoran desert scrub, creosote bush scrub, or sagebrush dominated communities at elevations of 200–1,400 feet (60–425 meters) (California Natural Diversity Database 2004, Spellenberg 1993, U.S. Fish and Wildlife Service 1998).

Occurrence Status

Astragalus lentiginosus var. *coachellae* is known from several occurrences that are widely variable in numbers from year to year. Many of these are threatened by development and all are threatened by a net loss of sand from the dune systems resulting from habitat fragmentation and flood control projects.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Astragalus lentiginosus* var. *coachellae* (Coachella Valley milkvetch)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
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8	20 in 1982	1982	East edge of Windy Point, San Gorgonio Pass. BLM/PVT/State.	RIV
9	U	1982	San Gorgonio Pass, ca. 1.0 mi. N of mouth of Snow Canyon. PVT.	RIV
10, 11	U	1982	San Gorgonio Pass, mouth of Snow Canyon. PVT.	RIV
13	< 1000 in 1982	1982	Both sides of Snow Creek Rd, ca. 0.25 mi. SW of JCT w/ Hwy 11. Aeolian sand deposits in creosote bush scrub/ <i>Larrea-Ambrosia</i> complex. ORVs threaten. Also potential site for wind turbine farms. PVT.	RIV
15	< 10 in 1984	1984	Coachella Valley, ca. 1.6 air mi. ENE of town of Snow Creek, 0.7 mi. WSW of Palm Springs Station. In creosote bush scrub in wide wash areas on coarse sand. Wind energy conversion system planned for the area. PVT.	RIV

- *U = Unknown*
- *BLM = Bureau of Land Management*
- *RIV = Riverside County*

Threats

No occurrences of *Astragalus lentiginosus* var. *coachellae* are known to exist on National Forest System lands. Activities on National Forest System lands are not expected to have direct effects on populations occurring elsewhere. Although potential habitat for the species is present on National Forest System lands, few ongoing land use activities occur in this area, and no adverse effects to this taxon are expected (U.S. Fish and Wildlife Service (2001)).

Primary threats to *Astragalus lentiginosus* var. *coachellae* include urban development and associated modifications to the natural sand transport system that maintains the sandy habitat types. In addition, *Astragalus lentiginosus* var. *coachellae* is threatened by energy construction and maintenance projects in

occupied habitat and vehicle use off of roads.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Astragalus lentiginosus* var. *coachellae*:

- Survey all modeled habitat and any new occurrences of *Astragalus lentiginosus* var. *coachellae*; record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Astragalus lentiginosus* var. *coachellae* to document any new occurrences on NFS land.
- Map any new occurrences of *Astragalus lentiginosus* var. *coachellae* in the area using NRIS data collection standards, and incorporate these occurrences into the corporate GIS database.

Evaluation of Current Situation and Threats on National Forest System Lands

Astragalus lentiginosus var. *coachellae* is a nearly-extinct species that is currently known only to occur in alkali scrub in the Hemet area. Two historic records are near the SBNF, and suitable habitat near these localities exists on the SBNF.

Based on this analysis, *Astragalus lentiginosus* var. *coachellae* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

Astragalus lentiginosus var. *coachellae* is listed under the Endangered Species Act of 1973, as amended, as endangered, which assures that any new project proposed on NFS lands, in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

No populations of *Astragalus lentiginosus* var. *coachellae* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupported assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Astragalus lentiginosus* var. *coachellae*.

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**Astragalus lentiginosus var.
antonius**

**Astragalus lentiginosus var.
sierrae**

Astragalus lentiginosus* var. *sierrae

Astragalus lentiginosus Hook. var. *sierrae* M. E. Jones (Big Bear Valley milk-vetch)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T1; S1? (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Astragalus lentiginosus var. *sierrae* is known only from the eastern San Bernardino Mountains at White Mountain, Holcomb Valley, Big Bear Valley, Broom Flat, and the upper Santa Ana River drainage (California Natural Diversity Database 2004).

Distribution in the Planning Area

There are over 30 known occurrences of *Astragalus lentiginosus* var. *sierrae* on the San Bernardino National Forest. These occurrences range from White Mountain, Big Bear Lake, Holcomb Valley, Big Pine Flat, Baldwin Lake, Broom Flat, Tip Top Mountain, to the South Fork of the Santa Ana River and Barton Flats.

Taxonomy and Natural History

Astragalus lentiginosus var. *sierrae* is a dicotyledon in the legume family (Fabaceae). *Astragalus lentiginosus* is highly variable; 23 varieties are recognized, distinguished primarily on the basis of leaf, flower, and fruit characteristics (Spellenberg 1993). This taxon is a perennial herb that blooms between April and August (California Native Plant Society 2001).

Astragalus lentiginosus var. *sierrae* is a thinly strigose perennial. The stems are open and widely branched, more or less matted, and 1-3.5 dm. The leaves are 2-5 cm. There are 15-21 leaflets, 3-8 mm, which are generally crowded, obovate, and have generally arched midribs. There are 5-15 flowers, and

the axis in the fruit is 1-3 cm. The calyx lobes are less than 1.2 mm, the petals are whitish, and the tips are more or less pink-tinged. The banner is 10.4-14.5 mm, and the keel is 8.1-9.8 mm. The fruit are 15-22 mm, 8-15 mm wide, plumply ovoid, bladdery, papery, and sparsely strigose. The beak is 3-6 mm (Spellenberg 1993).

Habitat Description

Astragalus lentiginosus var. *sierrae* grows in arid areas on gravelly or sandy soil in mesic meadow margins, heavy clay soils, or carbonate areas of montane conifer forest, pinyon-juniper woodlands, sagebrush flats, and Mojavean desert scrub, at elevations between 5,900 and 8,530 feet (1800-2600 m). In the Santa Ana River watershed, *Astragalus lentiginosus* var. *sierrae* occurs with rabbitbrush, sagebrush, and Jeffrey pine where it has been found in association with *Muhlenbergia rigens*, *Quercus kelloggii*, *Amelanchier utahensis*, *Achillea millefolium*, *Artemisia dracuncululus*, and *Gutierrezia microcephala*. Occurrences have also been found with *Sidalcea pedata*, *Thelypodium stenopetalum*, *Packera bernardina*, *Astragalus bicristatus*, and *Hulsea vestita* var. *parryi* (California Natural Diversity Database 2002). At White Mountain, Holcomb Valley, part of the north shore of Big Bear Lake, Sugarlump, and Tip Top, *Astragalus lentiginosus* var. *sierrae* grows on carbonate soils (USDA Forest Service 2002).

Occurrence Status

There are nineteen occurrences in the California Natural Diversity Database (2002), and at least seven that have not yet been included in the database (USDA Forest Service 2002). In addition, there are seven occurrences from the Rancho Santa Ana Database, and nine from the University of California Riverside database.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Astragalus lentiginosus* var. *sierrae* (Big Bear Valley milk-vetch)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1993	SE shore of Baldwin Lake, both sides of Shay Rd. Sagebrush flats on sandy soils. Housing development = potential threat. Land owner: U	SBD

2		U	NE end of Baldwin Lake. Eastern shore in sagebrush flats. Housing development = potential threat. Land owner: U.	
342822 (RSA)		1978	Baldwin Lake: Alkaline meadow at the N end of Baldwin Lake, S of Highway 18. Elev. ca. 6700 feet(Thorne/RSA)	SBD
3				
	5 in Campground (1999), 100 in 3 colonies S of Hwy 38 (2000)	1993, 2000	N shore of Big Bear Lake, E and W of Solar Observatory, both sides of Hwy 38. Sandy soils in undisturbed openings in Jeffrey pine/western juniper woodland w/ <i>Artemisia tridentata</i> , <i>Chrysothamnus nauseosus</i> , <i>Taraxacum officinale</i> , <i>Muhlenbergia rigens</i> . 4 colonies. North colony N-Serrano Camp site #124. Three colonies S of Hwy 38. SBNF, PVT?	SBD
4				
	50 in 2000	1993, 2000	N Shore of Big Bear Lake, just 0.25-0.35 mi. W of Stanfield Cutoff, both sides of Hwy 38. Sandy soils in undisturbed openings in Jeffrey pine/western juniper woodland with <i>Artemisia tridentata</i> , <i>Chrysothamnus nauseosus</i> , <i>Astragalus leucolobus</i> , <i>Castilleja</i> spp., <i>Muhlenbergia rigens</i> . Land owner: SBNF	SBD
5				
	U	U	Tip Top Mountain vicinity. SBNF.	SBD

6	U	1942	South Fork Campground, South Fork Santa Ana River, E of Barton Flats. Dry flats. SBNF.	SBD
7	130 in 1994	1994	Heart Bar Equestrian Group site along Santa Ana River. Camping and horseback riding. Trails nearby, equestrian area proposed for site. Jeffrey pine forest w/ <i>Amelanchier utahensis</i> , <i>Lotus crassifolius</i> , <i>Amorpha californica</i> , <i>Quercus kelloggii</i> , <i>Abies concolor</i> , <i>Juniperus occidentalis</i> , <i>Elymus elymoides</i> , <i>Artemisia tridentata</i> , <i>Chrysothamnus nauseosus</i> , <i>Astragalus bicristatus</i> , <i>Hulsea vestita</i> ssp. <i>parryi</i> . N side of Forest Road 1N02, 860' NW of group site. SBNF.	SBD
8	20	2000	South Broom Flat, 2.2 mi. NNW of Onyx Peak summit, E of Pacific Crest Trail. Just W of FR 2N01, opposite 2N04. Moist meadow w/ <i>Elymus elymoides</i> , <i>Eriogonum</i> spp., <i>Artemisia tridentata</i> , <i>Chrysothamnus nauseosus</i> , <i>Potentilla</i> spp., <i>Achillea millefolium</i> , <i>Castilleja cinerea</i> . Potential threats = grazing and ORV use from Forest Road 2N01. SBNF.	SBD

9	50 in 2000	2000, 2001	<p>Big Meadows, N of the Santa Ana River, from 0.3 mi. W to 0.6 mi. E of Skyline Group Camp, SE of Moonridge. Threats include foot traffic, horses, grazing, camping, ORV use. Montane conifer understory w/ <i>Chrysothamnus nauseosus</i>, <i>Artemisia dracunculus</i>, <i>Ceanothus</i> spp., <i>Castilleja</i> spp., <i>Tragopogon</i> spp., various grasses. Dry, sandy soil. In 2001, plants found in wet meadow and 2 observed at Heart Bar work station near seldom used helispot. SBNF.</p>	SBD
10	20	2000	<p>North Converse Flats, 0.5 mi. NNE of Seven Oaks, near Converse Station, N of Santa Ana River. Along inaccessible road, though past use is apparent. Sagebrush scrub w/ <i>Artemisia tridentata</i>, <i>Chrysothamnus nauseosus</i>, <i>Artemisia dracunculus</i>, <i>Bromus tectorum</i>, <i>Erodium cicutarium</i>, <i>Lupinus</i> spp., <i>Achillea millefolium</i>. Dry soils. SBNF.</p>	SBD

11	100	2000	SE shore of Baldwin Lake, just E of sewage disposal facility, 0.9 mi. NE of JCT of Shay Rd/ Hwy 38. Small ORV trail and lightly used paths through meadow. Dry meadow dominated by grasses. w/ <i>Artemisia tridentata</i> , <i>Chrysothamnus nauseosus</i> , <i>Artemisia dracunculus</i> , <i>Chrysothamnus nauseosus</i> , <i>Sidalcea pedata</i> , <i>Thelypodium stenopetalum</i> , <i>Achillea millefolium</i> , <i>Potentilla anserina</i> . Fence around portion of meadow. SBNF.	SBD
12	2	2000	S of Baldwin Lake, btw. Shay Rd. and Big Bear Blvd., 0.5 mi. E of junction of Shay Rd/ Hwy 38. Foot paths, equestrian paths. Sagebrush community bordering meadow w/ <i>Artemisia tridentata</i> , <i>A. ludoviciana</i> , <i>Potentilla wheeleri</i> , <i>Gutierrezia microcephala</i> , <i>Poa secunda</i> , <i>Poa pratensis</i> , <i>Lupinus</i> spp., <i>Achillea millefolium</i> . SBNF.	SBD
13	50	2000	N of E end of Big Bear Lake, ca. 0.6 mi. S/SE of Blue Quartz Mine, W of Big Bear City. Foot traffic may be threat. Dry alkaline meadow w/ grasses, <i>Artemisia ludoviciana</i> , <i>Potentilla anserina</i> , <i>P. glandulosa</i> , <i>Horkelia</i> , <i>Lupinus</i> , <i>Packera bernardina</i> , <i>Taraxacum californicum</i> . SBNF.	SBD

14	15-20	1999	N of Holcomb Creek, 0.4 mi. SW of Hitchcock Springs, N of Fawnskin and Big Bear Lake. Just E of small mining claim. Jeffrey pine forest and <i>Cercocarpus ledifolius</i> / <i>Artemisia tridentata</i> scrub. w/ <i>Monardella linoides</i> , <i>Eriophyllum confertiflorum</i> , <i>Melica stricta</i> . Loose granitic gravel. Steep slope N of FR 2N08. SBNF.	SBD
15	60	1999	Just W of Holcomb Valley, 0.7 mi. W of Hitchcock, both sides of Holcomb Creek. Two colonies. Old dirt road in low sagebrush flat w/ <i>Artemisia tridentata</i> , <i>A. nova</i> , <i>Packera bernardina</i> . Site is fenced. Potential threats = invasives, flooding from nearby ranch. SBNF.	SBD
337788 (RSA)	U	1979	Holcomb Valley; along Holcomb Creek below Hitchcock Ranch, where 3N12 crosses the creek; elev. ca. 7150 feet (Thorne/RSA)	
16	40	1999	Meadows Edge Picnic area, N of Big Bear Lake, 0.5 mi. WSW of Big Bear Ranger Station. Developed picnic area w/ <i>Pinus jeffreyi</i> , <i>Juniperus</i> , <i>Chrysothamnus nauseosus</i> , <i>Arctostaphylos</i> . SBNF.	SBD

17	260	2000	Big Bear Ranger Station compound and adjacent meadow, N of Hwy 38, 3 mi. E of Fawnskin. Site fairly protected by fence. Wet meadow w/ <i>Carex</i> , <i>Juncus</i> , <i>Poa</i> , <i>Muhlenbergia rigens</i> , <i>Salix</i> , <i>Artemisia tridentata</i> , <i>Chrysothamnus nauseosus</i> . SBNF.	SBD
18	634	2001	White Mountain Ridge, White Mountain Peak, extending 0.5 km to SW, N of Big Pine Flat/Butler Peak. Dirt road through site. Area burned lightly in 1999, but plants not negatively affected. Pinyon woodland w/ scattered Jeffrey pine. Rocky sandy-loam soils. w/ <i>Quercus chrysolepis</i> , <i>Pinus monophylla</i> , <i>P. jeffreyi</i> , <i>Argemone munita</i> , <i>Penstemon</i> , <i>Gayophytum diffusum</i> , <i>Turricula parryi</i> , <i>Ephedra viridis</i> , <i>Oxytheca parishii</i> ssp. <i>goodmaniana</i> , <i>Astragalus bicristatus</i> , <i>Abronia nana</i> ssp. <i>covillei</i> . Both sides of Forest Road 3N17. SBNF.	SBD
19	13	2000	Big Pine Flat, along Crab Flats Road 0.15 mi. S of intersection w/ Coxey Rd, N of Butler Peak. w/in a proposed salvage unit, but activities will avoid site. S side of wet meadow in granitic soils w/ <i>Antennaria dimorpha</i> . SBNF.	SBD

672202 (RSA)	10	2002	Green Canyon, along trail 2E18 to Sugarloaf Mtn. In canyon bottom at base of N-facing slope on dry gravelly, rocky soil. Mixed conifer forest of <i>Juniperus occidentalis</i> , <i>Pinus jeffreyi</i> , <i>Abies concolor</i> . w/ <i>Poa fendleriana</i> , <i>Bromus tectorum</i> , <i>Apocynum cannabinum</i> , <i>Salix</i> cf. <i>lasiolepis</i> , <i>Artemisia dracuncululus</i> , <i>Castilleja applegatei martinii</i> , <i>Penstemon labrosus</i> , <i>Solidago confinis</i> , <i>Solidago californica</i> , <i>Rosa woodsii</i> , <i>Erigeron divergens</i> , <i>Cornus sericea</i> , <i>Cercocarpus ledifolius</i> , <i>Leymus triticoides</i> , <i>Lupinus andersonii</i> , <i>Ribes nevadense</i> , <i>Ceanothus cordulatus</i> , <i>Chrysothamnus nauseosus</i> . SBNF. (Peirson/ RSA 1930)	SBD
90251 (RSA)	U	1930		
*	U	2003	Sugarlump, near top of Geronomo ski run and along 2N21, on dolomite-derived soils.	SBD
*	U	2002	Cloudy Quarry, Holcomb Valley	SBD
*	U	2003	Alden Road site with heavy clay soils. With multiple rare plants. City of Big Bear Lake, zoned commercial. Ownership Big Bear Mutual Water Company. At risk of loss to development.	SBD

340165 (RSA)	U	1979	Rose Mine; elev. ca. 6870 feet. RSA	SBD
*	U	1977	San Gorgonio Wilderness: along Summit Ridge Trail in Anderson Flat, elev. ca. 10,600 ft. RSA	SBD
*	~50	2004	Lakeview Recreation Tract, north side of Bear Lake, SBNF. Occurrences scattered across tract, near homes, trails and roads. (VinZant/USFS)	SBD
*	100's	2004	At end of FS road 1N39 B spur and in Heart Bar Youth Detention Camp grounds, SBNF. Subject to trampling and OHV activities. (VinZant/ USFS)	SBD
*	U	2004	From chair 9 of Bear Mountain Ski Resort east across Sugarloaf Ridge to unnamed peak of 8838 feet, SBNF. Many occurrences scattered across north facing slope. (VinZant/USFS)	SBD
7814 (UCR)	U	1968	0.5 mi. W of Rose Mine, 100 yards away from main road (west side) (Jones/UCR)	SBD
4956 (UCR)	U	1966	Grout Bay Campground, N shore Big Bear Lake [near Fawnskin] (Clarke/UCR)	SBD
39536 (UCR)	U	1983	Near Onyx Summit at Cienega Seca, W of Hwy 38 T2N/R2E/ S12 (Boyd/UCR)	SBD

72416 (UCR)	U	1992	W side of Rose Valley, T2N/R3E/S18, (LaRue/UCR)	SBD
100146 (UCR)	U	1994	Mountain Crest above Lucerne Valley: Vicinity of Pluess-Staufer mining operations, S of Crystal Creek and N of Fawnskin, T3N/R1W/S23 (White/UCR)	SBD
113528 (UCR)	U	1998	S of Furnace Cyn., ca. 0.6 miles west of John Peak (8202), T3N/R1W/S24 (Provance/UCR)	SBD
117646 (UCR)	U	1997	Holcomb Valley area: Old Pluess-Staufer "Cloudy" limestone quarry revegetation area T3N/1W/S25 (White/UCR)	SBD
124718 (UCR)	U	1933	East Blue Ridge, Big Pines Park, Angeles National Forest (Templeton/UCR) Possible misidentification?	LA
130795 (UCR)	U	1999	Big Bear Valley, south side of Baldwin Lake, Palomino Dr. ca. 1/4 mi. N of Shay Rd. at entrance to wastewater treatment facility, proposed expansion area, T2N/R2E/S7 (Sanders/UCR)	SBD
195466 (RSA)	U	1963	Lower area of Santa Ana fork, off California 38(Gunn/RSA)	SBD

283135 (RSA)	U	1977	San Bernardino Mts., San Gorgonio Wilderness: along Summit Ridge Trail in Anderson Flat, elev. ca. 10,600 ft. (Thorne/RSA)	SBD
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- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

Threats

Astragalus lentiginosus var. *sierrae* is threatened by urbanization on private lands (California Native Plant Society 2001). Occurrences on private lands not yet developed are threatened by unauthorized uses such as bike trail and ramp construction and trash dumping by adjacent landowners and yard maintenance where plants occur next to dwellings.

Threats to occurrences on the SBNF include disturbance from trampling, equestrian trail use, carbonate mining activities, prospecting, recreational activities at dispersed and developed sites, developed and administrative site maintenance and road maintenance. Fuel treatments within Wildland Urban Interface defense and threat zones at developed sites, sites under special use permit and along perimeters of housing tracts will also affect occurrences in the near future. Unauthorized uses such as off road driving, target shooting and dumping also affect occupied habitat. *Astragalus lentiginosus* var. *sierrae* may respond positively to some disturbance and is now thought to be more common than previously mapped. One occurrence burned lightly on White Mountain, but appeared to recover. However, it is unknown how plants would respond to intense burning (USDA Forest Service 2002). Some locations which co-occur with federally listed species have benefited over the past 6 years by conservation actions to protect listed plant habitat and meadow habitats on the Mountaintop Ranger District.

Conservation and Management Considerations

The primary conservation strategy for *Astragalus lentiginosus* var. *sierrae* is to implement the Meadow Habitat Management Guide and the Carbonate Habitat Management Strategy (CHMS), and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Implement strategies in the Meadow Habitat Management Guide and CHMS to the greatest extent practicable.

- Survey all new occurrences of *Astragalus lentiginosus* var. *sierrae* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Astragalus lentiginosus* var. *sierrae* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least five years prior.
- Map known and new occurrences of *Astragalus lentiginosus* var. *sierrae* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.
- Confirm identification of voucher from Big Pines Park, Angeles National Forest (UCR 124718) in table above. This would be a range extension for this taxon.

Evaluation of Current Situation and Threats on National Forest System Lands

Astragalus lentiginosus var. *sierrae* is a locally-common narrow endemic species known only to occur in the eastern San Bernardino Mountains, generally associated with meadow margins or carbonate soils. Some of these habitats are protected from identified threats, although most others are not well protected.

Based on the above analysis, *Astragalus lentiginosus* var. *sierrae* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	A	A	C	A

Astragalus lentiginosus var. *sierrae* is a USDA Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The viability of this species is tied to protection and management of meadow and carbonate habitats. Existing protections of these habitats for the benefit of the associated federally listed plant species provide considerable baseline protection. With implementation of the Meadow Habitat Management Guide and the Carbonate Habitat Management Strategy, viability for this species on NFS lands is secure. Consideration of the Suitable Use restricting motorized and mechanized vehicle travel to designated

National Forest System roads and trails, along with Standards related to rare species management, riparian areas, and recreation use factor into these outcomes. Presumed implementation of the Meadow Habitat Management Guide and Carbonate Habitat Management Strategy is key to the outcomes.

Due to the fact that this taxon occurs in locations with a high level of multiple impacts, threats will persist under all alternatives. At this time, there are a large number of occurrences on NFS lands. Occurrences within the existing San Geronio Wilderness will retain protection across all alternatives. Many occurrences will retain protection within the existing North Baldwin Lake/Holcomb Valley Special Interest Area under all alternatives. In Alternatives 2-6, Standard S33 would provide a higher level of protection within this SIA as new projects are proposed. Predicted outcomes were also based on zoning and Special Area designation analysis at several locations across the range of this taxon, with the exception of the Heartbar occurrence because it was a developed site.

Under Alternative 1, this species would continue to be at risk from unauthorized vehicle travel off Forest Transportation System roads and trails. The existing Back Country Non-Motorized zoning on Sugarloaf and Bertha Ridge provide a higher level of protection at these localities. Conservation methods provided under the Southern California Conservation Strategy would continue to provide protection to localities where this taxon co-occurs with federally listed species.

Under Alternative 2, Back Country Non-Motorized zoning on White Mountain, the Bertha and South Baldwin Lake Critical Biological zones, and southern portion of the recommended Sugarloaf wilderness would provide a much higher level of protection over the long term.

Under Alternative 3, Back Country Non-Motorized zoning on White Mountain, the full extent of the recommended Sugarloaf Wilderness, and the Bertha Ridge and South Baldwin Lake Critical Biological zones would provide the highest level of protection to occupied habitat. In addition, recommendation of the Heartbreak Ridge Wilderness which is potential habitat is included in this outcome.

Alternative 4 would be the same as 3 without the Heartbreak Ridge Wilderness recommendation.

Alternative 4a would have the same land use zones and Special Area recommendations as Alternative 2 except that the Sugarloaf Wilderness is not recommended, the south half of the mountain would be retained as Back Country Non-Motorized zoning while the north half would be zoned Back Country Motorized Use Restricted to allow access for future vegetation treatments within the Wildland Urban Interface defense and threat zones, and the Heartbreak Ridge Wilderness is recommended.

Under Alternative 5, no land use zoning protections or Special Area designation recommendations would be afforded this species. The reduction of Back Country Non-Motorized to Back Country zoning would also be expected to degrade additional habitat over the long term.

Alternative 6 includes a large increase in Back Country Non-Motorized zoning and is otherwise similar to Alternative 2 for this taxon.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

The private lands of Big Bear Valley, including Big Bear City and Fawnskin, have been highly reduced and fragmented by residential and commercial development. The remaining fragments continue to be lost as continued development occurs. While it is presumed that habitat of this taxon will continue to be reduced due to private land development, this loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF.

By maintaining the current distribution of *Astragalus lentiginosus* var. *sierrae* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Astragalus lentiginosus* var. *sierrae* to suffer a decline in its overall distribution.

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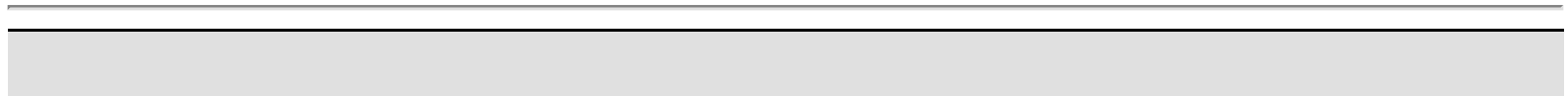
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**Astragalus lentiginosus var.
coachellae**

Astragalus leucolobus

Astragalus leucolobus

Astragalus leucolobus Jones (Bear Valley woollypod)

Management Status

Federal: Forest Service Watch List

State: None

Heritage Rank: G2, S2.2

California Native Plant Society (2001): List 1B, R-E-D Code 2-2-3

General Distribution

Astragalus leucolobus, Big Bear Valley woollypod, is known from 24 documented occurrences and 17 general locations in the mountain regions of San Bernardino, Riverside (San Jacinto Mountains), Los Angeles (San Gabriel Mountains), and San Benito Counties. Potential habitat exists in San Diego County. Other occurrences are known but not yet recorded in the California Natural Diversity Database (Stephenson and Calcarone 1999).

Distribution in the Planning Area

Astragalus leucolobus occurs on the San Bernardino and Angeles National Forests. The species is locally common in the Big Bear Valley of the San Bernardino Mountains. This plant is found in several locations on the San Bernardino National Forest, including but not limited to Polique Canyon, Arrastre Flat, Holcomb Valley, North Baldwin Lake, Rose Mine, Jenks Lake, Heart Bar and Coon Creek (USDA Forest Service 1997). Historic collections were made on or adjacent to the Los Padres National Forest, but the identification of specimens from this area is questionable (California Natural Diversity Database 2001). This species has the potential to occur on the Cleveland National Forest.

Taxonomy and Natural History

Astragalus leucolobus is a dicot in the legume family (Fabaceae) (Spellenberg 1993). *Astragalus leucolobus* is a perennial herb that blooms May-July (California Native Plant Society 2001).

Habitat Description

Astragalus leucolobus is found in lower montane coniferous forest; upper montane coniferous forest; pebble plains; openings of yellow pine forest and pinyon-juniper woodland; and dry, rocky areas with sagebrush. The species also occurs in areas with disturbed soils (e.g., on fuel breaks, within residential tracts, and adjacent to roads) (Stephenson and Calcarone 1999).

Occurrence Status

This species is common and individual occurrence data is not provided here.

Threats

Astragalus leucolobus is threatened by development and unauthorized off-highway vehicle activity (California Native Plant Society 2001).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Astragalus leucolobus*:

- Because the plant occurs in areas with disturbed soils (on fuel breaks, within residential tracts, and adjacent to roads), surveys should be conducted prior to future clearing, building construction, and road improvements to determine viable protection measures for the species if it is present.

Evaluation of Current Situation and Threats on National Forest System Lands

Astragalus leucolobus is distributed in a limited number of occurrences in California and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). Population trends for this species are unknown (California Natural Diversity Database 2001). Vulnerability of this species is considered low on National Forest System lands (Stephenson and Calcarone 1999).

This plant appears to be disturbance tolerant and has been observed on roadsides, within roads, at the Holcomb Trials area, and at sites following construction activities (USDA Forest Service 1997). Many occurrences on the San Bernardino National Forest receive protection where plants co-occur with federally listed species. Habitat has been protected by recent habitat conservation measures such as road obliteration, relocation of special use events that affect habitat, fencing, signing, and environmental education.

Based upon the above analysis this species has been assigned the following threat category:

3. Common and widespread in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Astragalus leucolobus is on the San Bernardino National Forest Watch List. During project surveys, information will be recorded on occurrences to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Astragalus leucolobus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for All Lands within Range of the Taxon

By maintaining the current distribution of *Astragalus leucolobus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Astragalus lentiginosus var. sierrae	Astragalus oocarpus
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Astragalus oocarpus

Astragalus oocarpus A. Gray (San Diego locoweed, Descanso milk-vetch, San Diego milk-vetch)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Astragalus oocarpus, Descanso milkvetch, is endemic to the Peninsular Ranges of central San Diego County (Spellenberg 1993). Occurrences are located on or near Palomar, Cuyamaca, and Volcan mountains.

Distribution in the Planning Area

Within Southern California National Forest System lands, *Astragalus oocarpus* is only known from the Cleveland National Forest (CNF) on both the Palomar and Descanso Ranger Districts.

Taxonomy and Natural History

Astragalus oocarpus is a stout herbaceous perennial in the pea family (Fabaceae). Stems are hollow, glabrous, and widely ascending to erect, from 6 to 13 dm tall. Leaves have 17 to 35 leaflets, with a prominently veined midrib on the under surface and in a groove on the upper surface. There are 20 to 75 cream-colored flowers in the inflorescence. The banner is recurved from 70 to 90°. Fruits are erect, 15 to 25 mm long and 10-16 mm wide, generally inflated, stiffly papery, and persistent (Spellenberg 1993). Plants flower from June through August (California Native Plant Society 2001).

Habitat Description

Astragalus oocarpus occurs in cismontane chaparral edges at the periphery of meadows (Reiser 1994)

and in chaparral openings and cismontane woodlands at elevations between 2,000 and 5,000 feet (610-1,520 meters) (California Native Plant Society 2001). Plants are also found along roadsides and in moderately disturbed areas (USDA Forest Service 1998). *Astragalus oocarpus* is often associated with *Arctostaphylos* sp. (manzanita) and *Adenostoma fasciculatum* (chamise) in coarse sandy loam. Reiser (1994) states that “as with many *Astragalus*, mild soil disturbance may be a factor in facilitating the spread of populations.”

Occurrence Status

The California Natural Diversity Database (CNDDDB) (2004) reports 28 occurrences. Seven occurrences are old, unconfirmed sightings needing additional field reconnaissance; 13 are located on private lands; three are within the Cuyamaca State Park; and one is located on land administered by the City of San Diego. All occurrences are presumed extant.

The remaining four occurrences are on the Cleveland National Forest, with three locations on the Palomar Ranger District and one on the Descanso Ranger District. Cleveland NF records 2-1 and 2-2 are old sightings, needing confirmation. There is another occurrence reported from Cedar Creek Falls (Reiser 1994). Forest botanists have not observed plants in this location; however there is potential habitat along the San Diego River (Winter, pers. comm. 2003). Cedar Creek Falls itself and adjacent lands are managed by the Cleveland National Forest; the splash pool beneath the falls is managed by Helix Water District. *Astragalus deanii* is also present within the San Diego River canyon (Winter pers. comm. 2003). Reiser (1994) also mentions an occurrence in Black Canyon, 1 mile south of Mesa Grande, which may also be on the Cleveland National Forest. There is a possibility the occurrence on the east side of Cajon Mt (28667 (UCR)) may also occur on the Cleveland National Forest.

OCCURRENCE DATA - *Astragalus oocarpus* (San Diego milk-vetch)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
1	U	55 in 1987	1987	ALONG THE SWEETWATER RIVER ABOUT 0.6 MILE WEST OF GREEN VALLEY FALLS, CUYAMACA RANCHO STATE PARK.	SD

2	U	2 in 1987	1987	ALONG BOULDER CREEK RD, 2.0 MI N OF DESCANSO. 1.1 MILES NORTHWEST OF INTERSECTION OF BOULDER CREEK AND OAK GROVE DRIVE. ON BOTH SIDES OF THE ROAD.	SD
3	U	< 10 in 1980, 2 in 1987	1987	ALONG OAK GROVE DR, DESCANSO. W OF HULBURD GROVE. 0.1 MI WEST OF JCT OF OAK GROVE DR AND OAK GROVE DR (SIDE STREET). SOUTH SIDE OF OAK GROVE DRIVE.	SD
5	U	10 in 1987	1987	APPROX. 1.7 ROAD MI E OF SANTA YSABEL; MOSTLY ALONG EAST SIDE OF RIVERWOOD RD. PLANTS FOUND ALONG DIRT GRADING OR OLD ROAD E OF RIVERWOOD RD AND ON BOTH SIDES OF STREAM IN DEEP DITCH.	SD
6	U	U	1936	5 MI N OF SANTA YSABEL, T11S/R03E	SD
7	U	U	1936	CARRIZO CR NEAR LK HENSHAW, T11S/R03E	SD
8	U	U	1936	BLACK CANYON, 1 MI S OF MESA GRANDE, T11S/R02E/S33	SD

9	U	U	1935	PALOMAR MOUNTAIN. COLLECTED NEAR WYSS(?) RANCH. EXACT LOCATION NOT KNOWN; MAPPED IN GENERAL VICINITY OF SUMMIT OF PALOMAR MOUNTAIN.	SD
10	2-1	U	1936	Pine Hills (Palomar) / CNF?	SD
11	2-2	U	1878	San Diego River / CNF?	SD
12	U	0 in 1987	1982	GREEN VALLEY AREA CAMPGROUND, ALONG THE SWEETWATER RIVER NEAR ARROYO SECO, CUYAMACA RANCHO STATE PARK. TWO COLONIES MAPPED ALONG ROADS WITHIN THE CAMPGROUND.	SD
13	U	U	1983	SOUTHERN SLOPES OF AIRPLANE RIDGE ALONG UPPER ARROYO SECO, CUYAMACA RANCHO STATE PARK. SINGLE COLONY MAPPED ABOUT 0.4 MILE DUE SOUTH OF 4865' BENCHMARK ALONG AIRPLANE RIDGE.	SD
14	U	100 in 1994	1994	ALONG LUSARDI TRUCK TRAIL (FS RD 11S03), APPROX 0.3 AND 0.6 MI ABOVE (SOUTH OF) HWY 76 (2 SUBPOPULATIONS).	SD

15	2-3	1 in 1994	1991	NE-FACING SLOPE OF PINE HILLS, JUST NE OF JEEP TRAIL, BETWEEN DYCHE VALLEY AND WILL VALLEY. SE 1/4 OF NW 1/4 OF SECTION 20. Palomar Observatory/ CNF	SD
16	U	75 in 1987	1987	APPROX. 1.6 MI SE OF SANTA YSABEL PEAK; JUST SW OF INTERSECTION OF RD BIA52 AND BIA54.	SD
17	U	100 in 1987	1987	APPROX. 2.2 MI SE OF SANTA YSABEL PEAK; BOTH SIDES OF RD B1A54. 1.9 MILES FROM INTERSECTION W/ SCHOOLHOUSE CANYON RD.	SD
18	U	1 in 1994	1994	APPROX. 0.3 MI S OF LOVELAND RESERVOIR, ALONG WEST BOUNDARY TRUCK TRAIL (FS ROAD 16S02). EAST SIDE OF TRUCK TRAIL.	SD
19	U	U	1922	3 OR 4 MILES EAST OF DULZURA. EXACT LOCATION UNKNOWN; MAPPED AS BEST GUESS BY CNDDDB APROXIMATELY 3.5 MILES EAST OF DULZURA ALONG HIGHWAY 94.	SD

20	U	U	1993	DESCANSO, ALONG RILEY WAY WEST OF CENTRAL AVENUE, NORTH OF DEXTER PEAK. ON NORTH SIDE OF RILEY WAY POSSIBLY IN A DRIVEWAY OF PRIVATE LANDOWNER. MAPPED WITHIN THE SW 1/4 OF THE NE 1/4 OF SECTION 24.	SD
21	U	U	U	ECHO VALLEY. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB IN VICINITY OF ECHO VALLEY.	SD
22	2-5	1	2001	WEST OF POSER MOUNTAIN BOY SCOUT CAMP, GOUDIE ROAD 1.3 MILES EAST OF JUNCTION WITH CONEJOS VALLEY ROAD, CLEVELAND NF. ON EAST SIDE OF GOUDIE ROAD (UNIMPROVED), BETWEEN ROAD AND KING CREEK. MAPPED WITHIN THE NW 1/4 OF THE NW 1/4 OF SECTION 9. Poser Mt. Boy Scout Camp / CNF	SD
23	U	65 in 2003	2003	SANTA YSABEL PRESERVE, HEAD OF WITCH CREEK, NORTH OF HIGHWAY 78. IN WEST PARCEL OF PRESERVE. MAPPED WITHIN THE SW 1/4 OF THE SW 1/4 OF SECTION 29.	SD
24	U	U	U	BALLENA. MAPPED AS BEST GUESS BY CNDDDB IN BALLENA VALLEY.	SD

25	U	U	U	EASTERN SAN PASQUAL VALLEY. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS AT EASTERN END OF SAN PASQUAL VALLEY BY CNDDDB.	SD
26	U	U	U	JEFF VALLEY ON PALOMAR MOUNTAIN. ALONGSIDE TRAILS.	SD
27	U	U	U	0.25 MILE SOUTHEAST OF AGUANGA NEAR HIGHWAY 79. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB ALONG HIGHWAY 79 0.25 MILE SOUTHEAST OF AGUANGA, IN VICINITY OF JUNCTION WITH HIGHWAY 371.	SD
28	U	U	1920	GRAPEVINE SPRINGS, EAST OF WARNER PASS. MAPPED AT GRAPEVINE SPRINGS BY CNDDDB. ELEVATION ON HERBARIUM LABEL IS 2100 FEET; PRESUMED TO BE INCORRECT BY CNDDDB. ELEVATIONS IN VICINITY OF GRAPEVING SPRINGS ARE 3200-3400 FEET.	SD
28667 (UCR)	U	U	1976	Peninsular Range, SE. side of El Cajon Mt., above El Capitan Reservoir, along the truck trail, elev. 2000-3000 ft. Lat:32 ° 54'N/ Lon:116 ° 48'W (Sanders/UCR)	SD
14520 (UCR)	U	U	1974	Along roadside of Hwy 79 in Dodge Valley (Helmkamp/UCR)	SD

3830 (UCR)	U	U	1964	Camp Marston, near Julian, elev. 4000 ft.(Minnich/UCR)	SD
44576 (UCR)	U	U	1983	E. side of Hwy. 78, 2.5 mi. E. of Jct. With Hwy 79 at Santa Ysabel, elev. 3500 ft. (Armstrong/UCR)	SD

- *U = Unknown*
- ** an occurrence number has not been assigned*
- *SD = San Diego County*
- *CNF = Cleveland National Forest*

Threats

Astragalus oocarpus may be threatened with loss of habitat and lack of protection throughout its range (USDA Forest Service 1998), however the montane populations of this taxon were presumed stable in 1994 (Reiser). Reiser (1994) states that “while this *Astragalus* may actually increase in numbers where soils are mildly disturbed, heavy horse or vehicle traffic (in the Cuyamaca Mountains) could reverse such a trend and all populations should be protected. “

Threats to the Cleveland NF occurrences are unknown. Occurrences 2-1, 2-2, and 2-3 are in remote locations receiving few visitors. For potential locations within the San Diego River Canyon, dispersed recreation activities may affect habitat, but effects cannot be predicted without surveys of the area, as plants could occur on steep slopes and not be affected at all or may occur on flat ground where dispersed use occurs. CNF occurrence 2-5 is adjacent to a Forest system road and near privately owned lands. The one plant at CNF occurrence 2-5 may receive mild disturbance due to the proximity to a Forest system road (15S24, Guodie Road) and privately owned lands. The status of the occurrence in Black Canyon is unknown. Several populations were burned in the 2003 Cedar fire; the effects of the fire on the seed bank for this species are unknown but may be beneficial.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Astragalus oocarpus*.

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas. Pay particular attention to occurrences burned in the 2003 Cedar fire.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Allow wildland fires to freely burn through known occurrences. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening

these roads as part of fire suppression activities as some populations are adjacent to roads. Use ridgelines or base of mountains for fuel break construction. The use of hand line for fuel break construction is preferred.

Evaluation of Current Situation and Threats on National Forest System Lands

Astragalus oocarpus is considered to have moderate to high vulnerability on National Forest System lands. Although three of the four populations on the Cleveland NF are in remote locations receiving few visitors, occurrences are limited and population numbers are limited from one to a few plants. The extent of the species' seed bank at these locations is unknown. These occurrences may be susceptible to local extirpation from routine Forest Service activities due to the small population size. Due to the limited amount of information on this taxon, the effects, negative or beneficial, of the 2003 Cedar fire on occurrences cannot be predicted at this time.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon narrow endemic in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes on National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	C	B	C	A

Astragalus oocarpus is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Occurrences of *Astragalus oocarpus* on National Forest System lands are at risk for local extirpation under all alternatives due to their small size (one to a few plants) and unknown seed bank extent. Effects of the 2003 Cedar Fire on occurrences is not yet known. However, the suggestion that mild soil disturbance may be a factor in facilitating the spread of populations and that this *Astragalus* may actually increase in numbers where soils are mildly disturbed (Reiser 1994), indicate that plants may continue to exist and may even favor some level of disturbance.

Under Alternative 1, some of the habitat would be continue to be managed within the Back Country Non-Motorized zone, however the majority of the occurrences would be managed under Back Country

zoning increasing the possibility that road maintenance activities or unauthorized off road driving could damage or kill plants. The current management of this taxon would be retained.

Under Alternative 2, the majority of the occurrences would be managed in locations recommended for the San Diego River Gorge Wilderness and the candidate San Diego River Research Natural Area which would become established when the Record of Decision for the Plan revision is signed. Some habitat would also be managed within Back Country Non-Motorized and Back Country Motorized land use zones. In this alternative, there is a higher level of investment in avoidance and minimization of effects to species-at-risk but provides little focus on the restoration of habitats. More intensive user controls would be designed to minimize user conflicts with sensitive environmental resources.

Under Alternative 3, recommendations to establish two wilderness areas within occupied and potential habitat, and the candidate San Diego River Research Natural Area would all protect occupied habitat. In this alternative, the RNA would become established when the Record of Decision for the Plan Revision is signed. A small portion of habitat would be managed within the Back country Non-Motorized and Back Country land use zones. In this alternative there is a higher level of investment in proactive habitat improvement and surveys, and a stronger focus on habitat restoration compared to avoidance of habitat degradation. There is a higher level of investment in maximum visitor capacity controls which could lead to increased protection of occurrences in the San Diego River area.

Under Alternative 4, most of the occurrences would be managed within Back Country zoning, increasing the possibility that road construction, road maintenance activities or authorized or unauthorized off road driving could damage or kill plants. There are no Special Area designations recommended in this alternative. This alternative would provide the most emphasis on all types of recreation. In this alternative, there is a higher level of focus on management of recreation growth including monitoring recreation use and its effects and managing use in order to offset effects of uses on other resources such as wildlife and vegetation, emphasizing enforcement, and public education programs.

Under Alternative 4a, the majority of the occurrences would be managed within the Back Country Non-Motorized zone, with some habitat managed within Back Country Motorized Use Restricted and Back County zones. The candidate San Diego River Research Natural Area would not be established at the signing of the Record of Decision for the Plan Revision. A decision on whether to recommend establishment would be made within three years. In this alternative as in Alternative 4, there is a higher level of focus on management of recreation growth including monitoring recreation use and its effects and managing use in order to offset effects of uses on other resources such as wildlife and vegetation, emphasizing enforcement, and public education programs. The difference between alternative 4 and alternative 4a is that 4a would not accommodate as much as the projected recreation demand as in alternative 4 and there would be higher emphasis on dispersed use management.

Under Alternative 5, all of the habitat would be managed within Back Country zoning. Alternative 5 is designed to fully accommodate the projected demand for motorized recreation use. This would increase

the possibilities that habitat would be affected by road construction, maintenance and authorized and unauthorized road use.

Under Alternative 6, recommendations to establish the San Diego River Gorge Wilderness and the candidate San Diego River Research Natural Area would protect occupied habitat. The RNA would become established when the Record of Decision for the Plan Revision is signed.

The emphasis on protecting and enhancing biodiversity under Alternatives 3 and 6 could improve the status of this species by location of occurrences, defining threats, and protecting the occurrences as necessary. The greatest number of occurrences appear to fall in to the Back Country Non-Motorized land use zone under Alternative 6; however, habitat protection within the Cedar Creek area would best occur in Alternative 3, where two Wilderness Areas and the candidate San Diego River Research Natural Area are recommended.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Astragalus oocarpus is presumed stable throughout its montane range (Reiser 1994). However, limited available habitat, recreation impacts to some populations, and lack of protection from development of populations on private land contribute to this species' rare status and may lead to local extirpations in the future. Variations in outcome by alternative for the few occurrences of this species on National Forest System lands are not substantial enough to affect the overall outlook for the species on all lands.

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Personal Communication

Winter, Kirsten, Forest Botanist, USDA Forest Service, Cleveland National Forest [email to Deveree Kopp, Mountaintop District Botanist, San Bernardino National Forest]. 07 October 2003.

Astragalus leucolobus

**Astragalus pachypus var.
jaegeri**

Astragalus pachypus var. jaegeri

Astragalus pachypus E. Greene var. *jaegeri* Munz & McBurney (Jaeger's milk-vetch)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G? T1, S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Astragalus pachypus var. *jaegeri*, Jaeger's milkvetch, is known from the Peninsular and San Jacinto ranges of northern San Diego and southern Riverside counties (Spellenberg 1993). Locations include areas in the vicinity of Vail Lake, Dripping Springs, Aguanga Valley, Warner Springs, Potrero Creek, Temecula valley, Rouse Ridge, and Poppett Flats.

Distribution in the Planning Area

On the national forests of southern California, *Astragalus pachypus* var. *jaegeri* is only known from two locations on the Palomar District, Cleveland National Forest (CNF). These occurrences are represented by a few plants located about 0.5 mile southeast and 1 mile east of the Arroyo Seco drainage and the Forest Service Dripping Springs Fire Station. Occurrences in the San Jacinto Mountains on Rouse Ridge and near Poppet Flat Road may be on or near the San Bernardino National Forest.

Taxonomy and Natural History

Astragalus pachypus var. *jaegeri* is a robust, bushy, herbaceous perennial. Stems have gray, scale-like appressed hairs less than 0.3 mm in length. The stems are erect, 2-8 dm and wiry. The leaves are 2.25-16.5 cm long with 15-25 well-separated, narrow leaflets, 3-34 mm in length. The inflorescence has 4 to 28 well-separated and ascending flowers. Petals are yellow (fresh or dried); the banner is 15-17 mm, recurved to 45°, and the keel is 10.7-15.3 mm. The calyx tube is 3.7-4.3 mm long. The fruit is ascending or spreading 12-18 mm long, 4-8 mm wide, straight or curved, compressed side to side and stiffly leathery when mature (Spellenberg 1993).

Habitat Description

Astragalus pachypus var. *jaegeri* occurs in cismontane woodlands, chaparral, coastal sage scrub, valley and foothill grasslands, and rocky or sandy areas at elevations of 500-750 meters (1640 – 2460 feet) (California Native Plant Society 2001, Spellenberg 1993). It is also associated with coastal/desert ecotones in a mix of shrubs (Reiser 1994). It is known to occur with *Berberis nevini* and *Eriogonum fasciculatum* (Reiser 1994) and is associated with gabbro soils and coastal sedimentary soils (USDA Forest Service 1998). *Astragalus pachypus* var. *jaegeri* is reported to flower from March – May (Abrams 1951) or December – June (California Native Plant Society 2001).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 9 occurrences (California Department of Fish and Game 2002). Seven occurrences are on private lands. Four of the private land occurrences are old records, needing confirmation to determine the status of these occurrences. This includes the one San Diego County collection from 1929 near Warner Springs. The three remaining private land occurrences hold some of the larger populations for this taxon, having 20 to 52 plants (California Department of Fish and Game 2002). The Bureau of Land Management (BLM) has one occurrence with 20 plants. The Cleveland NF has two occurrences with few plants (one of these occurrences is not recorded in CNDDDB)

OCCURRENCE DATA of *Astragalus pachypus* var. *jaegeri* (Jaeger's milkvetch)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
1	U	30 in 1990	1990	VAIL LAKE, TIP OF PENINSULA EXTENDING FROM THE SOUTH SHORE OF THE LAKE. PENINSULA IS FORMER RIDGE SEPARATING TEMECULA CREEK AND KOLB CREEK. LOCALLY COMMON AT THE NORTH END, OCCASIONAL AT OTHER SITES ON PENINSULA.	RIV

2	*	Few	1989	0.5 mile Southeast of Dripping Springs / CNF	RIV
*	*	2	2001	1 mile east of Dripping Springs / CNF	RIV
35359 (UCR)	U	U	1968	San Jacinto Mts., at the base, on Poppet Flats Rd. elev. 2000 ft., Lat: 33 ° 47'N/ Lon:116 ° 54'W (Ziegler/UCR)	RIV
59498 (UCR)	U	U	1989	Vail Lake area, sandstone ridge between Kolb Creek and Temecula Creek, forming peninsula at SW end of Lake. Lat:33 ° 29'N/Lon:116 ° 58.5'W T8S/R1W/S10 (Boyd/UCR)	RIV
3 58485 (UCR)	U	52 in 1989 U	1989	5 KM (3 MI) SOUTHEAST OF BEAUMONT, IN CANYON WEST OF POTRERO CREEK. MAPPED WITHIN THE SE 1/4 OF THE SW 1/4 OF SECTION 26. San Bernardino Mts., hills E. of Beaumont, along Potrero Creek, ½ mi. E. of Old San Jacinto Nuevo Y Potrero land grant elev. 2300, Lat: 33 ° 53'N/Lon.116 ° 56'W (LaRue/UCR)	RIV

4	U	U	1968	EAST OF SAN JACINTO ALONG ROAD TO POPPET FLAT, NEAR CASTILE CANYON.	RIV
5	U	U	1881	TEMECULA CANYON, T08S/R03W	RIV
6	U	U	1936	SAGE. S. BOYD SUGGESTS THAT SAGE COLLECTION MAY OCCUR ALONG HWY 79 BETWEEN SAGE AND DRIPPING SPRINGS (VAIL LAKE) ON SANDSTONE SUBSTRATE.	RIV
7	U	U	1929	WEST OF WARNER HOT SPRINGS, T10S/R03E	SD
8	U	U	1995	BASE OF PENINSULA ON SOUTH SIDE OF VAIL LAKE, ABOUT 0.7 MILE SSE OF SPILLWAY. MAPPED ALONG UPPER SLOPE JUST ENE OF WHERE KOLB CREEK ENTERS VAIL LAKE.	RIV
9	U	20 in 1997	1997	SW OF AGUANGA ON SOUTH SIDE OF AGUANGA VALLEY, ABOUT 1.3 MILES SE OF TEMECULA CREEK AT CONFLUENCE WITH COTTONWOOD CREEK. ON GENTLE SLOPE OF NE-FACING RIDGELINE, ADJACENT TO STEEP SLOPES. MAPPED WITHIN THE SW 1/4 OF THE SE 1/4 OF SECTION 33.	RIV

100780 (UCR)	U	U	1998	San Jacinto Mts., Rouse Hill Rd. on Rouse Ridge, S of Cranston Guard Station, elev. 3000-4000 ft., T5S/R2E/S30 or S31 (Noll/UCR)	RIV
101917 (UCR)	U	U	1941	Peninsular Ranges/ Sonoran Desert Transition, Horse Cyn., off Coyote Cyn. Lat:33 ° 29'N/Lon:116 ° 32.5'W	RIV
95257 (UCR)	U	U	1996	NW Palomar Mts., Agua Tibia Mts., Foothills S of Hwy 79; E of the Dripping Spring Campground; approx. 150m SE of the Helopad at the upper camp sites, elev. 1720 ft., T8S/R1W/S22, Se ¼ of NE ¼ (Banks/UCR)	RIV
109000 (UCR)	U	U	1997	NW Palomar Mts., Agua Tibia Mts., Vail Lake area, N & just S of Hwy 79, the hills E of the Dripping Springs above & W. of Vail Lake Marina Rd., elev. 1560-1800 ft., T8S/R1W/S15 (Banks/UCR)	RIV

- * = an occurrence number has not been assigned
- CNF = Cleveland National Forest
- RIV = Riverside County

Threats

Astragalus pachypus var. *jaegeri* is threatened by development on private lands. The larger occurrences on private land at Vail Lake and Potrero are presumed extant but are threatened by proposed development (Reiser 1994). Only three occurrences are protected from development on federal lands. The BLM occurrence in Aguanga Valley (about 20 plants) and the Cleveland NF occurrence 0.5 miles

southeast of Dripping Springs are presumed stable with no known threats. The Cleveland NF occurrence 1 mile east of Dripping Springs has two plants occurring near an unauthorized trail and is threatened by off highway vehicles crushing the plants. This occurrence is easily accessible from Highway 79, where motorbike activity has been observed on adjacent private and Cleveland National Forest lands. Threats to occurrences in the San Jacinto Mountains on or adjacent to the San Bernardino National Forest are not known.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Astragalus pachypus* var. *jaegeri*:

- Install fencing to prevent unauthorized motor vehicle access to the occurrence near Highway 79.
- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Survey for additional locations in potential habitat.
- Visit the occurrences in the San Jacinto Mountains to see if they occur on NFS lands. If they are located on NFS lands, map, document and propose management as needed.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Minimize earth-movement during fire suppression activities at known locations. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. Use ridgelines or base of mountains for fuel break construction. The use of hand line for fuel break construction is preferred.

Evaluation of Current Situation and Threats on National Forest System Lands

Astragalus pachypus var. *jaegeri* is considered to have moderate to high vulnerability on National Forest System lands. One of the locations on the Cleveland NF is presumed stable, but needs verification of the population status. The other location on the Cleveland NF is threatened by unauthorized motorbike activities. At present, no efforts have made to protect this location from vehicle access. Both locations on Cleveland NF are vulnerable to local extirpation from stochastic events due to the low number of individuals per site. Insufficient knowledge regarding land ownership and potential threats to occurrences in the San Jacinto Mountains increases vulnerability.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	A	C	B	D	A

Astragalus pachypus var. *jaegeri* is a USDA Region 5 Forest Service Sensitive species on the Cleveland and San Bernardino National Forests. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Outcomes are based on the Cleveland National Forest occurrences only since it is not known at this time if the San Jacinto occurrences occur on National Forest System lands. Differences between Alternatives 3, 4a and 6 are based on the alternative emphasis.

Under Alternative 1, the current management and land use zoning is retained. This taxon is not federally listed, and does not benefit from the Southern California Conservation Strategy species protection measures in this alternative. One of the two populations of *Astragalus pachypus* var. *jaegeri* on National Forest System lands is subject to disturbance by unauthorized motorbike activity, which could lead to local extirpation of this occurrence. The extent of the seed bank of this population is unknown, making it difficult to predict whether the population would recover.

Under Alternative 2, the current land use zoning would be retained. In this alternative, there is a higher level of investment in avoidance and minimization of effects to species-at-risk but provides little focus on the restoration of habitats. More intensive user controls would be designed to minimize user conflicts with sensitive environmental resources.

Under Alternative 4, the current land use zoning would be retained. This alternative would provide the most emphasis on all types of recreation. There is a higher level of focus on management of recreation growth including monitoring recreation use and its effects and managing use in order to offset effects of uses on other resources such as wildlife and vegetation, emphasizing enforcement, and public education programs. Developed recreation would receive higher emphasis than dispersed recreation.

Under Alternative 5, the current land use zoning would be retained; however this alternative is designed to fully accommodate the projected demand for motorized recreation use, which could increase motorized recreational use of the area. This in turn could increase effects to habitat caused by road use. It could also increase incidents of unauthorized off-route vehicle travel, a threat that is already occurring within occupied habitat, thereby increasing the risk that portions of the population could be damaged.

Under Alternatives 3, 4a, and 6, the current land use zoning would be retained. The land within the

Dripping Springs Critical Biological zone just south of Dripping Springs Fire Station is potential habitat for this taxon and it may benefit from this zoning in these alternatives (Eliason pers. comm. 2005).

In Alternative 3, there is a higher level of investment in proactive habitat improvement and surveys, and a stronger focus on habitat restoration compared to avoidance of habitat degradation. There is a higher level of investment in maximum visitor capacity controls and modification of existing facilities including a decommissioning of recreation facilities and individual sites that are affecting sensitive resources. In alternative 4a, the emphasis is about the same as alternative 4 however 4a would not accommodate as much of the projected recreation demand as in alternative 4. The higher emphasis on managing dispersed recreation would benefit this taxon. In Alternative 6, there is a higher level of emphasis on low impact recreation, visitor capacity controls, public education and habitat restoration. Under alternatives 3 and 6, emphasis on protection of biodiversity increases the likelihood that fencing would be installed and monitored to protect the occurrence along Highway 79. Recommendations to establish the Cutca Wilderness in Alternatives 2, 3, 4a and 6 are not expected to benefit this taxon as potential for habitat in this location is low (Eliason pers. comm. 2005).

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	B	C	C	D	B

Astragalus pachypus var. *jaegeri* populations are presumed stable in their few occurrences. However, the occurrences on private land are threatened with development, particularly in the Vail Lake and Potrero areas. As a result, this taxon is considered highly vulnerable to extinction throughout its range and has potential for federal listing candidacy (Reiser 1994), due to the small number of occurrences and small population size per occurrence (< 55 per site). Additional information is needed on population status on private lands and for old herbarium collection records, especially those located in the San Jacinto Mountains. Most of the occurrences on private land are targeted for acquisition as preserve land under the Riverside County Multiple Species Habitat Conservation Plan (MSHCP) (Dudek & Associates, Inc. 2003) but because there are so few occurrences known for this species, even if the MSHCP is implemented as proposed, the increased potential for extirpation of the Forest Service occurrence near Highway 79 under Alternative 5 lowers the viability outcome rating under this alternative.

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Astragalus oocarpus

Astragalus tricarinatus

Astragalus tricarinatus

Astragalus tricarinatus A. Gray (Triple-ribbed milk-vetch)

Management Status

Federal: Endangered

California: None

Heritage Rank: G1; S1.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

Acknowledgement: Much of this account was derived from the species account prepared by Andy Sanders for the Bureau of Land Management, West Mojave Plan.

General Distribution

Astragalus tricarinatus is endemic to southern California where it is restricted to the dry slopes and canyons around the head of the Coachella Valley in Riverside and San Bernardino counties (Barneby 1964, Munz 1974, Spellenberg 1993,). It is primarily known from the vicinity of Whitewater Canyon (the type locality) and Dry Morongo Canyon along Hwy. 62.

In April 2004, White and Green collected *Astragalus tricarinatus* from the Whitewater River watershed just west of Waithier Landing at about 3,900 feet elevation (White 2004). This population of over 300 individuals is located on private land owned by the Wildlands Conservancy and is surrounded by established wilderness area managed by the San Bernardino National Forest and the Bureau of Land Management (White 2004).

There are also scattered occurrences farther east in the Little San Bernardino Mountains, including an anomalous, relatively high elevation site at Key's Ranch in Joshua Tree National Park. *Astragalus tricarinatus* has also been collected in the Martinez Canyon area in the Santa Rosa Mountains on the southwestern side of Coachella Valley. This collection suggests the possibility that this plant also occurs in the rugged canyons of the San Jacinto and Santa Rosa Mountains between Whitewater Canyon and Martinez Canyon. However, extensive botanical surveys of the Deep Canyon watershed above Palm Desert in the Santa Rosa Mountains have not revealed any new occurrences (Zabriskie 1979).

Distribution in the Planning Area

There are no known occurrences of *Astragalus tricarinatus* on National Forest System lands. All known occurrences of *Astragalus tricarinatus* are downstream of San Bernardino National Forest.

Approximately 462 acres (187 hectares) of potential habitat (as determined through habitat modeling) are present in Snow Canyon, Blaisdell Canyon, and Chino Canyon in the San Jacinto Range (USDA Forest Service 2000, U.S. Fish and Wildlife Service 2001).

Taxonomy and Natural History

Astragalus tricarinatus is a dicotyledon in the legume family (Fabaceae). This short-lived, loosely-tufted perennial grows to 10 inches (25 centimeters) tall and flowers February–May (California Native Plant Society 2001, Spellenberg 1993). *Astragalus tricarinatus* is a somewhat bushy herb, generally described as a perennial, but apparently more commonly behaving as an annual. At best, it is a short-lived perennial persisting for about 3-5 years. The plant is named for its distinctly three-ribbed fruits. Population size fluctuates greatly from year to year in response to timing and amount of rainfall, and in drought years the plant may not appear above ground. Persistence of *Astragalus tricarinatus* through drought periods may depend on a long-lived seed-bank. (U.S. Fish and Wildlife Service 1998)

Mature plants are usually 30-50 cm tall and the stems are erect or ascending. The leaves are ca. 15-20 cm long and are markedly bicolored with the lower leaflet surfaces green and the upper surfaces distinctly whitened by dense, flattened, appressed hairs ca. 0.3 mm long. The leaflets are quickly deciduous, but the petioles and rachis are persistent on the plant.

The erect racemose inflorescence bears 10-15 widely spaced flowers, which are light yellow and dry to a light brown. Based on specimen records, the species flowers from 12 Feb. through 6 April.

Fruits appear as early as mid-March and are present until at least early May. The pods are sharply triangular in cross section, and seem tardily dehiscent. The pod is similar to that of Morongo milkvetch (*A. bernardinus*) which occurs in the same general region, but apparently not in the same habitats.

Astragalus tricarinatus appears to be most closely related to *A. bernardinus*, the only other member of Subsect. Tricarinati (Barneby 1964), but has been confused (based only on flower similarity) with *A. pachypus* Greene. Pollinators, germination requirements, seed longevity, and most other aspects of the biology of this species are unknown.

Habitat Description

Astragalus tricarinatus grows on weathered granite or gravelly soils in Joshua tree woodland and Sonoran desert scrub at elevations of 1,480–4,600 feet (450–830 meters) (California Native Plant Society 2001, California Natural Diversity Database 2002). Plants were most commonly found along

washes in canyon bottoms and on the alluvial fans below, or as small populations or solitary individuals on weathered granite slopes in canyons.

Until the 2004 discovery on the Wildlands Conservancy land, it appeared that no well-established permanent population of any size had ever been found. All of the known populations appeared marginal or transitory. The largest population recorded was a transitory one on the bottom of Big Morongo Canyon. This population numbered ca. 120 individuals in 1991 but had declined to a more normal population size of 6-8 individuals by 1997 (Helmkamp, pers. comm.). The 2004 Wildlands Conservancy population contains ca. 300 plants, more than had been censused at any previously known occurrence (White 2004). In addition, plants were also observed at other similar outcrops in the same vicinity. White suggests that the discovery at this site supports the view of other botanists such as Sanders, that this taxon "has previously been known only from "waifs" washed downstream or downslope from populations on hillsides or higher up in canyons." It also provides a model substrate type for future surveys of this taxon. Associated species at this site include: *Ceanothus greggii*, *Eriogonum fasciculatum*, *Stipa coronata*, *Dendromecon rigida*, *Arctostaphylos glauca*, *Condalia globosa* and *Yucca schidigera* (White 2004).

The species appears to require open soil and is somewhat tolerant of soil disturbance. It may benefit from the open loose soils left by flooding or mechanical disturbance. "Previous collections have been from sandy and gravelly soils in dry washes, at the bases of canyon slopes, and (less commonly) on steep scree slopes of decomposed granite" (White 2004). As stated above it may be that this is simply the place that people collect, and hence find waifs. Given the small size of most populations and the instability of the habitats occupied, it has been difficult to see how this species has maintained itself if washes truly are its main habitat. With every flood, seeds and plants would have been destroyed or washed downstream out of the habitat area. Unless there was a substantial population, part of which would escape destruction, or a permanent population in areas not subject to scouring, it has been difficult to see how a scarce fugitive could maintain population viability at all. There is a need to investigate seed longevity to determine if seeds are able to survive prolonged burial in sand following a flood so that they might wait for many years until another flood again exposes them and makes open habitat available.

There is a great need for careful and thorough surveys of the slopes above the washes where *Astragalus tricarinatus* is usually found. Locations of additional populations would help to conclude that this taxon may not be a wash inhabitant. If there are as-yet undiscovered source populations, it is possible they occur in the watersheds above recorded localities, which could well be on the SBNF.

Occurrence Status

Astragalus tricarinatus is distributed in highly restricted occurrences (California Native Plant Society 2001). When the proposed listing rule was published in 1992, no live plants were known, but a viable soil seed bank was presumed to exist and the species was expected to reappear when climatic conditions became favorable. Most occurrences are concentrated in the Big Morongo Canyon area. Three

occurrences are protected by the Bureau of Land Management in an Area of Critical Environmental Concern, which also managed as a preserve jointly with The Nature Conservancy; however, plants have not been seen at these sites since 1987. Another occurrence is on property owned by The Nature Conservancy at Mission Creek. (California Natural Diversity Database 2004; Sanders 2002). The population on Wildlands Conservancy land has the largest number of individuals and is the most recent discovery of this taxon to date.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Astragalus tricarinatus* (Triple-ribbed milkvetch)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
4	U	1941	Morongo Pass, Morongo Valley. Unknown clumps in desert wash.	RIV/SBD
5	U	1922	Dry Morongo Wash, S of Morongo Valley.	RIV
6	8 in 1986; 0 in 1987	1987	Big Morongo Wash, SSE of former TNC property. BLM-Indio RA.	RIV
8	1 in 1985	1985	Agua Alta Canyon, ca. 1.6 mi. upstream from Martinez Canyon, Santa Rosa Mountains. In gravelly soils of wash. BLM.	RIV

9	2 in 1997	1997	Mission Creek, 0.2 mi. S of SBR/RIV county line, San Bernardino Mtns. Along road towards ranch gate at northern end of TNC property. Sandy, gravelly wash with cobbles, E of the active channel. One plant in the road; the other W of the road in the wash. Cattle grazing, use of road by vehicles. TNC.	RIV
U	300	2004	Whitewater River watershed, just west of Waithier Landing. Landowner: Wildlands Conservancy. Ca. 3,900 ft. elevation (White/Green)	SBD

- *U = Unknown*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *RIV = Riverside County*

Threats

No occurrences of *Astragalus tricarinatus* are known to exist on National Forest System lands. Although potential habitat for the species is present on National Forest System lands, few ongoing land use activities occur in this area, and no adverse effects to this taxon are expected. (U.S. Fish and Wildlife Service (2001). At this time, activities on National Forest System lands are not expected to have direct effects on the Wildlands Conservancy population because adjacent lands are within the established San Gorgonio Wilderness where Forest activities are minimal to none.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Astragalus tricarinatus*:

- Survey all modeled habitat and any new occurrences of *Astragalus tricarinatus*; also watch for source populations in watersheds above known occurrences when doing floristic inventory work; record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Astragalus tricarinatus* to document any new

occurrences on NFS land.

- Map any new occurrences of *Astragalus tricarinatus* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Astragalus tricarinatus is not known to occur on NFS lands at this time, however suitable habitat may be present.

Based on this analysis, *Astragalus tricarinatus* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

Astragalus tricarinatus is listed under the Endangered Species Act of 1973, as amended, as endangered, which assures that any new project proposed on NFS lands in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

No populations of *Astragalus tricarinatus* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Astragalus tricarinatus*.

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**Astragalus pachypus var.
jaegeri**

Atriplex parishii

Atriplex parishii

Atriplex parishii S. Watson (Parish's brittle scale)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G1G2; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-2

General Distribution

Atriplex parishii was historically found in the inland valleys of southern California in Los Angeles, Riverside, San Bernardino, and Orange counties, as well as in Baja California, Mexico (California Native Plant Society 2001, California Natural Diversity Database 2004).

The plant was reported from 11 total occurrences, mostly in the San Jacinto Valley and San Jacinto Mountains in Riverside County. All but two known occurrences are historic, and most of these are presumed extirpated. Historic occurrences at Cushenbury Springs just outside of the northern San Bernardino National Forest boundary and one at Vandeventer Flats in the Santa Rosa Indian Reservation within the San Jacinto District of the SBNF may be extant based on presence of suitable habitat, but have not been observed for many decades. The only occurrences known to be extant are two records in Riverside County near Hemet (Bramlet pers. comm., California Native Plant Society 2001).

Distribution in the Planning Area

There are no known occurrences of *Atriplex parishii* on the San Bernardino National Forest, or in the Province as a whole. However, this species is historically known from two areas adjacent to the San Bernardino National Forest. Suitable habitat has persisted in these areas, and similar alkali habitat occurs nearby these historic localities on NFS lands.

Taxonomy and Natural History

Atriplex parishii is a dicotyledon in the goosefoot family (Chenopodiaceae). It is widely disjunct from closely related taxa that occur in the Central Valley, from which it differs by minor morphological characters (Taylor & Wilken 1993, Welsh 2000). *Atriplex parishii* is an annual herb that blooms June–October (California Native Plant Society 2001).

Atriplex parishii is an annual less than 2 dm tall. Its stems are prostrate to decumbent, generally flexible, white, and scaly to densely woolly near the tips. Leaves are opposite, ovate to cordate, generally densely white-scaly, and have an acute tip. Lower leaves are generally sessile. The pistillate inflorescence contains 2.5-3 mm bracts in fruit that are fused to near the top, are ovate to diamond shaped, are densely tubercled, and entire to few-toothed. Seed are 1-1.5 mm and reddish (Taylor & Wilken 1993).

Habitat Description

Atriplex parishii is found in alkali meadows, vernal pools, playas on drying soils, and in chenopod scrub within desert habitats up to 6,200 feet (1900 m) in elevation (California Native Plant Society 2001, Taylor & Wilken 1993).

Occurrence Status

Atriplex parishii is currently known from only two occurrences. The status of occurrences 4 and 6 are not known.

The following table shows the recorded occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Atriplex parishii* (Parish's brittle scale)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
4	U	1901	Vanderverter's (Vanderverter Flat?) in the San Jacinto Mtns. Land ownership: Santa Rosa Indian Reservation	RIV
6	U	U	Coll. by Parish. Cushenbury Springs. Land ownership: Mitsubishi Cement Company.	SBD

- *U* = Unknown
- *SBD* = San Bernardino County
- *RIV* = Riverside County

Threats

There are no known occurrences of *Atriplex parishii* on National Forest System lands. Therefore, no threats are identified. If this species occurs undetected on the desert slopes of the SBNF, it would be associated with alkali margins with seeps or springs on the lower desert slopes. Such areas are threatened by water developments, including those associated with limestone mining operations.

Conservation and Management Considerations

The priority conservation strategy for this species is to determine the current status of the recorded occurrences adjacent to the SBNF (in cooperation with landowners), and to improve the knowledge of this species' distribution on the Forest by performing focused surveys of suitable habitat. The following is a prioritized list of conservation practices that should be considered for *Atriplex parishii*:

- Survey lower slope seeps and springs on the SBNF for *Atriplex parishii* and associated rare plants. Record occurrence status, habitat condition, and threats. Surveys should include springs in the Smarts Ranch area, across the north slope of the San Bernardinos, and the east slope of the San Jacintos / Santa Rosas (inc. Agua Alta, Cactus, Dos Palmas, and Agua Bonita).
- Collect a herbarium voucher specimen of *Atriplex parishii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in the last ten years.
- Map known and new occurrences of *Atriplex parishii* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Atriplex parishii is a nearly-extinct species that is currently known only to occur in alkali scrub in the Hemet area. Two historic records are near the SBNF, and suitable habitat near these localities exists on the SBNF.

Based on this analysis, *Atriplex parishii* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

Atriplex parishii is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the

development of a biological evaluation at the site-specific level.

No populations of *Atriplex parishii* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Atriplex parishii*.

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Astragalus tricarinatus

**Baccharis plummerae ssp.
glabrata**

Baccharis plummerae ssp. glabrata

Baccharis plummerae A. Gray ssp. *glabrata* Hoover (San Simeon baccharis)

Management Status

Federal: Forest Service Watch List; Bureau of Land Management Sensitive

California: None

Heritage Rank: G3T1 S1.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Baccharis plummerae ssp. *glabrata* is endemic to southern Monterey County and northern San Luis Obispo County from the Los Burros Creek area of Fort Hunter - Liggett south to Arroyo de la Cruz and San Simeon Creek (California Natural Diversity Database 2004, CalFlora 2002). *Baccharis plummerae* ssp. *glabrata* is documented from Fort Hunter Liggett by a specimen collected during the Fort Hunter Liggett floristic survey (Painter 2004).

Distribution in the Planning Area

There are no known occurrences of *Baccharis plummerae* ssp. *glabrata* on National Forest System (NFS) land. Potential habitat for this subspecies is believed to be present in the southern one third of the Monterey Ranger District due to the presence of occupied habitat just to the south and east of the district boundary. There has been no systematic attempt to survey for *Baccharis plummerae* ssp. *glabrata* on the Monterey Ranger District. Using coarse grain GIS queries, there is roughly estimated to be about 500 – 1,000 acres of unsurveyed potential habitat for *Baccharis plummerae* ssp. *glabrata* on NFS land.

Taxonomy and Natural History

Baccharis plummerae ssp. *glabrata* is a dicot in the sunflower family (Asteraceae) and is separated from the more wide spread *Baccharis plummerae* ssp. *plummerae* (Plummer's baccharis) by its linear leaves and glabrous foliage and stems (Hoover 1970). *Baccharis plummerae* ssp. *glabrata* is a dioecious shrub or subshrub that flowers in June.

Habitat Description

Baccharis plummerae ssp. *glabrata* is found in coastal scrub plant communities below 1,575 feet (480 meters) in elevation (California Native Plant Society 2001) on rocky slopes (Matthews 1987) and as a common shrub in windswept areas within open shrub/grasslands (California Natural Diversity Database 2004) and dwarf chaparral dominated by maritime Ceanothus (Keil and McLeod 1987). *Baccharis plummerae* ssp. *glabrata* is also found on cliff faces and bare rock areas of serpentine soil and rock with California buckwheat and Scrub oak (California Natural Diversity Database 2004) and at the interface between coastal sage scrub and grassland (Keil and McLeod 1987).

Occurrence Status

Baccharis plummerae ssp. *glabrata* is known from only from three occurrences. At one location it is considered a common shrub (California Natural Diversity Database 2004). At a second location, ten (1996) to twenty-five (1986) plants have been observed (California Natural Diversity Database 2004); however rugged terrain makes surveying and obtaining accurate counts difficult.

Threats

Narrow endemism and small population size creates vulnerability to stochastic events. No land use-specific or site-specific threats have been identified for *Baccharis plummerae* ssp. *glabrata*.

Conservation and Management Considerations

Surveys on National Forest System (NFS) land on the Monterey Ranger District are needed to determine this taxon's status on NFS land. Protect all occurrences found on NFS land. If present, undetected occurrences may be immune to land use activities due to preference for steep unstable slopes and thick windswept scrub as habitat.

Evaluation of Current Situation and Threats on National Forest System Lands

Baccharis plummerae ssp. *glabrata* is a very narrow endemic known only from three locations in the Santa Lucia Mountains. All three of these locations are off of National Forest System lands. However, because these three occurrences are just south of or just to the east of the Monterey Ranger District, there is a moderately high probability that the species also occurs on the ranger district.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Baccharis plummerae* ssp. *glabrata* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupported assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Baccharis plummerae* ssp. *glabrata*.

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Baccharis vanessae

Baccharis vanessae **Beauch.** (Encinatas baccharis)

Management Status

Federal: Threatened (61 Federal Register [FR] 52370, October 7, 1996)

California: Endangered

Heritage Rank: G1, S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-3-3

There is no proposed or designated Critical Habitat for this species.

General Distribution

Baccharis vanessae is endemic southern coast and foothill regions of San Diego County (Sundberg 1993). It occurs along the coast near the city of Encinitas and extends inland to Iron Mountain and Mount Woodson in the foothills of the northwest Peninsular Ranges (Sundberg 1993, Stephenson and Calcarone 1999). Other locations include Escondido, Margarita Peak, Poway, and Rancho Santa Fe (California Department of Fish and Game 2004).

Distribution in the Planning Area

Baccharis vanessae is only known on the Cleveland National Forest (CNF). *Baccharis vanessae* occurs in one location on the CNF in Devil's Canyon within the San Mateo Wilderness, Trabuco Ranger District.

Taxonomy and Natural History

Baccharis vanessae is a dioecious broom-like shrub less than 2 meters tall, from a root crown. Plants are generally glabrous and sticky. Stem branches are dense, erect, and often without leaves when flowering. Leaves are sessile, 1-45 mm, linear, and entire. Heads are in a raceme or open panicle, or few-headed clusters. Involucre is funnel shaped, 5.5-6.8 mm, with phyllaries in 4 series, narrowly tapered, thick, rounded on the back, generally glandular pubescent. Phyllary tips are acute, long

tapered. Staminate flower heads have 15-22 flowers with 4 mm long corollas. Pistillate flower heads have about 25 flowers with 2.5 mm long corollas (Sundberg 1993). Plants flower from September to November (Beauchamp 1986).

Stump sprouting of plants was observed in a Lake Hodges population following a fire (California Department of Fish and Game 2004, CNDDDB Occ. no. 8).

Habitat Description

Baccharis vanessae occurs in coastal low-growing chaparral on sandstone substrate in steep, open, rocky areas to approximately 2000 feet (609 m) (USDA Forest Service 1998; Stephenson and Calcarone 1999). Occurrences inland may also be associated with southern mixed chaparral (USDI Fish and Wildlife Service 1996). Associated species include *Adenostoma fasciculatum*, *Arctostaphylos glandulosa* ssp. *crassifolia*, *Xylococcus bicolor* and *Yucca schidigera*.

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 24 occurrences for *Baccharis vanessae* (California Department of Fish and Game 2004). Four occurrences are extirpated, two are on locally protected lands (owned by City of Encinitas and San Diego), and 17 are on private lands. Only one of the known occurrences is located on National Forest System lands (Table 1). Twelve plants were identified at this occurrence on the CNF. An estimated total of 2000 individuals are known for this species.

TABLE 1. OCCURRENCE DATA of *Baccharis vanessae* (Encinatus baccharis) on National Forest lands.

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
22	2-1	12	1992	Devil's Canyon, San Mateo Wilderness / CNF	SD

- SD San Diego County
- CNF Cleveland National Forest

Threats

Populations of *Baccharis vanessae* on private lands are threatened by development. Two occurrences are protected on municipal lands. The occurrence on the CNF is isolated within the San Mateo Wilderness with no known threats.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Baccharis vanessae*:

- Monitor all habitat and species occurrences in the Cleveland National Forest.
- Survey modeled habitat.
- Maintain the geographic and genetic diversity of the species by protecting the known population on Federal lands.
- Allow wildland fires to freely burn through the occurrence. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities. The use of hand line for fuel break construction is preferred.

Evaluation of Current Situation and Threats to National Forest System Lands

Baccharis vanessae is considered to have low vulnerability on National Forest System lands due to its remote location within the San Mateo Wilderness. There is little to no risk of extirpation of this occurrence. However, the occurrence in the San Mateo Wilderness is the only National Forest System population and represents the northern periphery of this species' range, separated by 54 km (33 miles) to its nearest neighbor (Boyd and others 1992). No Forest Service activities currently present a threat to this species.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Baccharis vanessae is listed under the Endangered Species Act of 1973, as amended, as threatened, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the U.S. Fish and Wildlife Service at the site-specific level.

The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Baccharis vanessae*. Variations in land use designations would not alter this current situation and the various emphases of the alternatives would not result in a substantial change in conditions for *Baccharis vanessae*. *Baccharis vanessae* would remain distributed in its current geographic range on National Forest System land under

all alternatives.

Viability Outcome for all Land within Range of Taxon

Baccharis vanessae is highly vulnerable to extinction across its range. The majority of occurrences is located on private lands and is threatened by development (California Department of Fish and Game 2004). *Baccharis vanessae* is also vulnerable to local extirpation due to the low number of individuals per occurrence. No occurrences have greater than 300 individuals per site (U.S. Fish and Wildlife Service 1996). Reduced genetic variability in these small populations may make them vulnerable to human or naturally caused catastrophic events, such as drought (U.S. Fish and Wildlife Service 1996). By maintaining the current distribution of *Baccharis vanessae* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Baccharis vanessae* to suffer a decline in its overall distribution.

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**Baccharis plummerae ssp.
glabrata**

Berberis nevinii

Berberis nevinii

Berberis nevinii A. Gray (Nevin's barberry)

Management Status

Federal: Endangered (63 FR 54956-54971, 13 October 1998)

California: Endangered

Heritage Rank: G2; S2.2 (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

There is no Critical Habitat designated or proposed for this species.

General Distribution

Berberis nevinii is known from Los Angeles, San Bernardino, and Riverside counties (California Native Plant Society 2001, California Natural Diversity Database 2002a). Its current range extends from the foothills of the San Gabriel Mountains to the foothills of the Santa Ana Mountains and the Palomar Mountains (USDA Forest Service 2003). *Berberis nevinii* is known from fewer than 30 scattered natural occurrences and several sites where it has been introduced via horticultural plantings. There are 500–1,000 plants estimated to occur at all known sites (USDI Fish and Wildlife Service 1998). There is some uncertainty over which occurrences are native versus introduced, as this species has been cultivated for many years.

Distribution in the Planning Area

The largest known occurrence of *Berberis nevinii*, which contains approximately 200 plants, is in the Vail Lake-Oak Mountain area, including 7 acres of the Cleveland National Forest, near the Agua Tibia Wilderness Area (USDI Fish and Wildlife Service 2001). Two other occurrences are on 138 acres (56 hectares) in San Francisquito and Lopez canyons on the Angeles National Forest (USDI Fish and Wildlife Service 2001). The San Francisquito Canyon occurrence is estimated to contain 130–250 plants, but the Lopez Canyon population is known from only one plant. There is a historical occurrence reported from the San Bernardino National Forest. Potential habitat exists at this site, but there have been no recent sightings. This historical occurrence is suspected to have been planted because it was at a higher elevation than any other known occurrences, and there was historically a California

Conservation Corps nursery nearby. Surveys of potential habitat on the Angeles, Cleveland, and San Bernardino national forests have been conducted, but new occurrences have not been found (Mistretta 1989). Additional surveys are scheduled for the 2005 field season on the San Bernardino National Forest in areas burned in the 2003 Grand Prix and Old Fires.

Taxonomy and Natural History

Berberis nevinii is a dicotyledon in the barberry family (Berberidaceae). The genus *Berberis* includes two subgenera: *Mahonia* and *Berberis*. These two subgenera are separated on characters such as spineless vs. spiny stems and compound vs. simple leaves. *Berberis nevinii* was traditionally included in the subgenus *Mahonia*.

Berberis nevinii is an evergreen rhizomatous shrub that blooms March–April (California Native Plant Society 2001, USDI Fish and Wildlife Service 2001). It grows from 3–12 feet (1–4 meters) tall and may have a life span of more than 50 years. The species naturally occurs in small populations and appears to have naturally low rates of regeneration due to sporadic viable seed production (Winter 1998). *Berberis nevinii* is susceptible to infection by a rust, *Puccinia graminis* (Whittemore 1997).

Berberis nevinii has erect 1-4 m stems. The bud bracts are generally deciduous. The leaves are 3.5-7 (12) cm and cauline or crowded on short, lateral stems. The petiole is generally 0.5-2 cm. There are generally 3-5 leaflets that are 2.5-4 cm, 1.2-2 cm wide, narrowly elliptic to lanceolate, flat to wavy, have a base that is more or less obtuse, have an acute to acuminate tip, and are serrate with 8-10 spine tipped teeth, and has 1 mm tips. The inflorescence is 3.5-6.5 cm and open. The axis internodes are 5-10 mm in flower, and there are 3-5 flowers. The fruit are 5-8 mm in diameter, spheric, and reddish. The seeds are 3.5-4 mm. (Hickman 1993).

Berberis nevinii is a cane shrub that has been observed to resprout vigorously after light to moderate-intensity fire. Its germination response to fire and resprouting responses to higher intensity fire are not known.

Habitat Description

Berberis nevinii plants are found as discrete, localized occurrences in two types of habitat: sandy and gravelly places along the margins of dry washes, and coarse soils in chaparral, at elevations of 900–2,000 feet (300–650 meters) (USDI Fish and Wildlife Service 1998). At Vail Lake, *Berberis nevinii* occurs with low-growing chaparral shrubs and may tower above them (Reiser 1994).

Chaparral is the dominant ecological community in cismontane, lower montane and foothill areas on the four southern California national forests at elevations below 5,000 feet (1,524 meters). In general, chaparral is an abundant plant community and is well represented on public lands. It is not well understood why this species is so rare when its apparent habitat association is so common. Changes in land use and the fire regime (fire intensity, magnitude, and frequency) are the most important factors

influencing ecological processes in chaparral habitats. As with other habitats in wildland-urban interface areas, land development has resulted in habitat fragmentation, loss, and degradation for many wildlife species (California Partners in Flight 2000). Development has also created fire management problems because of increased ignition sources and difficulties conducting landscape-level fuel management practices.

Occurrence Status

At least seven historic occurrences are known to have been extirpated, probably due to factors associated with urban development (USDI Fish and Wildlife Service 1998). The remaining occurrences, although few in number, are relatively stable (Reiser 1994). *Berberis nevinii* is always likely to be rare due to its habitat limitations and lack of protection on private lands (Winter 1998).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Berberis nevinii* (Nevin's barberry)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
2	3 in 1976, 1 in 1987	1989	Dripping Springs, W of Aguanga. Mapped on S side of road to Vail Lake just W of campground, ca. 300 m NW of Dripping Springs. w/ <i>Quercus agrifolia</i> , <i>Salix laevigata</i> , <i>Populus fremontii</i> , <i>Haplopappus pinifolius</i> , <i>Artemisia dracuncululus</i> , <i>Platanus racemosa</i> , forbs, grasses. Near population of <i>Dodecahema leptoceras</i> . PVT recreational uses associated w/ campground could threaten occ. A great deal of vegetation has been removed for the present campground.	RIV

4	5 in 1982, 2 in 1985, 7 in 1987	1987	Side canyon of San Timoteo Canyon (S of Redlands). Associated w/ <i>Lepidospartum squamatum</i> , <i>Prunus ilicifolia</i> . Plants on banks of ephemeral stream channel bottom of floodplain. Good plant diversity, but only fair quality. Damaged by ORVs and horseback riding. PVT.	SBD
5	1	199U	Near mouth of Scott Canyon, SW of Redlands. City of Loma Linda? w/ <i>Eriogonum fasciculatum</i> , <i>Rhamnus crocea</i> , <i>Prunus ilicifolia</i> , <i>Artemisia californica</i> . On steep bank of an ephemeral stream in a narrow canyon. In powerline right-of-way and nearby powerline access road. Predominance of annual grasses threaten occ. Site has been overgrazed in the past. Plant was burned recently by a fire; impact unknown.	SBD
6	U	1932	San Fernando Valley, Van Nuys Blvd. 2 blocks E of Pacoima School. In sandy gravel. Many old collections. Area visited in 1999, but no habitat remains. PVT.	LA

7	U	1937, 1999	San Fernando Wash (Pacoima Wash). This wash is now channelized. Lower Sonoran zone. Dry wash w/ <i>Rhus laurina</i> , <i>Eriodictyon crassifolia</i> . Location vague. Numerous historical collections, incl. topotypes. Not seen recently.	LA
8	U	1961	Arroyo Seco, South Pasadena; 1 mile N of Pasadena Freeway. Land owner: U.	LA
9	U	1927	Devils Gate in Arroyo Seco, Pasadena. Halfway between Devils Gate and the mountains, Arroyo Seco. Needs fieldwork. Land owner: U.	LA
10	U	1904	Big Tejunga (Tejunga) Wash, near San Fernando. Needs fieldwork. Land owner: U.	LA
11	75 (seedlings) in 1986, 130+ in 1987, 200 in 1988	1988	San Francisquito Canyon, on both sides of Hwy, below Powerhouse #2, N of Saugus. On rocky, gravelly cliffs and wash bottom in chaparral w/ coast live oak, black sage. Mostly in NW facing slopes. W and S of the Forest Service fire station. Dumpings, invasion by tamarisk are threats. <i>Berberis</i> planted here in 1929 by Payne and may have naturalized at this site. ANF.	LA

12	U	1965	San Francisquito Canyon, near confluence w/ Santa Clara River. Unknown area now has a nursery under power lines, crops in floodplain, and is a popular ORV area. Erosion also threatens. Some plants found 'near the confluence w/ Santa Clara River.' Seen in 1965, but not in 1987.	LA
13	5 in 1976, 1987; U in 1999	1999	E bank of Arroyo Seco, 0.5 mi. N of Rose Bowl, corner of Arroyo and Washington streets. Some plants being overgrown by associated species. w/ Toyon and oaks. Adj. to road. Occ. in natural area adj. to golf course and housing.	LA
14	U	1927	Aguana. Exact location U. There is a 'great possibility that Jaeger collected specimen at Dripping Springs or what is now Vail Lake.'	RIV
16	U	1989	N end of Vail Lake, just W of Vail Lake Dam; S side of Temecula Creek ca. 2 mi. N of Dripping Springs. Development could threaten occ.	RIV

17	20	1987	On County Rd. #S6, 1.6 mi. N of its JCT w/ HWY 76, SW of Palomar Mountain. Surrounded by chaparral. Row-like appearance of population suggests these plants were planted here. Occurrence is doing well and reproducing.	SD
18	6	1976	W-facing slope Rim Arroyo Seco, near corner of Arroyo Blvd. & Washington Blvd, Pasadena. PVT. On rocky alluvial soil w/ <i>Rhus integrifolia</i> .	LA
19	1	1985	ca. 0.5 mi. N of San Francisquito Powerhouse, San Francisquito Cyn. On alluvial terrace w/ <i>Eriodictyon</i> sp., <i>Prunus ilicifolia</i> , <i>Yucca</i> . New highway construction by LAX road department proposed and flagging nearby. Good habitat, but only 1 plant. Payne planted this spp. in vicinity in 1945. ANF.	LA
20	1 in 1987, 1989	1989	W side of Arroyo Seco Creek, ca. 0.3 mi. NW of Dripping Springs Guard Station, N of Hwy 71. Disturbances incl. brush clearing, weeds, etc. Plant on edge of sandy alluvial area near high water mark. Outside chain link fence of private RV park. One plant only, but a very large specimen w/ a substantial burl. PVT.	RIV

21	30-40	1986	<p>Below Water Tower #113, Vista Del Valle Rd., Griffith Park, Santa Monica Mtns. Threatened by foot traffic, fire, exotic species. N slope of chaparral on Santa Monica Mountains soil. w/ <i>Eriogonum</i>, <i>Rhus</i>, <i>Quercus agrifolia</i>, <i>Eucalyptus</i>. Probably planted during the 1930's/1940's. Commonly planted after fire acc. to park horticultural staff. City of LA.</p>	LA
22	U	1987	<p>S of Temecula Creek, E of JCT of Pauba Valley and Wolf Valley, ca. 3 mi. SE of Temecula. Housing development to destroy portion of occ. One plant on S margin of creek at base of cliff on a mule fat/willow riparian scrub plant community. 1 plant in garden of old ranch house. Portion of occ. will be preserved in open space.</p>	RIV
23	U	1987	<p>On N side of Hwy 18, between Arrowhead highlands and Rimforest. Specimen collected here. Years later site was visited and road widening had extirpated occ. May have been originally a planted occ. or an escapee from cultivation. SBNF.</p>	SBD

24	134 in 1987	1989	S and SW side of Vail Lake, from W side of Kolb Creek E to boat ramp. PVT owner (1) may subdivide. Equestrian trail, dirt road in wash, rising lake level, weedy plants (tamarisk and others). In canyons and on ridges. Soil type is gullied land type also sandy loam. w/ <i>Artemisia californica</i> , <i>Adenostoma fasciculata</i> , <i>Eriogonum fasciculatum</i> . Numerous colonies mapped just above high water line on topo. Incl. colonies along both sides of SW arm of lake, along the S shore and peninsula, and a portion of the W shore of the SE arm. Fire has gone through wash area of occ. but plants stump-sprouted and are fine. Incl. former occs. 1, 25. PVT.	RIV
26	5	1989	Dripping Springs Campground Guard Station, S of Vail Lake along Hwy 79. Trampling from foot traffic. These plants were planted here at unknown date (not a natural occ.) Plants are outside of men's restroom. CNF.	RIV
27	1	1991	S side of Hwy 79 S of Vail Lake, immediately W of USFS Dripping Springs Campground. Land owner: U.	RIV

28	2	1989	<p>NE side of Vail Lake, ca. 0.7-1 mi. E of dam. In drainage bottom w/ <i>Adenostoma fasciculatum</i>, <i>Rhus ovata</i>, <i>Quercus berberidifolia</i>, <i>Bromus rubens</i>, <i>Ceanothus crassifolius</i>, <i>Rhamnus crocea</i>, <i>Haplopappus palmeri</i>, <i>Eriastrum sapphirinum</i>, <i>Schismus barbatus</i>, <i>Eriogonum fasciculatum</i>. Site is in along drainages above the highwater line of the lake. Mapped ca. 0.8-1.3 mi. N of boat ramp. Potential reservoir site. PVT.</p>	RIV
29	U	1987	<p>NW side of Vail Lake, ca. 0.7 mi. W of dam. SW side of Temecula Creek above major bend in creek; ca. 2.4 mi. NNW of Dripping Springs Guard Station. Land owner: U.</p>	RIV
30	< 5 in 1980's	198U	<p>Vicinity of San Antonio Wash; a few miles W of the town of Upland and just N of Claremont. Just W of Padua Ave. Site to be developed acc. to Fish & Wildlife Service staff. PVT?</p>	LA

31	5 in 1989	1989	<p>Just S of Butterfield Valley and Hwy 79, ca. 1.0 mi. E of Dripping Springs Guard Station. Gullied land. At edge of stream channel in chaparral w/ <i>Quercus berberdifolia</i>, <i>Lonicera subspicata</i>, <i>Adenostoma fasciculatum</i>, <i>Elymus condensatus</i>, <i>Haplopappus squarrosus</i>, <i>Toxicodendron diversilobum</i>, <i>Yucca schidigera</i>. Adj. to <i>Quercus agrifolia</i>. Mapped ca. 0.2 mi. S of hwy along canyon S of entrance road to Vail Lake. CNF.</p>	RIV
32	3 in one subpop. in 1989	1989	<p>E of Vail Lake on E side of Butterfield Valley, ca. 0.5 mi. N of Hwy 79, N and E of Temecula Creek. Development and grazing could threaten site. On bank adj. to dry wash in fine, sandy soil. Mixed chaparral w/ <i>Rhamnus crocea</i>, <i>Eriogonum fasciculatum</i>, <i>Rhus ovata</i>, <i>Adenostoma fasciculatum</i>, <i>Lonicera subspicata</i>. Mapped as 2 small subpopulations. PVT potential reservoir site.</p>	RIV

33	1 in 1989	1989	E of Vail Lake on E side of Butterfield Valley, ca. 0.8 mi. N of Hwy 79. Potential reservoir site, evidence of past grazing. Mixed chaparral on gentle W-facing slope S of main east-west oriented canyon. In sandy/rocky soil. w/ <i>Salvia mellifera</i> , <i>Adenostoma fasciculatum</i> , <i>Rhamnus crocea</i> . PVT.	RIV
34	1	1989	SE of Vail Lake along road on W side of Butterfield Valley, ca. 0.4 mi. N of Hwy 79. N-facing slope in Hanford coarse sandy loam soil w/ <i>Artemisia tridentata</i> , <i>Rhamnus crocea</i> , <i>Keckiella antirrhinoides</i> , <i>Salvia mellifera</i> , <i>Quercus agrifolia</i> . Mapped on lower slopes along W side of road. Plant found w/in a fenced area. PVT area used as a recreational site.	RIV
35	7	1989	N side of Vail Lake, ca. 0.35 mi. NE of dam. In sandy, gravelly soil in bottom of drainage. Mapped along canyon just above highwater line on topo. w/ <i>Arctostaphylos glauca</i> , <i>Adenostoma fasciculatum</i> , <i>Rhus integrifolia</i> , <i>Juniperus californica</i> , <i>Rhamnus crocea</i> . Just S of a large grove of <i>Prosopis glandulosa</i> . Proposed reservoir site. PVT.	RIV

36	17	1989	N side of Vail Lake, S-facing slopes of 'Big' Oak Mountain, 0.5-1.1 mi. due S of VABM 2706' on topo. Proposed reservoir site. S-facing drainage bottoms in chaparral and Riversidean sage communities. w/ <i>Adenostoma fasciculatum</i> , <i>Arctostaphylos glauca</i> , <i>Artemisia californica</i> , <i>Brickellia californica</i> . Very near an occ. of <i>Harpagonella palmeri palmeri</i> . Mapped as 4 small subpopulations. PVT.	RIV
37	1 in 1989	1989	S-facing slopes of 'Big' Oak Mtn., 0.5 mi. SE of VABM 2706' on topo. PVT development.	RIV
38	1	1989	'Big' Oak Mtn. summit at VABM 2706' on topo. PVT development.	RIV
40	U	199U	S of Redlands; 2.3 airmi. SW of McKinley School. Just off of Pilgrim Rd. Under the powerlines. Large, apparently clonal ring. Land owner: U.	SBD
41	15-20	1995	SW of Vail Lake along drainage to Kolb Creek, ca. 0.5 mi. NW of Dripping Springs. Mapped near where trail meets dirt road N of road to Vail Lake.	RIV

43	1 in 1997-2001	2000	W side of Lopez Canyon, 0.9 mi. upstream from confluence w/ Indian Canyon N of Forester Haven and San Fernando. W side of paved road, 1.5 mi. from JCT w/ Paxton. In alluvial scrub w/ <i>Artemisia californica</i> , <i>Quercus agrifolia</i> , <i>Prunus ilicifolia</i> , <i>Sambucus mexicana</i> covered by <i>Marah microcarpus</i> . Adj. to <i>Ribes aureum</i> . Other associates incl. <i>Acourtia microcephala</i> and <i>Camissonia</i> . Prone to occasional trash dumping. ANF.	LA
45	U	U	In desert foothills of Anza-Borrego near Ranchita. Needs fieldwork. DPR-Torrey Pines SR.	SD
*	U	1903	Wash near Garnsey, San Fernando Valley (Grinnel/UC/Jeps)	LA
*	U	2000	Griffith Park at Water Tank 113, N of Mt. Hollywood, Del Valle Drive. Santa Monica Mts. Plants apparently planted and naturalizing. (Soza, Wallace and others/RSA)	LA
*	U	1994	Balboa Park, cultivated (RSA)	SD
*	U	1948	El Monte Library. Cultivated (RSA)	LA

*	U	1936	Occidental College Campus, Eagle Rock. cultivated	LA
114828 (UCR)	1	1998	Jurupa Mts. Cultural Center, Jurupa Mts, Fontana, ¼ mi. SE of peak 1411. Tree in garden. T2S/R5W/S7 (Provance/UCR)	RIV
9332 (UCR)	U	1969	University of California, Riverside. Cultivated (Austin/UCR)	RIV
110099 (UCR)	1	1998	Lopez Canyon, N. of San Fernando. Angeles National Forest. San Gabriel Mts. (Wallace, Eliason/UCR)	LA
35179 (UCR)	U	1977	Vail Lake, hills on S. side of lake. (Ziegler/UCR)	RIV
*	1	1997	Southern base of mts, upper western edge of alluvial fan spilling from mouth of San Antonio Canyon and just S. of Mt. Baldy Rd, W of Padua Ave., Old nursery nearby, presumed adventive (Boyd/UCR)	LA
14451 (UCR)	U	1974	Approx. 1¼ mile NW of point where Edison power lines cross Redlands Blvd. In San Timoteo Canyon near Redlands, CA (Derby/UCR)	SBD
51358 (UCR)	U	1988	Tonan property, along Temecula Cr. On Old Vail Ranch, E. of Temecula. Native (LePre/UCR)	RIV

*	1	1999	Cobal Canyon, Marshall Canyon Regional Park, Claremont. Aprox. 1 mi south of ANF boundary. (RSA)	LA
23384 (UCR)	U	1955	Scott's Cyn., 2 mi. SE of Loma Linda, Lat:34 ° 02'N/ Lon:117 ° 16'W (Roos/UCR)	
50867 (UCR)	U	1989	Vail Lake area, sandstone ridge between Kolb Creek and Temecula Creek, forming peninsula at SW end of Lake, T8S/R1W/S10, (Boyd/UCR)	RIV
67353 (UCR)	U	1990	Vail Lake area, E. flank of Oak Mt. Just S of E summit, elev. 2000-2300 ft., T8S/R1W/S3 (Boyd/UCR)	RIV
56998 (UCR)	U	1988	Redlands area, Pilgrim Rd. (0.2 mi. W of the dump), 0.9 mi. above San Timoteo Cyn. Rd., just N of the power lines (Sanders/UCR)	
51897 (UCR)	U	1988	San Timoteo Cyn., S of San Timoteo Cyn. Rd. ca. 1.5 mi. E of RR crossing. Accessible by power line service Rd. between horse ranch and dairy farm, T2S/R3W/S9, elev. 1540-1680 ft. (Phillips/UCR)	

95360 (UCR)	U	1996	NW Palomar Mts., Agua Tibia Mts., Foothills S of Hwy 9, E of Dripping Springs Campground, Approximately 2.1 km E. of Dripping Springs Guard Station, S of the jct. Between Vail Lake Marina Rd. and Hwy79, just S of Cleveland Nat'l Forest, T8S/R1W/S23 (Banks/UCR)	RIV
99504 (UCR)	U	1997	San Gabriel Mts., southern base of the Mts., upper western edge of the alluvial fan spilling from the mouth of San Antonio Cyn., just S of Mt. Baldy Rd. and W. of Padua Ave., elev. 1780 ft. TN/R8W/S27, NE ¼ of SE ¼ of NE ¼ (Boyd/UCR)	
113891 (UCR)	U	1999	Granitic knoll ca. 0.1 mi. SW of Victoria Hill (pk 1005), W of the corner of Ivy St. and Victoria Ave., elev. 1020 ft., T2S/R5W/S35 (Provance/UCR)	RIV
149339 (UCR)	U	1998	San Gabriel Mts., Claremont Hills Wilderness Park, 0.2 to 0.6 mi. (by Rd.) NNW of N terminous of Mills Ave., on Cobal Cyn. Rd., elev. 1780 ft., T1N/R8W/S27 center (Swinney/UCR)	LA

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *CNF = Cleveland National Forest*

- *SBD* = San Bernardino County
- *LA* = Los Angeles County
- *RIV* = Riverside County
- *SD* = San Diego County

Threats

Two occurrences on 138 acres in San Francisquito and Lopez Canyons on the ANF remain extant. The San Francisquito Canyon occurrence is estimated to contain 130-150 plants and is well protected by fencing and oversight by personnel working at the fire station. The Lopez Canyon population consists of only one plant and it continues to be threatened by wildfire, fire suppression activities, and illegal trash dumping. Small population sizes and poor knowledge add to the severity of these threats. The 7 acres of occupied habitat on the Cleveland National Forest, near the Agua Tibia Wilderness Area remain extant. This population due to its proximity to State Highway 79 may be affected by unauthorized off road driving and shooting, and fire starts. The historical occurrence reported from the San Bernardino National Forest has not been relocated, however the site remains suitable.

Appropriate fire management may be necessary for the long-term survival of *Berberis nevini*. The Cleveland National Forest population was burned in a wildfire in 1996 and responded with vigorous recruitment from resprouting and seeding (USDA Forest Service 2000). Infrequent burns may result in fuel build-ups and hot fires that may result in the loss of individuals. However, fires occurring too frequently in an area can burn young or resprouting shrubs before they become reproductively mature and may lead to seed bank depletion, resulting in habitat conversion to non-native grasses (Zedler and others 1983; Malanson and O'Leary 1985).

Conservation and Management Considerations

Berberis nevini is included in a conservation strategy for coastal sage scrub (USDA Forest Service, USDI Fish and Wildlife Service, and California Department of Fish and Game 1997), and the Angeles National Forest has developed a species management guide for occurrences on the forest (Mistretta and Brown 1989). The primary conservation strategy for *Berberis nevini* is to implement these management guides, protect occupied habitat from present threats, and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Implement the management guide referenced above.
- Implement the conservation strategy for coastal sage scrub referenced above.
- When finalized, utilize the habitat suitability criteria being developed by the southern California Forests with the US Fish and Wildlife Service. (The habitat description developed by Rancho Santa Ana botanists was sent by the southern California Forests to the USFWS in 2004). This will ensure that future projects and management actions with effects to any threatened or endangered species will trigger the appropriate standards, even where occurrences are currently not known.

- Install fencing or other protective measures as needed to protect occupied habitat from present threats.
- Perform focused surveys for this species in suitable habitat 3-5 years post fire (wildfire or prescribed) where possible.
- Apply the habitat suitability criteria and detection protocol developed for this taxon to surveys at the project level.
- For NFS lands, survey all new occurrences of *Berberis nevinii* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Berberis nevinii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Berberis nevinii* in the Province using established data collection standards, and incorporate these occurrences into the NRIS Rare Plant Module.

Evaluation of Current Situation and Risks on National Forest System Lands

Berberis nevinii is a rare species known only to occur in the cismontane foothills of southern California. While its chaparral habitat is very common, occupied habitat is widely scattered, and occurrences often consist of very few individuals. Because of the elevational range of *Berberis nevinii*, occurrences on NFS land are generally peripheral to lower elevation habitat on private land. Most occurrences are not well protected from identified threats.

Based on the above analysis, *Berberis nevinii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	C	A

Berberis nevinii is listed under the Endangered Species Act of 1973, as amended, as endangered, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

The viability of this species is largely tied to localized protection and management of occupied habitat,

and generalized fuels and vegetation management of the low-elevation chaparral belt. Existing protections afforded this species under the Endangered Species Act provide considerable baseline protection. With implementation of the Coastal Sage Habitat and species management guide, viability for this species on NFS lands is improved.

Fire and fuels management, and the risks associated with wildfire suppression are expected to be equivalent across all alternatives, and protection for this species is virtually the same across all alternatives with the following exceptions. Under alternatives 2,3,4, 4a, and 6 there would be 50 acres (the San Francisquito occurrence suspected to be cultivars) of the 191 acres of occupied habitat on all NFS lands managed within the San Francisquito Canyon Critical Biological zone on the Angeles National Forest.

Besides the Critical Biological zoning described in the alternatives above, the only substantial differences for this species across alternatives is the management emphasis on conservation, with associated protection and monitoring, impact identification, and response time. In this sense Alternative 5 is least protective, 1, 2, 4, 4a provide moderate protection, and 3 and 6 provide most protection. There is recognition that the Critical Biological Zone is important in Alternatives 2 and 4a, however it's presence is not enough to meet the A predicted outcome criteria.

Consideration of the Suitable Use restricting motorized vehicle travel to designated Forest Transportation System roads and trails, along with Standards related to surveys, fire and fuels management, and recreation management factor in to these outcomes. Presumed implementation of strategies listed in the above referenced Management Guides is key to these outcomes.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

The habitat for *Berberis neviii* on private lands across cismontane southern California have been extensively reduced and fragmented by residential and commercial development. Additional losses have resulted from road construction and flood control projects. The habitat for this species on NFS land is a relatively minor portion of this species' distribution, and much of what is left on private lands is at grave risk of ongoing habitat loss and degradation. This loss may reduce the viability of the protected and managed occurrences on NFS lands by substantially increasing the fragmentation and separation between protected occurrences and reducing the overall populations to very low numbers of individuals that may be susceptible to genetic risks.

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Baccharis vanessae

Bloomeria humilis

Bloomeria humilis

Bloomeria humilis Hoover (Dwarf goldenstar)

Management Status

Federal: Forest Service Watch List; Bureau of Land Management Sensitive

California: Rare

Heritage Rank: G1, S1.1 – very threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Bloomeria humilis is endemic to northwestern San Luis Obispo County and is found at only two locations -- the Arroyo de la Cruz area and San Simeon Creek (CalFlora 2002, California Native Plant Society 2001).

Distribution in the Planning Area

There are no known occurrences on National Forest System land. Potential habitat is believed to be present along the southwest portion of the Monterey Ranger District due to the presence of occupied habitat about 2 miles south of the district boundary. About 50 acres of this potential habitat is present on the San Carpoforo Allotment. None of these 50 acres can be described as marine terrace so the potential habitat found on San Carpoforo Allotment is notably different than the occupied habitat of this local endemic.

Taxonomy and Natural History

Bloomeria humilis is a monocot in the lily family (Liliaceae) and is closely related to the only other member of its genus – *Bloomeria crocea*. The two congeners are distinguished by their relative number of leaves, inflorescence height, and shape of the perianth lobes (Keator 1993).

Bloomeria humilis is a perennial herb that blooms in June. The plant is capable of asexual reproduction through the production of daughter corms.

Habitat Description

Bloomeria humilis occurs on marine terraces in coastal bluff scrub, chaparral, and valley and foothill grasslands at an elevation of 33 to 395 feet (10 - 120 meters) (California Native Plant Society 2001). Associates include *Nasella pulchra*, *Grindelia* sp., *Calochortus albus*, *C. luteus*, *C. clavatus* var. *recurvifolius*, *Ceanothus maritimus*, *Ceanothus hearstiorum*, *Allium hickmanii*, *Arctostaphylos cruzensis*, *A. hookeri* ssp. *hearstiorum*, *Carex obispoensis*, and *Sanicula maritima* (California Natural Diversity Database 2004). *Bloomeria humilis* appears to be restricted to deep clay soils (Keil and McLeod 1987) on open mesas near ocean bluffs (Utech 2002).

Occurrence Status

According to Hoover (1970), *Bloomeria humilis* is highly localized in its distribution but locally plentiful. One occurrence on Hearst Corporation Land (mesa south of Arroyo de la Cruz) had more than 1,000 plants in 1985 (California Natural Diversity Database 2004).

Threats

All of the known occurrences of *Bloomeria humilis* are on land owned by the Hearst Corporation and managed for livestock production. The effects of grazing on *Bloomeria humilis* are unknown.

Conservation and Management Considerations

Surveys on National Forest System land on the Monterey Ranger District are needed to determine this taxon's status on National Forest System land.

Evaluation of Current Situation and Threats on National Forest System Lands

Bloomeria humilis is endemic to northwestern San Luis Obispo County and is found at only two locations, neither of which is on National Forest System lands. However, both of these occurrences are close to recently acquired National Forest System lands on the Monterey Ranger District and unsurveyed potential habitat may be present.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Bloomeria humilis* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to

describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Bloomeria humilis*.

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Botrychium crenulatum

Botrychium crenulatum W.H. Wagner (Scalloped moonwort)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 2-2-1

General Distribution

Botrychium crenulatum occurs at scattered locations throughout California, Oregon, and Washington, and east to Montana, Wyoming, and Utah (California Native Plant Society 2001). The California Natural Diversity Database (2004) lists 17 occurrences in California, six of which are in the table below from San Bernardino and Los Angeles Counties. In California, *B. crenulatum* ranges from southern California north to the Inyo and Modoc national forests (Laeger 2002).

Distribution in the Planning Area

Botrychium crenulatum is well documented from collections in the San Gabriel Mountains at Lamel Spring (Angeles National Forest) and from South Fork Meadows in the San Bernardino Mountains (San Bernardino National Forest). There are also historical occurrences from Coldwater Canyon, Fern Canyon, and Big Meadows on the San Bernardino National Forest (California Natural Diversity Database 2004).

Taxonomy and Natural History

Botrychium crenulatum is a diploid fern in the adder's tongue family (Ophioglossaceae). It commonly occurs with other moonwort species but is distinguished by the size and shape of the sterile leaf parts (Wagner 1993). This perennial rhizomatous herb produces fertile fronds in June and July (California Native Plant Society 2001).

The sterile part of the leaf is separated from the fertile part generally above the middle of the leaf. The

stalk is less than 7 mm. The blade is 1-pinnate, generally less than 6 cm, less than 2 cm wide, oblong, thin, soft, shiny, and yellow-green. The more or less well-separated segments are in 3-5 pairs, not mid-ribbed, and the lower are widely fan-shaped, with margins at the base meeting at 120-160 °. The outer margins are generally finely crenate to dentate. The fertile part is 1-2 pinnate, 1.3-3 times the sterile part (Wagner 1993).

Botrychium species live underground for 3-5 years before above-ground parts appear. During this time, the plants are believed to be parasitic on their mycorrhizal associates. There may be 65 to several hundred times more plants underground than above ground. *Botrychiums* can live underground for approximately 5-10 years and produce above-ground parts for an average of 5 years. Spore germination occurs at the mineral-organic soil interface. Gametophytes can also reproduce asexually as their clustered underground gemae are dislodged. For this reason, above ground plants are often found in clusters (Johnson pers. comm.).

Dr. Don Farrar is conducting genetic studies on *Botrychium crenulatum* in addition to several other species of *Botrychium*; some of his specimens are from the San Bernardino and Angeles National Forests.

Habitat Description

Botrychium crenulatum is a very cryptic plant that occurs in meadows, seeps, springs, and streambanks generally in shaded areas of montane coniferous forest at elevations of 4,900–10,750 feet (1,500–3,280 meters) (California Native Plant Society 2001). *Botrychium crenulatum* is often found in association with *Carex aurea*. Other associates include *Dodecatheon* spp., *Pteridium aquilinum* var. *pubescens*, *Sisyrinchium bellum*, and *Luzula comosa* (USDA Forest Service 2002).

Meadows, seeps, springs, and riparian areas are well distributed within the Planning Area, but these habitats occupy narrow corridors and pockets, comprising a low overall acreage. Within these general habitats, *Botrychium crenulatum* requires very specific microhabitats, such as wet meadow areas that hold late season moisture. These microhabitats are narrowly distributed within the overall habitat assemblages. (Laeger 2002) *Botrychium crenulatum* tends to occupy areas that are slightly wetter than *Botrychium simplex* and is generally found in areas near perennial surface water (Farrar pers. comm.).

Botrychium species tend to occupy well-drained moist, gravelly, sandy, or calcareous soils. They sometimes inhabit areas that have experienced historical disturbance (10-15 years prior), such as old roads, ski runs, railroad right-of-ways, and old pipelines. Soil disturbance may bring minerals, such as calcium, to the surface (Farrar pers. comm.).

Occurrence Status

The factors that limit the abundance and distribution of *Botrychium crenulatum* are largely unknown; however, all species of moonwort are known to have mycorrhizal requirements. In addition, plants are

highly variable and difficult to identify because moonwort species may occur in mixed populations. The overall recorded plant numbers in California are low, and each occurrence often consists of only a few observed plants (Powell and Blackwell 2001). However, based on this plant's peculiar life history, for every plant observed many likely go undetected.

The following table shows the recorded occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Botrychium crenulatum* (Scalloped moonwort)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
2	U	1907	1.5 mi. E of town of Forest Falls along Mill Creek Canyon. South Mountain: Fern Canyon, branch of Mill Creek near Mill Creek Falls, opposite Vivian Creek Falls. Mapped at jct. of Mill Cr./Vivian Cr. Needs fieldwork. SBNF.	SBD
3	U	U	South Fork Santa Ana River, ca. halfway btw. Poopout Hill and Slushy Meadows (South Fork Meadows). SBNF-San Gorgonio Wilderness.	SBD
4	U	U	Santa Ana River, Big Meadows. 0.5 mi. S of Hwy 38, 0.3 mi. ESE of Heart Bar State Park Headquarters. Searched for in 2002, but no plants found and area appeared too dry to be suitable. SBNF.	SBD

6	U	U	Bluff Lake Meadow, San Bernardino Mtns. Mapped at Bluff Lake 1.5 mi. S of Treasure Island, Big Bear Lake. Wildlands Conservancy.	SBD
7	U	1917 (RSA)	San Gabriel Mtns. N of Baldy Notch, headwaters of Coldwater Cyn. of Lytle Creek. Mapped 1.6 mi. NNE of Telegraph Peak. Needs fieldwork. SBNF.	SBD
8	U	2002	Lamel Spring, Mt. Baden-Powel Trail, San Gabriel Mtns. Type locality. w/ <i>Dodecatheon redolens</i> . ANF (in SIA, adj to wilderness).	LA
*	14	2002	Stringer meadow (W extent of S. Fork Meadow) ca. 0.5 mi. above jct. of Dry Lake Trail and Dollar Lake Trail, immediately adj. to Dry Lake Trail just S of switchback. Spring/stringer meadow surrounded by <i>Pinus jeffreyi</i> , <i>Abies concolor</i> , <i>Salix</i> sp. w/ <i>Pteridium aquilinum</i> var. <i>pubescens</i> , <i>Carex aurea</i> , <i>Helenium bigelovii</i> , <i>Heracleum</i> , <i>Platanthera</i> , <i>Sisyrinchium bellum</i> , <i>Gentianopsis acuta</i> , <i>Luzula</i> , <i>Lilium parryi</i> , <i>Gentiana fremontii</i> . 12 plants growing beneath <i>Pteridium</i> . 2 beside the stream. SBNF-San Gorgonio Wilderness.	SBD
639717 (RSA)	U	1968	NE slope of Mt. San Antonio. Headwaters of W fork of N fork of Lytle Creek T2N, R7W, NW1/4 NW1/4 S 5. elev. 8900 ft., wet sunny meadow, steep N slope. (Wheeler/RSA) SBNF	SBD

49784 (RSA)	U	1924	Lost Creek, San Bernardino Mts. Bank of creek at 7400 ft. (Munz/RSA) SBNF, San Gorgonio Wilderness.	SBD
11130B (RSA) 96698 (RSA)	U	1922 1926	S fork of Santa Ana River, San Bernardino Mts. Meadows, 7500-8500 ft. (Munz RSA) (Wagner/UC/Jeps). SBNF	SBD
49783 (RSA)	U	1924	San Bernardino Mts., So. Mission Creek, elev. 8500 ft. (Munz/RSA)	SBD

- *U* = Unknown
- * = an occurrence number has not been assigned
- SBNF = San Bernardino National Forest
- ANF = Angeles National Forest
- SBR = San Bernardino County
- LA = Los Angeles County

Threats

Botrychium crenulatum is threatened by trampling, ground disturbance and soil compaction, and changes in hydrologic regimes (California Native Plant Society 2001, California Natural Diversity Database 2004, Johnson, pers. comm. 2002). These impacts generally result from off-trail activity, trail use and maintenance. Because this taxon is dependent upon mycorrhizal associations, ground-disturbing activities which disturb mycorrhizae are also direct threats to *Botrychium crenulatum*. Fire does not appear to significantly impact *Botrychium* populations (Johnson, pers. comm.).

Conservation and Management Considerations

The primary short-term conservation strategy for *Botrychium crenulatum* is to implement the Meadow Habitat Management Guide, to improve the knowledge of its distribution, and protect localities where threats are most pronounced. The following is a list of conservation practices that should be considered for this species:

- Implement the SBNF Meadow Habitat Management Guide.
- Survey all new occurrences of *Botrychium crenulatum* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Botrychium crenulatum* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at

least five years prior.

- Map known and new occurrences of *Botrychium crenulatum* in the area using NRIS data collection standards.
- Where this species occurs near a trail with apparent off-trail impacts, install "sensitive plant habitat, stay on trail," signage.
- Continue Forest participation in the Region 5 *Botrychium* study including collection of materials for Dr. Farrar.

Evaluation of Current Situation and Threats on National Forest System Lands

Botrychium crenulatum is a widely scattered rare species known in the plan area only to occur in a few meadow areas on the SBNF and ANF. These areas are not well protected from identified threats.

Based on the above analysis, *Botrychium crenulatum* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Botrychium crenulatum is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

This taxon is included in the SBNF Meadow Habitat Management Guide. Consideration of the Suitable Use restricting vehicle travel to designated Forest Transportation System roads and trails, along with Standards related to riparian conservation areas and recreation factor into these outcomes.

The primary ongoing threats to this species on NFS lands are trail use and management, and associated off-trail use in meadow areas near watercourses. Historical habitat for this species in the headwaters of Coldwater Canyon may be indirectly affected by operation and/or expansion of the Mt Baldy ski area.

Under all alternatives, this species would be at continued risk from hiking and equestrian impacts to its attractive streamside habitat at approximately current levels. Under all alternatives, the occurrences at

South Fork Santa Ana River are within the San Gorgonio Wilderness, and within an area designated as eligible for Wild and Scenic River designation. Under all alternatives, the Lamel Spring type locality is within an SIA and immediately adjacent to Wilderness. Under Alternatives 1, 2, and 3, Back Country Non-motorized zoning on the northeast slope of Mount San Antonio would provide a level of protection for the upper Coldwater occurrence. Under Alternatives 4 and 5, this same area would be zoned Back County. Under Alternatives 4a and 6, this occurrence and the occurrence from the headwaters of the West Fork of the North Fork of Lytle Creek would be within recommended expansions of the Sheep Mountain and Cucamonga Wilderness Areas.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	B	B

The status of this species outside of southern California was not researched in detail, however, the San Bernardino and San Gabriel Mountains portion of this species range is such a small and disjunct portion of the range of this species that there are not expected to be any effects of decline outside California on the persistence of this species here. This species is also addressed in detail under the Sierra Nevada Framework.

By maintaining the current distribution of the *Botrychium crenulatum* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause the *Botrychium crenulatum* to suffer a decline in its overall distribution.

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Bloomeria humilis

Boykinia rotundifolia

Boykinia rotundifolia

Boykinia rotundifolia C. Parry (Round-leaved boykinia)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: not rated (California Natural Diversity Database)

California Native Plant Society (2001): not rated.

General Distribution

Boykinia rotundifolia occurs in the southern outer coast range, Transverse ranges, and Peninsular ranges. Occurrences are known from the San Bernardino, San Gabriel, San Jacinto, Santa Ana, Elsinore, Palomar, and Volcan mountains, and the Cuyama Valley.

Distribution in the Planning Area

There are known occurrences on the San Bernardino and Angeles national forests. On the San Bernardino Mountains, occurrences are known at City Creek, below Crestline, around the springs below Camp Angelus, Water Canyon off of Wildwood Canyon, east of Fredalba, west of Barton Flats, Waterman Canyon, and Sawpit Canyon. It is also reported from the San Jacinto Mountains (Krantz, et. al. draft 2000; USDA Forest Service 2003), and the Los Padres National Forest (USDA Forest Service 2003).

Taxonomy and Natural History

Boykinia rotundifolia is a dicotyledon in the saxifrage family (*Saxifragaceae*). This species flowers between June-July (Munz 1974). *Boykinia rotundifolia* has leaves are 10-30 cm. The stipules are inconspicuous and generally brown-bristled. The petiole is 5-18 cm. The blade is up to 18 cm wide, is divided less than 1/8 of the way to the base, and has lobes and teeth that are more or less round-sided. The inflorescence is 3-10 cm, tapered, and dense. The calyx lobes are 2-3 mm and triangular. The petals are 2-3 mm and obovate (Elvander 1993).

Habitat Description

Boykinia rotundifolia occupies streambanks and wet places in canyons in chaparral, lower montane coniferous forest, and upper montane coniferous forest below 2000m (Elvander 1993; Munz 1974).

Although chaparral and montane coniferous forest are widespread within the planning area, wet areas and streambanks within these habitats are very narrowly distributed.

Occurrence Status

There are at least nineteen documented occurrences within the four southern California National Forests (CalFlora 2002). In addition, there are other documented occurrences with non-specific location information. *Boykinia rotundifolia* is more common than previously thought; a large amount of potential habitat in most of the drainages on the coastal slopes of southern California.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Boykinia rotundifolia* (Round-leaved boykinia)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
*	165	2002	Along the Santa Ana River, just W of Filaree Flat and confluence of Cold Creek, San Bernardino Mountains. Along riverbed at water's edge. Mostly in shady, moist areas, in sandy/rocky loam. Some plants in sunny rock outcroppings. Steep, narrow canyon. W/ <i>Urtica dioica</i> , <i>Alnus rhombifolia</i> , <i>Scirpus microcarpus</i> , <i>Epilobium ciliatum</i> , <i>Juncus effusus</i> , <i>Oenanthe sarmentosa</i> , <i>Holcus lanatus</i> , <i>Ribes nevadense</i> , <i>Rorippa nasturtium-aquaticum</i> , <i>Barbarea orthoceras</i> , <i>Carex bolanderi</i> , <i>Verbascum thapsus</i> , <i>Mimulus guttatus</i> , <i>Stachys albens</i> , <i>Rumex crispus</i> . Several plants grazed by	SBD

			herbivore. SBNF.	
1817800	U	1993	Warm Springs Cyn, along FR 1S12, 2.3 mi. below JCT w/ FR 1N12. SBNF.	SBD
1213872	U	U	Waterman Canyon. SBNF.	SBD
1321475	U	1965	Icehouse Canyon, ca. 1 mi. up. San Gabriel Mountains. ANF.	SBD
1208242	U	1932	Snow Creek, Colorado Desert, San Jacinto Mountains. Land owner: U.	RIV
1816772	U	1987	San Jacinto Mtns, Vista Grande Rd. Land owner: U.	RIV
1213869	U	1918	Santa Anita Canyon. Land owner: U.	LA
1407741	U	1903	Glendora. Land owner: U.	LA
1192473	U	1960	Malibu Canyon, 0.4 mi. S of tunnel; 3 mi. N of coast highway 101. Santa Monica Mtns. Land owner: U.	LA
1128218	U	1941	Eaton Creek, San Gabriel Mtns. Land owner: U.	LA
1815738	U	1893	Rock Creek, San Gabriel Mtns. Land owner: U.	LA
1415382	U	1934	San Antonio Canyon, at foot of Baldy Trail. San Gabriel Mtns. ANF.	LA

1816775	U	1922	Big Dalton Canyon, San Gabriel Mtns. ANF.	LA
1128219	U	1940	N slope San Gabriel Peak, San Gabriel Mtns. ANF.	LA
*	U	2002	Two occurrences S of Miller Canyon, E of Hwy 138, N of Lake Gregory. (Exact locations U). NW-aspect w/in ravines. Southern alder riparian woodland. Moist soil. Occurrences observed in two perennial drainages within the proposed Rim of the World Trail project area. The proposed route intersects part of one occurrence. The other occurrence is below the proposed route. SBNF.	SBD
265674 (RSA)	200 estimated	2004	Bonita Falls, small canyon on the S. side of the S. fork of Lytle Creek. Parking near recreation area just S. of Scotland, on vertical rock faces near waterfall and in stream course of riparian area, T2N/R6W/S27. (Fraga/RSA)	SBD
226085 (RSA)	12	2004	Off of Rd. 1N34 at Grapevine Springs, T1N/R6W/S2, (Fraga/RSA)	SBD
637656 (RSA)	200 estimated	2004	Day Cyn. Southern watershed of Cucamonga Peak, T1N/R6W/S8 (Fraga/RSA)	SBD

49900 (RSA)	400 estimated	2004	S. fork of Cascade Cyn. Off of the Barratt Stoddard Rd. (2N041). W. of Ontario Peak, T2N/R7W/S31 (Fraga/RSA)	SBD
161296 (RSA)	290 estimated	2004	Evey Cyn. Near the intersection of Evey Cyn. Rd. and Mount Baldy Rd., T1N/R8W/S11 (Fraga/RSA)	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*
- *RIV = Riverside County*

Threats

Habitat for *Boykinia rotundifolia* is threatened by water diversion, roads, trails, and recreation activities.

A substantial portion of this species range burned in 2003 in the Old and Grand Prix fires. Fire response is not known, but the burned watersheds may pose a threat of flooding and debris flows to occurrences across the San Gabriel and San Bernardino front country from San Antonio Creek to the Santa Ana River.

Conservation and Management Considerations

The primary conservation strategy for this species is to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for *Boykinia rotundifolia*:

- Survey riparian habitat along the coastal drainages for this species and associated rare plants including *Muhlenbergia californica*.
- Survey all new occurrences of *Boykinia rotundifolia* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Boykinia rotundifolia* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Boykinia rotundifolia* in the Province using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Boykinia rotundifolia is a southern California endemic, known from scattered occurrences and mostly from National Forest System Lands. While none of these occurrences are fully protected from identified threats, several occurrences across the range are not at risk, and considerable areas of unsurveyed suitable habitat exists for this species.

Based on the above analysis, *Boykinia rotundifolia* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Boykinia rotundifolia is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Boykinia rotundifolia* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Boykinia rotundifolia* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for All Land within Range of Taxon

By maintaining the current distribution of *Boykinia rotundifolia* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Rancho Santa Ana Botanic Garden Herbarium

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Botrychium crenulatum

Brodiaea filifolia

Brodiaea filifolia

Brodiaea filifolia S. Watson (Thread-leaved brodiaea)

Management Status

Federal: Threatened (63 FR 54975, 13 October 1998); Critical Habitat proposed December 8, 2004 (69 FR 71283)

California: None

Heritage Rank: G2, S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

Critical Habitat (CH) for *Brodiaea filifolia* was proposed by the USFWS on December 8, 2004 for approximately 4,690 acres in 10 separate units in Los Angeles, San Bernardino, Orange, and San Diego Counties (69 Federal Register 71283) (U.S. Fish and Wildlife Service 2004). In determining which areas to designate as CH the USFWS considers those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These features are termed Primary Constituent Elements (PCEs) and they are summarized in the proposed rule (U.S. Fish and Wildlife Service 2004). A final rule to designate CH for *Brodiaea filifolia* has not been made.

General Distribution

Brodiaea filifolia, Thread-leaved brodiaea occurs in the western foothills of the San Gabriel and San Bernardino Mountains, on the western slope of the Peninsular Ranges, and along the coastal terraces of southern California in Orange, Riverside, Los Angeles, San Bernardino, and San Diego counties (California Natural Diversity Database 2004).

Distribution in the Planning Area

Within the Southern Province National Forest System lands, *Brodiaea filifolia* is only known from the Cleveland National Forest (CNF). These three occurrences, reported as hybrid plants with another Forest sensitive species, *B. orcuttii*, are located on Miller Mountain and tributaries of Devil Canyon, all within the San Mateo Wilderness. There are no documented true *B. filifolia* plants on National Forest System

lands. Potential habitat is present on both the Cleveland and San Bernardino National Forests.

Taxonomy and Natural History

Brodiaea filifolia is an herbaceous perennial from a dark brown, fibrous coated corm. Flowering stalks are 20-40 cm, having several leaves per plant. *Brodiaea filifolia* flowers from March through June with violet perianths in an umbel inflorescence. The linear, tapered staminodes, 2-4 (7) mm long, reflexed against the tepals distinguishes this species from other congeners (California Native Plant Society 2001, Keator 1993). Plants hybridize with *B. orcuttii*, a Forest Service Sensitive species.

Not all corms sprout each year. It is estimated that the corm to flowering ratio is between 8:1 or 10:1 in normal precipitation years and can be as high as 1000:1 in dry years (California Department of Fish and Game 1995). Plants may respond favorably to shallow plowing due to decreased competition from introduced weeds (California Native Plant Society 1979; California Department of Fish and Game 1995). Bulbs are buried deep in the ground, undisturbed by shallow plowing. Grazing is also a compatible land use practice in *B. filifolia* sites (California Department of Fish and Game 1995). Transplantings of bulbs have been successful.

Habitat Description

Brodiaea filifolia occurs in vernal pools and other wet areas in annual grassland or open, grassy areas in cismontane woodland, coastal scrub, and chaparral, usually associated with clay, loamy sand, or alkali silty clay soils between 40 and 1220 meters (130 – 4000 feet) in elevation (California Native Plant Society 2001, Stephenson and Calcarone 1999, U.S. Fish and Wildlife Service 2001). Associated soils series included Las Posas in San Diego County, and occasionally in granite outcrops with vernal seepages. In other locations *B. filifolia* occurs on alkali and sandy loam, including Diablo Clay/Carlsbad gravelly loamy sand, saline-alkaline Grangeville fine sandy loam, alkaline sink and vernal pool, Wakena loam/Domino silt-loam, Las Flores loamy sand (California Natural Diversity Database 2004).

Populations on the Cleveland NF occur in association with southern coastal needlegrass grassland on clay soil along the top of Miller Mountain (California Natural Diversity Database 2004) and surrounding Devil Canyon. Plants in Miller Canyon are on rock outcrops or on deposits of gravel, cobble, and small boulders in association with *Juncus macrophyllus* (long-leaved rush) and *Muhlenbergia rigens* (deergrass) and other riparian plants. *Other associated species include Avena fatua, Brachypodium distachyon, Brassica nigra, Bromus diandrus, Carduus pycnocephalus, Convolvulus arvensis, Gnaphalium bicolor, G. californicum, Helianthus annuus, Lactuca serriola and Lessingia filaginifolia var. filaginifolia.*

Occurrence Status

The California Natural Diversity Database (CNDDB) lists 60 occurrences, six of which presumed extirpated (California Natural Diversity Database 2004). Most occurrences are located on private lands

(57% of the known extant occurrences) with population numbers ranging from 5 to 24,000 plants. The remaining occurrences are protected on The Nature Conservancy, city, county, state, or federal lands. The largest occurrence is on privately owned land with an estimated 24,000 plants on Carillo Ranch, west of the city of San Marcos (California Natural Diversity Database 2004, CNDDDB Occ. # 22). Five occurrences are recorded for the Santa Rosa Plateau owned by The Nature Conservancy. Other substantial occurrences are located on Department of Defense at Camp Pendleton Marine Corps Base. On the Cleveland NF, the three recorded occurrences of *B. filifolia* in the CNDDDB are documented as *B. filifolia* x *B. orcuttii* hybrids. No true *B. filifolia* plants occur on National Forest System lands.

OCCURRENCE DATA of *Brodiaea filifolia* x *Brodiaea orcuttii* (Thread-leaved brodiaea hybrids) on National Forest lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
37	*	15000-20000	1992	Miller Mountain / CNF	SD
38	*	50	1992	Devil Canyon / CNF	SD
39	*	Few-1000	1992	Sky Ranch vicinity / CNF	SD

- *U* = Unknown.
- * = an occurrence number has not been assigned.
- CNF = Cleveland National Forest
- SD = San Diego County

Threats

Coastal and urban development is the major factor threatening existing populations of *Brodiaea filifolia*. Occurrences on protected local municipalities, state, federal or The Nature Conservancy lands are threatened by nonnative weed invasions.

The three occurrences on within the San Mateo Wilderness are all hybrid populations. Seasonal grazing is the only land management practice potentially affecting the hybrid *B. filifolia* occurrences on Miller Mountain on the Cleveland NF. The grazing season from 15 August to 1 January avoids the growing season of *B. filifolia* for the most part. Flowering and seed set will have occurred prior to the beginning of the grazing season in August. In years when precipitation arrives early (November), plants may emerge early and be subjected to some trampling or consumption. Soil compaction in early, heavy

rainfall years may have impacts to plant forms. However, in a typical year, soil compaction is minimal as soils remain dry for most of the grazing season (U.S. Fish and Wildlife Service 2001).

The Sky Ranch occurrence is adjacent to Forest system road, 8S01, bordering the San Mateo Wilderness. This site is potentially affected by erosion and dust accumulation from road use. However, visitation rates are low due to the remoteness of this road. The Devil Canyon occurrences is also remote and completely in the San Mateo Wilderness. Access to this site is limited. No threats to this occurrence are known.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Brodiaea filifolia*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Survey modeled habitat.
- Maintain the geographic and genetic diversity of the species or "evolutionary unit" by protecting all known populations on Federal lands. Promote genetic studies of hybridization events within sympatric *B. filifolia* and *B. orcuttii* sites.
- Allow wildland fires to freely burn on through populations. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks and roads, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. The use of hand line for fuel break construction is preferred.

Evaluation of Current Situation and Threats on National Forest System Lands

There are no pure populations of *Brodiaea filifolia* currently known on National Forest System lands. Potential habitat exists on the San Bernardino and Angeles national forests, and hybrid populations are found on the Cleveland National Forest. The genetic and conservation implications of hybridization and introgression between *B. filifolia* and *B. orcuttii* are unknown. These populations can experience outbreeding depression resulting in decrease seed production and overall fitness and/or assimilation resulting in loss of genetic characteristics (Ellstrand and Elam 1993). Natural introgression and hybridization occur commonly in plant populations. However, genetic and conservation implications are more important with rare or sensitive species in small populations. The introduction of non-native honeybees may have increased the potential for hybridization between *B. filifolia* and *B. orcuttii* (U.S. Fish and Wildlife Service 1998). If hybrid progeny plants are viable and vigorous then the sensitive parent species is at risk of assimilation, resulting in hybrid swarms, swamping the unique characteristics of the rare species. If the progeny are infertile then the rare species is at risk of outbreeding depression (Ellstrand and Elam 1993). In the case of *B. filifolia* x *B. orcuttii*, infertile hybrids would leave both these rare species at risk of local extirpation at these hybrid sites if perennial corms were catastrophically eliminated. Further studies of genetic viability of parent and hybrid plants are necessary. If *B. filifolia* and *B. orcuttii* are assimilated at these sites, populations would remain vital for

conservation biology as an "evolutionary significant unit" (Rhymer and Simberloff 1996). No substantial threats to the hybrid populations from Forest Service activities have been identified.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

Brodiaea filifolia is listed under the Endangered Species Act of 1973, as amended, as threatened, which assures that on NFS lands, any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

No populations of *Brodiaea filifolia* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Brodiaea filifolia*.

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Boykinia rotundifolia

Brodiaea orcuttii

Brodiaea orcuttii

Brodiaea orcuttii (E. Greene) Baker (Orcutt's brodiaea)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3, S3.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 1-3-2

General Distribution

Brodiaea orcuttii, Orcutt's brodiaea, is endemic to the Peninsular Ranges of San Diego and southern Riverside counties and Baja California, Mexico (Keator 1993). Reiser (1994) also reports a range distribution for San Bernardino and Orange Counties; however, there are no occurrence records in the California Natural Diversity Database (CNDDDB) (California Natural Diversity Database 2004).

Distribution in the Planning Area

Within the southern California National Forest System lands, *Brodiaea orcuttii* is known only from the Cleveland National Forest (CNF). Although most occurrences of *Brodiaea orcuttii* are west of National Forest System lands, 16 occurrences are documented on the CNF. Occurrences include locations at Organ Valley, on Black Mountain; Viejas Valley, southeast of Viejas Mountain; Cajon truck trail, northeast of Rock Mountain; Miller Mountain; Morena Creek watershed; Indian Flats, northwest of Pine Mountain; the west fork of King Creek, Cuyamaca Mountains; Henshaw Truck Trail, north of Lake Henshaw; Palomar Mountain, near Fry Creek; and along Japatul-Dehesa Road (California Natural Diversity Database 2004; CNF records).

Taxonomy and Natural History

Brodiaea orcuttii is an herbaceous perennial from a subglobose corm, 15-20 mm broad, 6-10 cm below ground. Leaves are usually 2, cylindrical, widely channeled in cross section, and often longer than the scape. Plants are 1-4 dm tall, with one to several stalks per corm. An unknown percentage of corms do

not sprout each year. Pedicels are 2-5 cm, unequal. Perianth is purple with widely spreading lobes, 12-19 mm, staminodia lacking. Filaments are 4-6 mm, anthers 4-76 mm, linear. Ovary is 4-6 mm with styles 7-11 mm. Capsules are oblong-ovoid, sessile, 5 mm long (Abrams 1951, Keator 1993). Plants flower from April to July (California Native Plant Society 2001). The lack of staminodia in the perianth distinguishes this species from other congeners. However, *B. orcuttii* easily hybridizes with *B. filifolia*, with hybrids having characteristics intermediate between the two species.

Observations of deer and cattle browsing have been observed. In addition, fire may be beneficial for plants, reducing competition for nutrients and light with nonnative weeds (California Native Plant Society 1977).

Habitat Description

Brodiaea orcuttii occurs along drainages and vernal wet areas in needlegrass grasslands, closed-cone coniferous forest, cismontane woodlands, chaparral, and meadow habitats below 1615 meters (5300 feet). It is associated with clay, serpentine, and gravelly loam soils (California Native Plant Society 2001, USDA Forest Service 1998). Plants thrive in full sun (California Native Plant Society 1977) in the presence of seasonal standing water for a short period of time in seeps, vernal pools, and depressions (Lathrop 1980) and may require drying of the soils during plant dormancy. Summer irrigation of pastures may rot bulbs during dormancy (California Native Plant Society 1977). Associated species include *Brodiaea terrestris* spp. *kernensis*, *Poa atropurpurea*, *Limnanthes gracilis* var. *parishii*, *Dichelostemma pulchellum* and *Deschampsia danthonioides*.

Occurrence Status

The California Natural Diversity Database (CNDDDB) lists 100 occurrences, seven of which are presumed extirpated and 12 are historic or unconfirmed records (California Natural Diversity Database 2004). About 38% of the occurrences are on privately owned land, and 43% are on locally protected lands of the CNF, Department of Defense, Cuyamaca State Park, The Nature Conservancy, and other local municipalities. The CNF has 10 additional records not recorded in the CNDDDB. Occurrences 2-3, 2-4, and 2-5 are unconfirmed records and occurrences 2-8 through 2-14 are hybrid populations with *B. filifolia* in the Miller Mountain/San Mateo Wilderness area.

Population numbers are high at most sites ranging from 25 to over 1000 individuals per site at the "pure" populations. At the Miller Mountain/San Mateo Wilderness area there are over 20,000 hybrid plants.

OCCURRENCE DATA of *Brodiaea orcuttii* (Orcutt's Brodiaea) on National Forest lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County

*	2-1	U	1979	King Creek Research Natural Area / CNF	SD
65	2-2	< 200	1979	Organ Valley Research Natural Area / CNF	SD
*	2-3	U	U	Henshaw / CNF	SD
*	2-4	U	U	Observatory Campground / CNF	SD
*	2-5	U	U	Dehesa Road/ CNF	SD
7?	2-7	U	1976	Johnson Ranch / CNF	SD
*	2-8	20,000a	1995	Miller Mt. / CNF	SD
*	2-9	20,000a	1992	San Mateo Wilderness / CNF	SD
*	2-10	20,000a	1992	San Mateo Wilderness / CNF	SD
*	2-11	20,000a	1992	San Mateo Wilderness / CNF	SD
*	2-12	20,000a	1992	San Mateo Wilderness / CNF	SD
*	2-13	20,000a	1992	San Mateo Wilderness / CNF	SD
111	2-14	20,000a	1992	San Mateo Wilderness / CNF	SD
104	2-15	1000	1995	Viejas Mountain/ CNF	SD

105	2-16	300	1996	El Cajon Truck Trail / CNF	SD
119	2-17	1000	2001	Indian Flats / CNF	SD
118	2-18	25-30	2001	Corral Canyon / CNF	SD
69	*	U	1960	San Mateo Wilderness / CNF??	SD

- *a includes counts for 2-8 through 2-14*
- *U = Unknown.*
- ** = an occurrence number has not been assigned*
- *CNF = Cleveland National Forest*
- *SD = San Diego County*

Threats

Plants and habitat are threatened by urban development, invasion of nonnative weeds, off-highway vehicle (OHV) activity, military training, dumping, road maintenance, grazing, summer irrigation, and changes in ground availability. Occurrences on protected local municipality, state, federal or The Nature Conservancy lands are threatened by nonnative weed invasions.

The occurrences on within the San Mateo Wilderness/Miller Mountain area are all hybrid populations. Seasonal grazing is the only land management practice potentially threatening *B. orcuttii* occurrences on Miller Mountain on the CNF. The grazing season from 15 August to 1 January avoids the growing season of *B. filifolia* and *B. orcuttii*, for the most part. Flowering and seed set will have occurred prior to the beginning of the grazing season in August. In years when precipitation arrives early (November), plants may emerge early and be subjected to some trampling or consumption. Soil compaction in early, heavy rainfall years may have impacts to plant corms. However, in a typical year, soil compaction is minimal, as soils remain dry for most of the grazing season (U.S. Fish and Wildlife Service 2001).

Several of the CNF occurrences (2-4, 2-16, and 2-17) are adjacent to Forest system roads, campgrounds, or trails. Occurrence 2-16, near El Cajon Truck Trail, is potentially threatened from erosion and dust accumulation from road use. However, visitation rates are low due to the remoteness of this road. The remaining occurrences are in remote areas receiving few visitors. No threats to these occurrences are known.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Brodiaea orcuttii*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Maintain the geographic and genetic diversity of the species or "evolutionary unit" by protecting all known populations on Federal lands. Promote genetic studies of hybridization events within sympatric *B. filifolia* and *B. orcuttii* sites.
- Allow wildland fires to freely burn on through populations. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks and roads, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. The use of hand line for fuel break construction is preferred.

Evaluation of Current Situation and Threats on National Forest Systems Lands

Brodiaea orcuttii has low vulnerability to local extirpation on National Forest System lands. The CNF has 18 recorded occurrences with the majority of the locations are in remote areas receiving few visitors. Population numbers are high at most sites ranging from 25 to over 1000 individuals per site at the pure populations. At the Miller Mountain/San Mateo Wilderness area there are over 20,000 hybrid plants. No Forest Service activities have been identified that substantially threaten these occurrences. Two occurrences are known to have been affected by the Cedar fire in 2003, but, as noted above, this species may benefit from fire.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon endemic in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Brodiaea orcuttii is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Brodiaea orcuttii*. Variations in land use designations would not alter this current situation, and the various emphases of the alternatives would not result in a substantial change in conditions for *Brodiaea orcuttii*. *Brodiaea orcuttii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Lands within Range of the Taxon

Brodiaea orcuttii occurrences throughout its range are threatened by development and non-native species invasion. Approximately 19% of the documented occurrences in the CNDDDB are extirpated or old unconfirmed records and 38% are on private lands. Because large portions of this species' occurrences are protected (43% on city, county, state, or federal lands), *Brodiaea orcuttii* has a low vulnerability for extinction throughout its range. By maintaining the current distribution of *Brodiaea orcuttii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Brodiaea orcuttii* to suffer a decline in its overall distribution.

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Brodiaea filifolia

**Calochortus clavatus var.
gracilis**

Calochortus clavatus var. gracilis

Calochortus clavatus Wats. var. *gracilis* Ownbey (Slender mariposa lily)

Management Status

Federal: None

State: None

Heritage Rank: G4T1 S1.1? – very threatened? (California Natural Diversity Database)

California Native Plant Society (2001): List 1B, R-E-D Code 3-2-3

General Distribution

Calochortus clavatus var. *gracilis* is endemic to the southern foothills and canyons of the San Gabriel Mountains (Allan et al. 1995) and the western Transverse Range, from near Liebre Mountain (near the Ventura County line) east to Claremont (near the San Bernardino County line). All recorded occurrences are in Los Angeles County. The California Natural Diversity Database (2004) contains records for ten occurrences and approximately nine additional records are vouchered at Rancho Santa Ana Botanic Garden.

Distribution in the Planning Area

About 10 occurrences of *Calochortus clavatus* var. *gracilis* are reported from the Angeles National Forest, including the West Fork San Gabriel River, Bichota Canyon, and San Francisquito Canyon (California Natural Diversity Database 2004). Five of these records are more than 50 years old. Three additional records are near the ANF boundary and may be on ANF or adjacent private land. The Osito Canyon record is less than 3mi east the Los Padres NF boundary, and the Lookout Peak and Evey Canyon records are less than 3mi west of the SBNF boundary, so it is possible that future surveys will locate this taxon on these Forests.

Taxonomy and Natural History

Calochortus clavatus var. *gracilis* is a monocot in the lily family (Liliaceae). It is one of five varieties of clubhair mariposa lily that occur in California. *Calochortus clavatus* var. *gracilis* differs from the other varieties in geographic location, plant stature, and floral and leaf characters (Fiedler and Ness

1993).

Calochortus clavatus var. *gracilis* is a perennial bulbiferous herb that blooms March-May (California Native Plant Society 2001). The flowering period has also been reported to be from April-June (Alan and others 1995).

Habitat Description

Calochortus clavatus var. *gracilis* occupies shaded foothill canyons on steep grassy slopes within chaparral and coastal sage scrub at elevations of 1,200-3,300 feet (360-1,000 meters) (California Native Plant Society 2001, California Natural Diversity Database 2004).

Occurrence Status

Calochortus clavatus var. *gracilis* is distributed in several highly restricted occurrences or is present in such small numbers that it is seldom reported; it may be in danger of extirpation in a portion of its range (California Native Plant Society 2001). Population trends on National Forest System lands are unknown (Stephenson and Calcarone 1999).

OCCURRENCE DATA – *Calochortus clavatus* var. *gracilis* (Slender mariposa lily)

Occurrence No.	No. of Plants	Year Reported	Location/Land Owner	County
CNDDDB#1, RSA#162807 (Olmstead)	U	1959	Evey Canyon, above Claremont. Ownership ANF or private	LA
CNDDDB#2, RSA68673 (Peirson)	U	1921	West Fork San Gabriel River, 2250'. ANF	LA
CNDDDB#3, RSA175576 (Crow)	U	1930	Bichota Cn, North Fork San Gabriel. ANF	LA
CNDDDB#4, RSA600025 (Boyd)	U	1922, 1997	San Fransisquito Cn, just N of confluence with Bee Cn. ANF	LA
CNDDDB#5 (Rodrick)	U	1962	Mint Canyon. ANF or private.	LA

CNDDDB#6 (Ownbey)	U	1930	Pico Canyon, Newhall area. Private (probably extirpated)	LA
CNDDDB#7	U	1994	Bee Canyon confluence with Soledad Canyon. Private	LA
CNDDDB#8 (White)	5	1995	Near I-5 junction with I-14. Private, extirpated by landfill expansion.	LA
CNDDDB#9	50	1995	Near CNDDDB#8 and adjacent to landfill expansion. Private	LA
CNDDDB#10 and 11, and S. White-6512.	U	2000	Newhall area, surveys for proposed development. Likely extirpated. Private	LA
RSA572922 (Mallory)	U	1994	SE of Bee Cn, 1500' E of Soledad Cn Rd. ANF or private.	LA
RSA599456 (Boyd)	U	1997	Upper Osito Cn. ANF	LA
RSA600477 (Boyd)	U	1997	Confluence of Bear Ck and Pine Creek, between Liebre Mtn and Red Rock Mountain. ANF.	LA
RSA377333 (Wheeler)	U	1932	San Dimas Canyon, 1750'. ANF (San Dimas Experimental Forest)	LA
RSA641373 (Mistretta)	U	1995	Lookout Mountain Trail, 5950'. ANF (Sheep Mtn Wilderness)	LA
RSA627540 (White)	U	1998	Between Castaic Lake and I5. Private.	LA
RSA618709 (White)	U	1998	Soledad Canyon, survey was for proposed quarry (extirpated?)	LA

POM1713 (Moles)	U	1999	Cobal Cn, 1500'. Marshall Cn Regional Park.	LA
RSA377340 (Davidson)	U	1914	San Gabriel Canyon (ANF?)	LA
* (RSA)	U	2004	Evey Cyn. Along Evey Cyn. Rd. ca. 0.5 mi. from Mount Baldy Rd. on the S. side of road cut, t1N/R8W/S14 (Fraga/RSA)	LA

- *U = Unknown*
- *ANF = Angeles National Forest*
- *LA = Los Angeles County*

Threats

Specific threats to *Calochortus clavatus* var. *gracilis* on National Forest System lands have not been identified, but information on National Forest System land occurrences is extremely limited and much of this information is over 50 years old. The association of this species with low-elevation shrubland habitats near the wildland-urban interface makes this species vulnerable to WUI treatments. Most non-federal occurrences are threatened by landfill expansion, residential development projects, sand and gravel mining, and off-highway vehicle activity (Stephenson and Calcarone 1999, California Natural Diversity Database 2004).

Conservation and Management Considerations

Information on occurrences of *Calochortus clavatus* var. *gracilis* on National Forest System lands is needed, as the greatest threat to this species may be poor knowledge. All proposed WUI treatments within the range of *Calochortus clavatus* var. *gracilis* should include focused surveys for this taxon.

- Search for historic localities, perform focused surveys of habitat in proposed WUI treatment areas, and record all new occurrences of *Calochortus clavatus* var. *gracilis* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Calochortus clavatus* var. *gracilis* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Calochortus clavatus* var. *gracilis* in the planning area using NRIS data collection standards.

Evaluation of Current Situation and Risks on National Forest System Lands

Based upon the above analysis *Calochortus clavatus* var. *gracilis* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	B	C	B	C	B

Calochortus clavatus var. *gracilis* is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Threats to this species on the ANF are largely unknown, but include fuels and vegetation treatments of the WUI, OHV use, road maintenance, power line right-of-way maintenance. Of these threats, only OHV use and road maintenance substantially vary by alternative. The viability of San Dimas Canyon and Lookout Mountain occurrences do not vary by alternative as they are within existing Experimental Forest and Wilderness zones, respectively. Alternatives 3, 4A, and 6 are zoned with a tendency of less motorized use in the areas near the remaining recorded occurrences. Alternative 5 is zoned to increase motorized use in these areas.

Consideration of the Suitable Use restricting vehicle travel to designated Forest Transportation System roads and trails, along with the Standards for roads and trails, factor into these outcomes.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

About half of all recorded occurrences of *Calochortus clavatus* var. *gracilis* are on private land at great risk of extirpation from residential, commercial and industrial development (about four of these are likely extirpated to date). Therefore, viability of this species across its range is tied to Forest Service Management. By maintaining the current distribution of *Calochortus clavatus* var. *gracilis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Calochortus clavatus* var. *gracilis* to suffer a decline in its overall distribution.

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Calochortus dunnii

Calochortus dunnii Purdy (Dunn's Mariposa Lily)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.1 (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-2

General Distribution

Calochortus dunnii, Dunn's mariposa lily, is present in the southern Peninsular Ranges from southern San Diego County and Baja California, Mexico (Fiedler 1993).

Distribution in the Planning Area

Within the southern California National Forest System lands, *Calochortus dunnii* is only known from the Cleveland National Forest (CNF). The CNF has 18 occurrence records for *Calochortus dunnii* on the Forest. Plants occur on the West Fork King Creek, north of Morena Creek and Palomar, Barber and Guatay Mountains. Occurrences off the National Forest System lands are on Jamul and Otay Mountains on Bureau of Land Management land (California Natural Diversity Database 2002).

Taxonomy and Natural History

Calochortus dunnii is a branched herbaceous perennial from a bulb. Plants are 20-60 cm tall with basal leaves 10-20 cm long, channeled and withering. Sepals are 10-20 mm and the flowers are 2-6, erect with 1-2 cm bracts. Petals are 20-30 mm, rounded, white or flushed pink with a red-brown a spot or stripe above the nectary and yellow hairs near and in the nectary. Nectary is rounded and not depressed. Fruits are erect, 2-3 cm, linear, and angled (Fiedler 1993). Plants flower from April to June. The number of bulbs that flower in a year may be dependent on rainfall averages for the year. Decreased flowering was observed at San Miguel Mountain during a low rainfall year (Reiser 1994).

Plants may respond favorably to disturbance and fire, as observed on the Guatay Mountain fuel break. Like other *Calochortus* species, *C. dunnii* appears to be a fire follower, occupying early successional habitats following disturbance (Sproul and Beauchamp 1979).

Habitat Description

Calochortus dunnii is associated with gabbro and metavolcanic soils or sandstone, in closed-cone coniferous forest, rocky openings in chaparral, and grassland/chaparral ecotones at elevations of 1,220–5,950 feet (375–1,830 meters) (California Native Plant Society 2001, Reiser 1994).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 26 occurrences (California Natural Diversity Database 2002). The Cleveland NF has five additional occurrences not recorded in the CNDDDB. Several of the CNDDDB and Cleveland NF occurrences are old unconfirmed sightings. Eighteen of the recorded occurrences are located on the Cleveland NF, comprising about 60% of the known extant populations (Table 1). The remaining occurrences are on private lands and locally protected lands owned by the Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), and Cuyamaca Rancho State Park. Population numbers on the CNF range from one plant per occurrence record to over 50 plants at one occurrence on Guatay Mountain. Population numbers off Forest are largely unknown; however, some CNDDDB occurrences record numbers from 5-15 plants per site.

TABLE 1. OCCURRENCE DATA of *Calochortus dunnii* (Dunn’s mariposa lily)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
1	U	10 to 15 in 1977	1977	South of Inspiration Point along Highway 79, about 3.2 miles se of Julian, Cuyamca mountains. Found along the east side of highway, T13S/R04E/S15.	SD

2	U	100+ in 1982	1987	Inspiration Point, along Highway 79 between Julian and Lake Cuyamaca. East of Highway 79 along road to overlook, T13S/R04E/S09, elev. 4600 ft.	SD
3	U	U	1967	5 road miles south of Julian, along Hwy 79 to Lake Cuyamaca, Cuyamaca mountains. on W-facing road bank. mapped along Highway south of Harrison Park, T13S/R04E/S22, elev. 4700 ft.	SD
4	u	5 TO 10 IN 1977	1977	3.7 MILES SOUTH OF JULIAN ALONG HWY 79 AT PINEZANITA TRAILER RANCH, CUYAMACA MOUNTAINS. MAPPED ALONG HWY 79 BETWEEN INSPIRATION POINT AND HARRISON PARK, T13S/R04E/15S, elev. 4600 ft.	SD
5	2-9	U	1951	Desert View / CNF (erroneous - correct location is at Inspiration Point south of Julian)	SD
7	U	U in 1993	1993	ALONG FIREBREAKS ON GUATAY MOUNTAIN. ASSOCIATED WITH MIMULUS CLEVELANDII AND CALAMAGROSTIS DENSA, T15S/R04E/S28, elev. 4520 ft.	SD

8	2-10	51-100 50+	1982 1994	<p>Guatay Mt., BASE OF NORTH SLOPE OF GUATAY MOUNTAIN, ABOUT 1.2 MILES EAST OF HIGHWAY 79 ON OLD HIGHWAY 80, CLEVELAND NATIONAL FOREST. PARK ON NORTH SIDE OF OLD HIGHWAY 80; PLANTS ARE ON SOUTH SIDE OF ROAD ON SLOPE ABOVE ROAD AND IN CLEARED AREA TO THE EAST. VISIBLE FROM THE ROAD WHEN IN BLOOM. MAPPED WITHIN THE SE 1/4 NW 1/4 SECTION 21 (ESTIMATED), T15S/R04E/S21, elev. 3720 ft.</p>	SD
9	U	U	1970	<p>AT SUMMIT OF OTAY MOUNTAIN, 32 DEG 35.5 MIN N LAT, 116 DEG 50.75 MIN W LONG, T18S/R01E, elev. 3600 ft.</p>	SD
10	U	U	1970	<p>DOGHOUSE JUNCTION, ABOUT 0.5 MILE NORTH OF OTAY MOUNTAIN PEAK, SAN YSIDRO MOUNTAINS. COMMON ON CLEARED SLOPE IN 1970. IN FUEL BREAK, T18S/R01E, elev. 3100 ft.</p>	SD
11	U	U	1937	<p>S FORK FEATHERSTONE CREEK, BARONA VALLEY, T14S/R01E/elev. 1350 ft.</p>	SD

13	2-6	U	1977	Palomar Mt. , LOWER DOANE V (IN PALOMAR MTN NATURAL PRESERVE)., T09S/R01E/S32, elev. 4500 ft./ CNF (erroneous -actually is C. superbus per State Parks)	SD
14	U	U	1983	WEST SLOPE OF JAPACHA PEAK, CUYAMACA RANCHO STATE PARK. FOUR COLONIES MAPPED WEST AND NORTHWEST OF SUMMIT OF JAPACHA PEAK, T14S/R04E/S19, elev. 5300 ft.	SD
15	U	U	1983	ABOUT 0.9 MILE SOUTHEAST OF OAKZANITA PEAK IN CUYAMACA RANCHO STATE PARK. THREE COLONIES FOUND IN LOW OPEN CHAPARRAL ALONG BOTH SIDES OF STATE PARK/USFS BOUNDARY, T15S/R04E/S11, elev. 5000 ft.	SD
17	U	U	1986	SOUTHERN SUMMIT OF TECATE PEAK, T18S/R03E/S29, elev. 3783 ft.	SD
18	U	Many thousands	1986	JAMUL MOUNTAINS, ABOUT 2.5 MILES SOUTH OF INDIAN SPRINGS, NORTHEAST OF OTAY RESERVOIRS. NW1/4 OF NE1/4 OF SEC 21, T17S/R01E/S21, elev. 1400 ft.	SD

19	U	Many thousands	1986	JAMUL MOUNTAINS, ABOUT 2.9 MILES SOUTH OF INDIAN SPRINGS, NORTHEAST OF OTAY RESERVOIRS. SW1/4 OF NE1/4 OF SEC 21, T17S/R01E/S21, elev. 2040 ft.	SD
20	U	Many thousands	1986	JAMUL MOUNTAINS, ABOUT 2.9 MILES SSW OF INDIAN SPRINGS, NORTHEAST OF OTAY RESERVOIRS. TWO COLONIES; ONE IN SW1/4 OF SEC 21, AND THE OTHER IN THE NW1/4 OF SEC 21, T17S/R01E/S21, elev 1700 ft	SD
22	U	Many thousands	1986	JAMUL MOUNTAINS, ABOUT 2.8 MILES SSW OF THE OAKS SCHOOL, NORTHEAST OF OTAY RESERVOIRS. NW1/4 OF NE1/4 OF SECTION 20.	SD
23	U	> 300 in 1997	1997	OTAY MOUNTAIN, ABOUT 2.75 MILES SOUTHWEST OF OTAY MOUNTAIN PEAK, JUST NORTH OF THE U.S.-MEXICAN BORDER. FROM BORDER TO ABOUT 500 METERS NORTH ON THE WEST AND NORTH SIDES OF A SMALL HILL, T18S/R01E/S34, elev. 1400 ft.	SD

24	U	5 in 1989	1989	UPPER END OF LITTLE CEDAR CANYON, ABOUT 2 MILES NORTHWEST OF OTAY MOUNTAIN PEAK, OTAY RANCH, T18S/R01E/S10, elev. 1380 ft	SD
25	U	< 500 in 1987	1987	JAMUL MOUNTAINS, ABOUT 2.5 MILES SOUTH OF THE OAKS SCHOOL, NORTHEAST OF OTAY RESERVOIRS, T17S/R01E/S17, elev. 1520 ft.	SD
26	U	U	1991	NORTH SLOPE OF SAN MIGUEL MOUNTAIN, EAST OF SWEETWATER RESERVOIR, T17S/R01W/S12, elev. 1600 ft.	SD
27	U	15-17 in 2001	2001	NNW OF MORENA RESERVOIR, 1.8 AIRMILES ENE OF LOS PINOS MOUNTAIN LOOKOUT, NNE OF CORRALCANYON FIRE STATION. 2 COLONIES ON EITHER SIDE OF KERNAN ROAD (UNIMPROVED). THIRD COLONY IN NEAR STREAM JUST TO THE NORTH. MAPPED WITHIN THE SW 1/4 OF THE SW 1/4 OF SECTION 26, T16S/R04E/S26, elev. 3500 ft.	SD

28	U	2001: 5 at Northern colony, 7 at Central colony, and 3 at Southern colony	2001	NORTHERN SLOPE OF BARBER MOUNTAIN, APPROX 1.1 AIRMILES ENE OF ELENA MOUNTAIN SUMMIT, WEST OF BARRETT LAKE. ALONG UNNAMED DIRT ROAD. 3 COLONIES MAPPED AS TWO POLYGONS BY CNNDDB, WITHIN THE E 1/2 OF THE NE 1/4 OF SECTION 18, T17S/R03E/S18, elev. 2500 ft.	SD
29	U	In 2001: 1 at Northern colony, 1 at Central colony, and 3 at Southern colony	2001	WESTERN SLOPE OF BARBER MOUNTAIN, DUE WEST OF SUMMIT, APPROX 1.1 AIRMILES ESE OF ELENA MTN SUMMIT, WEST OF BARRETT LAKE. 3 COLONIES MAPPED ALONG BARBER MOUNTAIN ROAD. WITHIN THE E 1/2 OF THE SE 1/4 OF SECTION 18, T17S/R03E/S18, elev. 2800 ft.	SD
*	2-1	U	1906	Descanso – Campo Road / CNF	SD
30	2-8	1 in 1988	1988	West Fork King Creek/CNF, SOUTHWEST SLOPE OF CUYAMACA PEAK, 0.8 AIRMILE SW OF CUYAMACA PEAK LOOKOUT, AT HEAD OF WEST FORK KING CREEK. ON SOUTH FACING SLOPE. MAPPED AT THE CENTER OF THE WESTERN EDGE OF SECTION 19T14S/R04E/S19, elev. 4960 ft	SD

*	2-2	U	1979	King Creek / CNF	SD
*	2-4	U	1980	Guatay Mtn., north slope / CNF	SD
*	2-5	U	U	Guatay Mtn. / CNF	SD
*	2-7	U	U	Morgan Hill or La Jolla Indian Resv. / (erroneous - actually is C. superbis per State Parks)	SD
27	2-11	5	2001	Morena Creek / CNF	SD
27	2-12	10-12	2001	Morena Creek / CNF	SD
29	2-13	1	2001	Barber Mt. / CNF	SD
29	2-14	5	2001	Barber Mt. / CNF	SD
28	2-15	5	2001	Barber Mt. / CNF	SD
28	2-16	3	2001	Barber Mt. / CNF	SD
29	2-17	1	2001	Barber Mt. / CNF	SD
28	2-18	7	2001	Barber Mt. / CNF	SD
3871 (UCR)	U	U	1964	Laguna Mts., Inspiration Point, near Julian, elev.4000 ft. (Minnich/UCR) Not NFS land.	SD

129356 (UCR)	U	U	1995	Guatay Mountain, from Old 80 up to top, elev. 3700-4800 ft., T15S/R4E/S21 (Elvin/UCR) CNF	SD
582812 (RSA)				Especially in openings in brush, elev. 3700-4800 ft. (Elvin/RSA)	
582818 (RSA)	U	U	1995	Cuyamaca Mountains: Inspiration Point; along road to overlook and up hill to south off Highway 79; 33° 02.520N; 116° 33.837W; T13S; R4E; S09-SE/4 of SE/4, 16- NE/4 of NE/4. Alt. 4600-4700 ft. (Elvin/RSA)	SD
78190 (RSA)	U	U	1953	Desert View, Highway 79, Cuyamaca Mountains. Alt. 4600 ft. (See CNDDDB 5 above).	SD

- U = Unknown.
- * an occurrence number has not been assigned.
- CNF = Cleveland National Forest,
- SD = San Diego County

Threats

Populations of *C. dunnii* on private lands are threatened by development and nonnative species. The proposed 2005 expansion of the “border” fence in the Otay Mesa area may have the potential to affect occurrences. Occurrences on BLM and Cleveland NF lands are threatened by unauthorized OHV use, trampling of plants while hiking cross country without the use of trails, and activities associated with border patrol activities (California Natural Diversity Database 2002). Unauthorized motorbike activity has been observed on the fuel breaks at Guatay Mountain, the largest population of *C. dunnii* on the Cleveland NF. Plants are also vulnerable to over-collecting and ground disturbance including grazing and mining while over-wintering as a bulb (USDA Forest Service 1998). Populations may also be threatened by high fire frequencies, type converting native grasslands into nonnative grasslands (Stephenson and Calcarone 1999). Plants may also be sensitive to herbicides, as observed with the

decrease in individual numbers at Otay Mountain (Sproul and Beauchamp 1979).

Other populations protected on other federal lands or state lands are in remote access areas with no threats. Two of the Cleveland NF populations, as well as others off-Forest, fall within the areas burned in the Cedar and Otay fires in fall 2003. These populations may benefit from the fires; however, fires also open up habitat temporarily to unauthorized off-road driving, which could be detrimental to the plants if not controlled.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Calochortus dunnii*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas. Pay particular attention to populations burned in the Cedar fire in 2003.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Monitor access to Guatay Mountains for unauthorized shooting, dumping, and off-road vehicle use. Create barriers where needed.
- Allow wildland fires to burn freely through *C. dunnii* habitat on Guatay Mountain (to the extent that the fire frequency does not threaten *Cupressus forbesii* populations on the mountain). Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. Use ridgelines or base of mountains for fuel break construction. The use of hand line for fuel break construction is preferred.
- Minimize the use at Guatay Mountain. Do not develop trails, campgrounds, roads, or other constructed facilities.

Evaluation of Current Situation and Threats on National Forest System Lands

Calochortus dunnii is considered to have low to moderate vulnerability on National Forest System lands due to its restricted habitat requirements to clay soils and the close proximity of a few occurrences to roads. These conditions may potentially degrade habitat as a result of erosion, soil compaction, and non-native species establishment. The occurrence on Guatay Mountain is included within the boundaries of an established Special Interest Area and a proposed Research Natural Area (RNA). Until the decision is made (within three years after the Forest Plan Record of Decision is signed) to recommend establishment or not of this RNA, the land would continue to be managed under RNA direction. Another occurrence on the Cleveland National Forest occurs within the established King Creek Research Natural Area.

The trend for this species appears to be stable on the Cleveland National Forest. The Guatay Mountain population is the largest occurrence known on the CNF. Maintenance of this population is crucial, as it

may represent the most genetically diverse occurrence on CNF due to its large size. Population genetic diversity may be essential for adaptations for possible range expansion or climatic changes. However, unauthorized motorbike activity may threaten its continued viability at this site. Creation of barriers to motorbike access would alleviate this threat. Landscape catastrophic events or activities associated with wildfire suppression, such as fuel break and hand line construction, staging areas, and introduction of invasive nonnative species may be the most significant threats to the Guatay Mountain and other occurrences. These threats from Forest Service activities may be substantial to localized populations of this plant.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	C	A

Calochortus dunnii is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Calochortus dunnii receives protection through the established management of other gabbro endemic species, such as in the King Creek RNA and other locations where gabbroic rock is found. Under all alternatives, occurrences located within the established King Creek RNA and the Guatay Special Interest Area would continue to receive protection under those designations. In Alternatives 2-6, use of Standard 33 would increase protection to the target elements when new projects are proposed within the Guatay Special Interest Area. Some areas on Guatay Mountain may occur within Wildland Urban Interface defense and threat zones under all alternatives. Alternative comparisons on NFS lands are based on the land use zoning at Guatay Mountain, the King Creek RNA area, and the Barber Mountain area.

Under Alternative 1, Guatay Mountain would remain in a Back Country land use zone. Some populations of *Calochortus dunnii* may continue to be affected by unauthorized off-road vehicle use due to the level of emphasis given to sensitive species in this alternative. Occurrences within the established King Creek RNA would also receive protection within a Critical Biological land use zone. The Barber Mountain area would be managed within a Back Country zone.

In Alternative 2, an additional level of protection would be afforded the Guatay Mountain and King Creek RNA occurrences as they would both be included within large Critical Biological land use zones. The candidate Guatay RNA is also recommended in this alternative and would be established when the Forest Plan Record of Decision is signed. The Barber Mountain area would be managed within a Back Country zone.

In Alternative 3, Guatay Mountain and King Creek RNA would be managed within large Critical Biological land use zones and the candidate Guatay RNA would become established when the Forest Plan Record of Decision is signed. The Cedar Creek Wilderness is also recommended in the King Creek Area. The Barber Mountain area would be managed as a Back Country zone.

In Alternative 4, the Guatay RNA is not recommended, nor is the Guatay Critical Biological land use zone. The King Creek area would be managed as a large Critical Biological zone. The Barber Mountain area would be managed within a Back Country zone.

In Alternative 4a, much smaller portions of the Guatay and King Creek areas would be designated as Critical Biological land use zones so fewer individuals of *Calochortus duni* would be protected within this zone. The recommendation to establish the Guatay RNA would be deferred to another decision within three years of the Record of Decision; so it is not known whether it would be established. The Barber Mountain area would be managed within a Developed Area Interface zone.

Under Alternative 5, the largest number of occurrences would be managed within the Back Country zone. Because of this, and the increased emphasis on motorized recreation in alternative 5, impacts to populations from occasional off-route vehicle use would likely increase. Greater vehicle disturbance would also increase the probability of nonnative plants affecting population occurrences. The Barber Mountain area would be managed within a Back Country zone. No Special Area designations are recommended that would further protect this taxon.

In Alternative 6, the Guatay Mountain and King Creek areas would be managed as large Critical Biological zones. The candidate Guatay Mountain RNA would become established when the Record of Decision is signed and the King Creek area would be managed as Cedar Creek recommended wilderness. The Barber Mountain area would be managed within a Back Country Non-Motorized zone.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Calochortus dunnii is restricted to clay soils chaparral and grassland habitats of San Diego County. These habitat types are unique and limited in distribution throughout San Diego County. Development, recreation use, dumping, off-road vehicle use and the latest proposal to extend the “border” fence near Otay Mesa, threaten *Calochortus dunnii* populations at locations off the Cleveland NF. There are no recorded extirpated sites. Although extant occurrences are stable in San Diego County (Reiser 1994), they are threatened by future development or potential weed invasions on private lands. *Calochortus dunnii* is low to moderately vulnerable to extinction across its range, because of its restricted habitat requirements, limited occurrences, and low population numbers observed. However, the majority of occurrences are on federal and state lands, ensuring protection from development. The greater risk to populations from unauthorized off road vehicle use under Alternative 5 combined with the fact that no Special Areas would be designated lowers the overall outcome for the species under this alternative, because approximately 60 percent of known occurrences are on National Forest System lands.

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**Calochortus clavatus var.
gracilis**

Calochortus obispoensis

Calochortus obispoensis

Calochortus obispoensis Lemmon (San Luis mariposa lily)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Calochortus obispoensis is a narrow, edaphic endemic that is found on an extensive series of ultramafic outcrops in the hills southeast and north of San Luis Valley in San Luis Obispo County extending south a short distance toward Arroyo Grande (California Natural Diversity Database 2004, Hoover 1970). Twenty-eight occurrences of *Calochortus obispoensis* are mapped in the California Natural Diversity Database (2004).

Distribution in the Planning Area

Most occurrences of *Calochortus obispoensis* are outside of National Forest System lands. One extended occurrence is in the Cuesta Ridge area of the Los Padres National Forest and a subset of this occurrence is within the Cuesta Ridge Botanical Special Interest Area. *Calochortus obispoensis* was surveyed on Cuesta Ridge Botanical Area after the Highway 41 fire (Painter 2004). *Calochortus obispoensis* is documented from Camp San Luis Obispo which abuts Los Padres National Forest and maps are available from Camp Roberts Environmental Office (Painter 2004).

Taxonomy and Natural History

Calochortus obispoensis is a monocot in the lily family (Liliaceae) and is a member of the generic section Cyclobothra (Ownbey 1940).

Calochortus obispoensis is a perennial herb from an underground, fibrous-coated bulb that annually

produces a slender, erect, branched stem that supports 2 to several flowers. Flowers bloom from May to June, sometimes into July, the petals of which are most distinctive due to their long, narrow sepals, yellow petals with long hairs on the surface. Fiedler (1987) states that for the *Calochortus* spp. in her study, all of them produced solitary bulbils in the lowermost cauline leaf axils or bulblets from the mother bulb or both, but does not state specifically which is the case for *Calochortus obispoensis*.

Calochortus obispoensis is self-incompatible and pollination is primarily by Hymenopterans and/or Coleopterans (Fiedler 1987). Capsules mature in the summer and seeds are shed the following fall or winter where they germinate shortly after the onset of winter rains (Fiedler 1987). The bulbs are typically dormant from July to October but some individuals may remain dormant much longer. Not every individual bulb produces flowers each and every year and only a minor proportion of the plants that produce inflorescences produce viable seed (Fiedler 1987). Of the viable seed that is produced, the majority are killed by unknown causes (Fiedler 1987). Because nearly ever surviving seed produced in a give year germinates, *Calochortus obispoensis* is dependent on an annually renewed seed bank and on its bulb bank. Individual bulbs may live ten years or more (Fiedler 1987).

Grazing of basal leaves by native generalist herbivores was severe in one study of *Calochortus obispoensis* near Cal Poly, San Luis Obispo (Fiedler 1987).

Calochortus obispoensis appears to have an 'endure' life history strategy for coping with wildfire. When wildfire occurs, the current year's crop of stems, flowers, fruits, and seeds are generally consumed by fire resulting in a loss of one year's reproductive output. However, the affected plants typically live, the plant's bulbs being sufficiently deep in the soil to survive most fire events. In response to post-fire environmental cues, most populations of *Calochortus* respond the year after a wildfire event with higher than usual percentages of plants producing flowering stems. This results in increased reproductive output and the dispersal of seeds into an environment that, for a short period of time, will produce less competition from neighboring plants.

Habitat Description

Calochortus obispoensis generally grows on open, dry ultramafic soils in chaparral, coastal scrub, and serpentine grassland (California Native Plant Society 2001). Native perennial bunchgrasses and other bulbous perennials are frequent associates (Fiedler 1987). Hoover (1970) indicates that *Calochortus obispoensis* is also found growing on sandstone at the south end of the taxon's range.

Occurrence Status

Of the twenty-eight occurrences of *Calochortus obispoensis* (California Natural Diversity Database 2004), there are reports of population sizes ranging from less than 50 to about 10,000. Many of the occurrences number in the hundreds. On Cuesta Ridge, *Calochortus obispoensis* is present on many acres of land and the population size is estimated to be at least 1,000 plants.

OCCURRENCE DATA – *Calochortus obispoensis*(San Luis Mariposa Lily)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	44 in 1983, 100 + in 1984, 600 in 1988, 100's in 1998, 100 in 2003	2003	CUESTA RIDGE, ABOUT 1-4 MILES WNW OF CUESTA PASS ALONG FIREBREAK, NORTH OF SAN LUIS OBISPO. MAPPED ALONG RIDGE FROM SE 1/4 CORNER OF SECTION 35 NORTH AND WEST TO THE E 1/2 SECTION 28. INCLUDES PORTIONS OF NE 1/4 SECTION 34 AND SW 1/4 SECTION 27.	SLO
2	240 in 1983	1983	CUESTA RIDGE, ABOUT 0.8 MILE WEST OF CUESTA PASS, NORTH OF SAN LUIS OBISPO. ALONG ROADS ON RIDGETOP DUE WEST OF CUESTA PASS. MAPPED AS FOUR POLYGONS, T30S/R12E/S01	SLO
3	U	1939	HILL 1 MILE NORTH OF SAN LUIS OBISPO ALONG HIGHWAY 101. SE-FACING SLOPE OF HILL. EXACT LOCATION NOT KNOWN; SITE MAPPED ALONG HWY 101 ABOUT 1-2 MILES NORTHEAST OF JUNCTION WITH HIGHWAY 1. M. MCLEOD SUGGESTS THIS SITE IS NORTH OF HWY 101 OPPOSITE RESERVOIR CANYON, T30S/R12E/S24	SLO

4	200-300 in 1988	1988	RIDGE ABOUT 1 MILE NORTH OF CAL POLY SAN LUIS OBISPO AND WEST OF POLY CANYON (BRIZZIOLARI CREEK), SAN LUIS OBISPO. ON SPUR OF CUESTA RIDGE ABOVE CAL POLY CAMPUS ACROSS FROM YUCCA FOREST TRAIL AND ABOVE THE HORSE UNIT, T30S/R12E/S14	SLO
5	2500 in 1991	2001	IRISH HILLS ALONG PREFUMO CANYON ROAD NEAR HEAD OF COOK CREEK, SOUTHWEST OF SAN LUIS OBISPO. TOP OF PERFUMO CANYON ROAD JUST BEFORE TURN, ON A ROCKY KNOLL THAT PROJECTS TO THE NORTH. MAPPED WITHIN THE N 1/2 OF THE SW 1/4 SECTION 2.	SLO
6	U	1969	CHORRO CREEK CANYON (SERRANO CANYON), NORTH OF SAN LUIS OBISPO. EXACT LOCATION NOT KNOWN; MAPPED ALONG ENTIRE CANYON, T30S/R12E/S03	SLO
8	U	1946	SUMMIT AT HEAD OF CARPENTER CANYON, NORTH OF ARROYO GRANDE, T32S/R13E	SLO

9	5 in 1995	1995	MOUTH OF CANYON NO.1 NEAR GROVER CITY, NORTH OF ARROYO GRANDE. NORTH END OF PROPOSED LOS ROBLES DEL MAR DEVELOPMENT; WEST OF OAK PARK BLVD AT JUNCTION WITH NOYES ROAD, T32S/R13E/ S17	SLO
10	100's in 1988	1988	PENNINGTON CREEK ABOUT 1 MILE WEST OF WHISKEY SPRING, NORTH OF SAN LUIS OBISPO. MAPPED WITHIN THE SW 1/4 NE 1/4 AND S 1/2 NW 1/4 SECTION 23 AND ALSO IN THE NE 1/4 SE 1/4 SECTION 31. MAPPED AS FOUR POLYGONS, T29S/R12E/S32	SLO
11	< 50 in 1984, 35 in 1988	1988	MOUTH OF RESERVOIR CANYON ABOUT 0.5 MILE SOUTH OF HIGHWAY 101, EAST OF SAN LUIS OBISPO. ON AND ABOVE (NORTH OF) OLD ROAD CUT, T30S/R13E/S30	SLO
12	10+ to 50+	1984	UPPER POLY CANYON ALONG BRIZZIOLARI CREEK, ABOUT 0.6 MILE NORTHEAST OF CAL POLY SAN LUIS OBISPO CAMPUS, SAN LUIS OBISPO. ALONG ROADS AND TRAIL ON BOTH SIDES OF BRIZZIOLARI CREEK. THREE COLONIES MAPPED NEAR THE MIDDLE OF THE E 1/2 SE 1/4 SECTION 14.	SLO
13	U	1988	BEHIND (EAST OF) SAN LUIS OBISPO HIGH SCHOOL, SAN LUIS OBISPO, T30S/R12E/S25	SLO

14	U	1984	SERRANO CREEK (MAPPED NEAR SERRANO), NORTH OF SAN LUIS OBISPO. UNABLE TO LOCATE SERRANO CREEK; SITE MAPPED NEAR SERRANO STATION, T30S/R12E/S11	SLO
15	1000 in 1985, 1200 in 1988	1988	HILL EAST OF SOUTH HIGUERA STREET NEAR CEMETERIES, SAN LUIS OBISPO. MAPPED JUST EAST OF SOUTH HIGUERA ROAD AT JUNCTION WITH ELKS ROAD, T31S/R12E/S03	SLO
16	> 50 in 1985, 70 in 1988	1988	RIDGE ABOUT 0.4 MILE WEST OF BROAD STREET AT JUNCTION WITH ORCUTT ROAD, SAN LUIS OBISPO, SERPENTINE RIDGE, ABOVE ROAD TO RESERVOIR. MAPPED WITHIN THE SW 1/4 NE 1/4 SECTION 2, T31S/R12E/S02	SLO
17	U	1980	WESTERN RIDGE OF INDIAN KNOB, ABOUT 4 MILES NORTH OF PISMO BEACH. MAPPED ALONG RIDGETOP WEST OF INDIAN KNOB, ALONG ROAD JUST NORTH OF 859' BENCHMARK, T31S/R12E/S26	SLO
18	200-400 in 1988	1988	FROOM RANCH, ABOUT 0.5 MILE WSW OF LOS OSOS VALLEY ROAD AT HIGHWAY 101, JUST SW OF SAN LUIS OBISPO CITY LIMITS. TWO COLONIES MAPPED ALONG THE SOUTHERN BRANCH OF FROOM CREEK ALONG LOWER SLOPES OF MINE HILL, T31S/R12E/S09	SLO

19	50 in 1987	1987	ABOUT 1.5 MILES EAST OF BIDDLE RANCH ROAD (ORCUTT ROAD), NORTH OF EAST CORRAL DE PIEDRA CREEK AND SE OF SAN LUIS OBISPO. ON WEST FACING SLOPE DUE EAST OF RAYMOND BALL HOUSE. MAPPED ALONG RIDGE BETWEEN EAST CORRAL DE PIEDRA CREEK AND SOUTH BRANCH OF WEST CORRAL DE PIEDRA CREEK, T31S/R13E/S15	SLO
20	10,000's in 1992	1992	RIDGE WEST OF WEST CORRAL DE PIEDRA CREEK, ABOUT 3 MILES NORTHEAST OF SAN LUIS OBISPO. ALONG 1 MILE SECTION OF RIDGELINE, OPPOSITE THE MOUTH OF OIL WELL CANYON. OCCURRENCE RUNS THROUGH SEC 4, FROM NW TO SE, T31S/R04	SLO
21	16 in 1987	1987	ABOUT 0.5 MILE EAST OF HIGHWAY 101 AND 1.4 MILE SOUTHWEST OF MT. LOWE, NORTH OF SAN LUIS OBISPO. ALONG ROCKY SERPENTINE RIDGE WITHIN THE SE 1/4 NE 1/4 SECTION 19 AND THE SW 1/4 NW 1/4 SECTION 20, T30S/R13E/S20	SLO

22	300	1988	HILLSIDE EAST OF LAGUNA LAKE IN LAGUNA LAKE PARK, NORTH OF MADONNA ROAD, SAN LUIS OBISPO. 150-250 YARDS FROM PARKING LOT UP FROM ELECTRICAL TOWER ON HILLSIDE; ACROSS FROM EUCALYPTUS IN PARK, T30S/R12E/S34	SLO
23	10 in 1995	1995	CAMP SAN LUIS OBISPO, RIDGE NORTHWEST OF CHORRO RESERVOIR, NORTH OF SAN LUIS OBISPO. MAP DETAIL NOT PROVIDED FOR THIS SITE. OCCURRENCE MAPPED AT CNDDDB BASED UPON GENERAL DIRECTIONS AND THE FOLLOWING UTM COORDINATES: E709900 N3913300, T30S/R12E/S04	SLO
24	1000 in 1995	1995	CAMP SAN LUIS OBISPO, UPPER CHORRO CREEK RESERVOIR NEAR SPRINGS AND MINING SITES, NORTH OF SAN LUIS OBISPO. MAP DETAIL NOT PROVIDED FOR THIS SITE. OCCURRENCE MAPPED AT CNDDDB BASED UPON GENERAL DIRECTIONS AND THE FOLLOWING UTM COORDINATES: 709800E 3914900N, T29S/R12E/S33	SLO

25	100's in 1992	1992	UPPER STENNER CREEK ALONG AQUEDUCT, ABOUT 0.6 MILE SOUTHWEST OF SOUTH PORTAL OF CUESTA TUNNEL, NORTH OF SAN LUIS OBISPO. ALONG DIRT ROAD AND ON SLOPE ABOVE ROAD ABOUT 1 AIR MILE EAST OF CAMP SLO NATIONAL GUARD RESERVATION BOUNDARY, T30S/R12E/S02	SLO
26	200 in 1993, 3 in 1998	1998	UPPER STENNER CREEK JUST SOUTHWEST OF SOUTH PORTAL OF CUESTA TUNNEL, NORTH OF SAN LUIS OBISPO. ABOUT 400 FEET SOUTHWEST OF THE TUNNEL, ABOUT 0.3 MILE NORTHEAST OF RR TRACKS, T30SR12E/S02	SLO
27	< 25 in 1989	1989	NEAR SPRING SOUTH OF CAMBRIA MINE, ABOUT 1 MILE SSE OF RED MOUNTAIN, NORTH OF CAMBRIA. STEEP HILL SOUTH OF SPRING THAT EMERGES ON A FLAT WEST OF SAN SIMEON CREEK RANCH ROAD, NEAR A PATCH OF QUERCUS AGRIFOLIA AND PINUS SABINIANA, NEAR THE MIDDLE OF THE EASTERN PROPERTY BOUNDARY. MAPPED WITHIN SW 1/4 NW 1/4 SECTION 36.	SLO
28	U	1999	ALONG STENNER CREEK ROAD, ABOUT 0.5 MILE EAST OF RAILROAD TRESTLE, NORTH OF SAN LUIS OBISPO, T30S/R12E/S10	SLO

29	U	2003	SEE CANYON, APPROXIMATELY 0.7 AIRMILE SOUTHWEST OF HEADWATERS OF FROOM CREEK. TWO COLONIES MAPPED PRIMARILY IN THE NORTHEAST 1/4 OF SECTION 13.	SLO
752 (SBBG)	U	U	Cuesta Ridge (Ayers, et. al./ SBBG)	SLO
4074 (SBBG)	U	U	Cuesta Ridge (Junak/SBBG)	SLO
4078 (SBBG)	U	U	Cuesta Ridge (Junak/SBBG)	SLO
8354 (OBI)	U	U	Cuesta Ridge (Rodin/ SBBG)	SLO

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SLO= San Luis Obispo County*

Threats

Calochortus obispoensis is threatened by grazing, land development, road construction, recreation, and potentially by mining (California Native Plant Society 2001). Fiedler (1996) reported that recent research on the population biology of *Calochortus obispoensis* suggests that some populations may be declining. Except for recreation, these threats apply only to occurrences on private land. On the Los Padres National Forest, occurrences of *Calochortus obispoensis* are affected by recreation (shooting, bicycle riding, dispersed hiking and picnicking), trespass activities associated with recreation; i.e., vehicles traveling off of designated routes, and by the spread of invasive nonnative plants. Fuelbreak maintenance is not a current threat but future projects may come forward to propose fuel modification treatments on Cuesta Ridge. The construction of the Cuesta Ridge communication site and access road appears to have removed habitat for *Calochortus obispoensis* and future proposals for communication or utility corridors could also affect habitat for this lily.

Five occurrences of *Calochortus obispoensis* outside the national forest are within a city/county bioreserves (Havlick, personal communication), and several occurrences are on land owned by California State Polytechnic University, San Luis Obispo (California Natural Diversity Database 2004).

Threats and possible threats at Camp San Luis Obispo (Painter 2004) include cattle, feral pigs, non-native plants, military training activities, mines and tailings reclamation projects, erosion, too frequent

fires, fires in wrong season, fuel modification treatments, dust, road maintenance, trespassing bicyclists, trampling, soil compaction, and proposed pipeline construction.

Conservation and Management Considerations

Calochortus obispoensis is similar to many of its congeners in important ecological characters and its rarity relative to the widespread distribution of related *Calochortus* sp. such as *Calochortus pulchellus* is due to its being specifically adapted to a rare habitat type. Because of the limited availability of the habitat type that *Calochortus obispoensis* is dependent upon it is important to conserve all available habitat on NFS land. To better manage this rare plant and its rare habitat it is important to obtain better data regarding the actual distribution and abundance of *Calochortus obispoensis* on National Forest System (NFS) land. Once plants are located and mapped they should be monitored to determine their demography as well as the effects of road and trail use. It is also important to obtain and process information regarding the degree and consequences of herbivory by native vertebrates.

Evaluation of Current Situation and Threats on National Forest System Lands

Calochortus obispoensis is uncommon on NFS land; it is a narrow endemic restricted to a small portion of San Luis Obispo County; and its current distribution on NFS land is affected by dispersed recreation, road use and maintenance, invasive non-native plants, communication site management, and potentially by fuels management.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome Statements For National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Calochortus obispoensis is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Under alternatives 1, 2, 3, 4, 4a and 6, habitat for *Calochortus obispoensis* would be of sufficient

quality, distribution, and abundance to allow the species population to remain stable or stabilize, well distributed across NFS land. Under all alternatives, known occurrences of *Calochortus obispoensis* would be located in a Back Country land use zone with 2 small exceptions. In Alternative 6, one patch of *Calochortus obispoensis* habitat would be located in the Developed Area Interface land use zone. In Alternative 4a, along West Cuesta, the zoning would change from Back Country to Back Country Motorized Use Restricted; this would benefit this lily.

Under all alternatives, about three quarters of the habitat for *Calochortus obispoensis* that is found on National Forest System lands would be within the Cuesta Ridge Botanical Special Interest Area (SIA) and this designation would provide substantial protection for the plants found within the SIA. Increased protection of the target elements of the SIA would occur with the use of Standard S33 in alternatives 2-6. In addition, the increased emphasis on management of dispersed recreation activities in Alternative 4a may mitigate many of the impacts associated with this use. Under Alternative 5, increased emphasis on motor vehicle based recreation would likely result in higher use and impacts in occupied habitats found outside of the SIA. Both authorized and unauthorized uses would degrade habitat. This higher use, in combination with vegetation management projects to reduce fuels, could fragment habitat and impact pollinator habitat. In addition, any increase in motorized road or trail densities in occupied habitat would result in further habitat loss under Alternative 5. Habitat for *Calochortus obispoensis* would be isolated relative to historic distribution.

Viability Outcome Statements for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

The combination of environmental (habitat) and population conditions allows the species population to remain stable or stabilize, but with significant gaps in the historic species distribution. These gaps are due to habitat loss resulting from urbanization and these gaps cause some limitations in interactions among populations. Stability in the distribution of *Calochortus obispoensis* is due in part to protection afforded occurrences on land managed by the City of San Luis Obispo and by the California State Polytechnic University, San Luis Obispo.

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Calochortus dunnii

**Calochortus palmeri var.
munzii**

Calochortus palmeri var. munzii

Calochortus palmeri S. Watson var. *munzii* F. Ownbey (Munz's mariposa lily)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2T1; S1.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Calochortus palmeri var. *munzii* is endemic to the San Jacinto Mountains. Only four of the documented occurrences are in California Natural Diversity Database (2004), one of which is on private land in the Idyllwild area (occ. no. 1).

Distribution in the Planning Area

Multiple occurrences are known from the San Jacinto Ranger District of the San Bernardino National Forest. Occurrences are generally distributed through the central and southern San Jacinto Mountains from Idyllwild to Keenwild, south through Garner Valley and the Thomas Mountain area to the junction of the PCT and Highway 74.

Taxonomy and Natural History

Calochortus palmeri var. *munzii* is a monocotyledonous perennial plant in the lily family (Liliaceae). It is one of two varieties of *Calochortus palmeri*. The base of the plant does not bear bulblets, and the taxon has a straight, generally branched stem 30-60 cm long. The leaves are basal and withering and are generally 10-20 cm long. The inflorescence of *Calochortus palmeri* var. *munzii* contains 1-6 erect flowers with paired pedicels and opposite bracts 1-2 cm long. The perianth is widely bell-shaped, with sepals that are more or less 30 mm long and generally are brown-spotted near the base. Petals are white to lavender, 20-30 mm long, and are sometimes brown-spotted above the more or less round nectary. Nectaries are glabrous or purple-hairy. Fruits are erect, linear and angled and are generally 5 cm long.

Flowering occurs in June (Munz 1974, Fiedler & Ness 1993)

Calochortus palmeri var. *munzii* can be distinguished from *C. palmeri* var. *palmeri* by the absence of bulblets at the base of the stem, bract orientation, and flower color (Fiedler & Ness 1993).

Habitat Description

Calochortus palmeri var. *munzii* occurs in meadows, seeps, and vernal moist places in lower montane coniferous forests and chaparral at elevations of 3,900–7,200 feet (1,200–2,200 meters) (California Natural Diversity Database 2004). Dudek and Associates (1999) state that “plants occur on exposed knolls in either shaded, yellow pine woodland, on seasonally moist, fine loams, chaparral on moist, sandy clay soils, or native grassland.”

Occurrence Status

There are several collections from the San Jacinto Mountains that lack specific location information sufficient to know whether these occurrences are on the SBNF. Field work is needed.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Calochortus palmeri* var. *munzii* (Munz's mariposa lily)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1		1910, 1967, 199X	Vicinity of Idyllwild, Alderwood and Pine Crest Roads. Was growing in vacant lot on gentle slope in full sun, now extirpated (Elvin/RSA). PVT	RIV
2		1966	Below Alvin Meadow, along old Control Road southwest or southeast of meadow. SBNF	RIV

4	U	1940	NEAR HURKEY CREEK, PALMS TO PINES HIGHWAY. SAN JACINTO MNTS. ONLY SOURCE OF INFORMATION FOR THIS SITE IS 1940 COLLECTION BY DEARING. NEEDS FIELDWORK.	RIV
5	U	1940	WEST OF RIBBONWOOD, PINES TO PALMS HWY. SAN JACINTO MNTS.	RIV
*(RSA)	U	1995	San Jacinto Mountains, Garner Valley, N of Morris Creek. Cobbley soils, native grassland on slight rise. w/ <i>Arabis johnstonii</i> . (Hirshberg). SBNF.	RIV
*(RSA)	25 in bloom, more vegetative	1995	San Jacinto Mountains. Elev. 4750'. Near 33 44 523 N 116 45 500 W. Fine granitic damp loam. Full sun. Flat. In moist mountain meadow. w/ <i>Madia</i> cf. <i>elegans</i> , <i>Bloomeria crocea</i> , <i>Lupinus bicolor</i> , <i>Sidalcea</i> cf. <i>malviflora</i> , <i>Dichelostemma congestum</i> , <i>Pinus</i> cf. <i>ponderosa</i> , <i>Arctostaphylos</i> cf. <i>pringlei</i> . Plants more common on meadow edge. (Mistretta). U.	RIV
*(RSA)	U	1995	San Jacinto Mountains, Hwy 74. 4150' and 4650'. Coarse dry granite loam, full sun, slight W slope. Associated w/ <i>Eriogonum fasciculatum</i> , <i>Bromus tectorum</i> , <i>Ceanothus leucodermis</i> , <i>C. greggii vestitus</i> , <i>Arctostaphylos pringlei</i> . U.	RIV

*(RSA)	U	1995	San Jacinto Mountains: Hwy 74 and Pacific Crest Trail. 4900'. Fine granitic loam, full sun, flat, dry. Site recently burned. w/ <i>Quercus</i> cf. <i>john tuckeri</i> , <i>Artemesia ludoviciana</i> , <i>Malacothamnus</i> cf. <i>fasciculatus</i> , <i>Gutierrezia</i> , <i>Lasthenia</i> cf. <i>californica</i> , <i>Poa secunda</i> . SBNF.	RIV
*(RSA)	~250	1995	San Jacinto Mountains: Garner Valley, off Fobes Ranch Road. 4510'. Yellow pine woodland. Highly localized on isolated raised clay knoll. Flat. Full sun. Dry. w/ <i>Echinocereus engelmannii</i> , <i>Allium parryi</i> , <i>Opuntia</i> sp., introduced annual grasses. U.	RIV
*(RSA)	~500	1995	San Jacinto Mountains: Mountain Center; along both sides of Hwy 74 at mi. 60.0. Chaparral. Full sun. Moist. Flat. w/ <i>Eriogonum fasciculatum</i> , <i>Ceanothus greggii</i> var. <i>vestitus</i> , <i>Bloomeria crocea</i> , <i>Poa secunda</i> , <i>Bromus tectorum</i> , <i>Lupinus bicolor</i> . U.	RIV
*(RSA)	U	1950	2 mi. NW of Pipe Creek, S end of San Jacinto Mtns. 4600'. U.	RIV
*(RSA)	1000	U	Hwy 74, Mile 70. In adjacent ditch and meadows. (Elvin) U.	RIV
122530 (UCR)	U	2001	Morris Ranch Rd., 2.1 mi. NE of CA-74 (Helmkamp/UCR)	RIV

127537 (UCR)	U	2003	Garner Valley, foothills on the NE side of the valley, ½ mi. W of Morris Ranch Rd. on a dirt track ,ca.1 km W of Goff Flat, T6S/R4E/S19 (Sanders/UCR)	RIV
137356 (UCR)	U	1998	Pine Meadow in the eastern Garner Valley, R-Ranch, just E of Hwy 74, between Gold Hill and Thomas Mtn., T7S/R4E (Wear/UCR)	RIV
139247 (UCR)	U	2003	Garner Valley, foothills on the NE side of the valley, near Morris Ranch Rd. ca. 0.25 mi. of Kenworthy Ranger Station (Sanders/UCR)	RIV
139248 (UCR)	U	2003	Garner Valley, SW side of the valley, foot of Thomas Mtn., W of Hwy 74 on S side of Ramona Truck Trail (Sanders/UCR)	RIV

- *U* = *Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF* = *San Bernardino National Forest*
- *RSA* = *Rancho Santa Ana*
- *RIV* = *Riverside County*

Threats

Calochortus palmeri var. *munzii* may be affected by grazing on SBNF lands in the San Jacinto Mountains. Other threats to the taxon on NFS lands include hydrological developments and alterations, dispersed recreation, and non-native species invasion. Occurrences found along roads may be affected by road work or maintenance activities (Dudek & Associates 1999). In Developed Area Interface zones, habitat may be affected by future proposed fuel treatments on NFS lands. Suitable habitat on the SBNF is narrowly distributed and relatively well-protected from a variety of Forest uses but would be affected by the same activities listed above. Recent land acquisitions in the Garner Valley area may have increased ownership of occupied or suitable habitat on NFS lands however this could not be verified at the time of this analysis.

Conservation and Management Considerations

The primary conservation strategy for *Calochortus palmeri* var. *munzii* is to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Survey all new occurrences of *Calochortus palmeri* var. *munzii* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Calochortus palmeri* var. *munzii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Calochortus palmeri* var. *munzii* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Calochortus palmeri var. *munzii* is a locally-common narrow endemic species known only to occur in the San Jacinto Mountains, primarily in mesic or meadowy areas, native grasslands and in shaded yellow pine woodland on seasonally moist soils. These areas are generally not well protected from threats identified above.

Based on the above analysis, *Calochortus palmeri* var. *munzii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	B	A

Calochortus palmeri var. *munzii* is a USDA Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Because this species occurs in a heavily utilized area of the SBNF and within areas of Developed Area

Interface, threats will persist under all alternatives. The viability of this species is tied to protection and management of meadow habitats. With implementation of the standards for riparian areas, viability for this species on NFS lands is secure. Under Alternative 1, use of the SCCS Riparian Strategy would be retained. In alternatives 2-6, consideration of the Suitable Use restricting motorized and mechanized vehicle travel to Forest System roads and designated trails, along with Standards regarding sensitive species, vegetation, recreation and grazing management, factor into the following outcomes:

In the Garner Valley area, under Alternatives 1, 2, 4, and 5, habitat would be zoned Developed Area Interface and Back Country; this would not provide any increased protection for this species. Under Alternative 4a, the area is zoned as stated for alternatives above with some Back Country Motorized Use Restricted zoning. Under Alternatives 3 and 6, expanded Back Country Non-Motorized zoning in the Garner Valley area and the recommended Garner Valley Special Interest Area would provide added protection. Under Alternative 3, recommended wilderness zoning would provide increased protection. In locations affected by grazing, the largest numbers of suitable grazing acres would be retained in Alternatives 1, 5, 2, 4a, 4, 3 and 6 respectively. Grazing within riparian areas would be reduced to the greatest extent in Alternatives 3 and 6, then 4 and 4a, then 2, then 5 and then 1 respectively.

In the Mountain Center area, Alternatives 1, 2, 4, and 5 would be zoned Developed Area Interface and Back Country. Under Alternative 4a, habitat is zoned mostly Back Country with an increase in Back Country Non-Motorized zoning. Alternative 3 would add protection in locations recommended for wilderness, and alternative 6 would increase protection through an increase in Back Country Non-Motorized zoning. Alternatives 3 and 6 would also benefit from the recommended Garner Valley SIA when new projects are proposed using Standard S33.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

The private lands of Garner Valley have been reduced by residential and ranchette development. The remaining private lands continue to be lost as continued development occurs. While it is presumed that this species continues to lose habitat to private land development, this loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF.

By maintaining the current distribution of the *Calochortus palmeri* var. *munzii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause the *Calochortus palmeri* var. *munzii* to suffer a decline in its overall distribution.

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Calochortus obispoensis

Calochortus palmeri var.
palmeri

Calochortus palmeri var. palmeri

Calochortus palmeri Watson var. *palmeri* (Palmer's mariposa lily)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2T2, S2.1 – very threatened (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Calochortus palmeri var. *palmeri* is sparsely distributed across central and southern California from the Tehachapi Mountains and the La Panza Range south to the San Rafael, San Gabriel, San Bernardino, San Jacinto, and Santa Rosa mountains (Keator 1993, California Natural Diversity Database 2002). The California Natural Diversity Database (2004) reports 33 occurrences of *Calochortus palmeri* var. *palmeri*. Although some of these are outside of National Forest System lands; at least twenty four occurrences appear to occur within the San Bernardino, Angeles, and Los Padres National Forests (Stephenson and Calcarone 1999, California Natural Diversity Database 2004).

Distribution in the Planning Area

On the Angeles National Forest, *Calochortus palmeri* var. *palmeri* has been found near Angeles Crest Highway opposite the trail to Devil's Canyon, in Mystic Canyon, the Charlton Flats area, and in the South Fork of Little Rock Creek in the Pinyon Flats area.

On the Los Padres National Forest, *Calochortus palmeri* var. *palmeri* has been confirmed to occur in the Sespe watershed near Chorro Grande Trail and on the north slope of Frazier Mountain near the Chuchupate Ranger Station. There are also reports that it occurs in eastern Lockwood Valley, along Derrydale Creek (Occurrence #15), above Juncal Dam in the Santa Ynez watershed, in the American Canyon watershed of the La Panza Range (Occurrence #14), along Mariana Creek near Pozo Summit, also in the La Panza Range (Occurrence #13), and above Manzana Creek (elevation 3,800 feet) on the

White Ledge Trail in the San Rafael Mountains (Occurrence #16) (California Natural Diversity Database 2002, Smith 1998). However, these reports have not been confirmed by recent field visits. In 2001, an occurrence of *Calochortus palmeri* var. *palmeri* was discovered on Alamo Mountain in the Piru Creek watershed (Burgess, pers. comm. 2003).

On the San Bernardino National Forest, occurrences are known from the Baldwin Lake and Big Bear Lake area, Tent Peg Campground, 1N17 OHV Trail, Little Pine Flat and Hawes Ranch areas, Willow Creek, Kinley Creek, and the Rock Camp area and several other locations within this range. The upper Lytle Creek Divide occurrence may also occur on NFS lands (107055 UCR). The Santa Rosa Mountain occurrences are in question due to the fact that the 1901 and 1941 are the most recent vouchers from this location. These may be *Calochortus palmeri* var. *munzii* however there are currently no vouchers for that location.

Taxonomy and Natural History

Calochortus palmeri var. *palmeri* is a monocot in the lily family (Liliaceae). *Calochortus palmeri* is separated into two varieties (*C. palmeri* var. *munzii* and *C. palmeri* var. *palmeri*) based on differences in their nectaries, the presence of bulblets, and whether the bracts are alternate or opposite (Keator 1993). The ranges of these two varieties overlap, and plants in the San Jacinto and Santa Rosa mountains may prove to be *C. palmeri* var. *munzii* (Lardner and others 1998).

Calochortus palmeri var. *palmeri* is a slender, branched perennial, 12-24 inches (30-60 cm) high, with bulblets at the base of the plant. The basal leaves are 4-8 inches (10-20 cm) long and eventually wither away. The inflorescence bears 1-6 flowers that bloom from May to July. The perianth is bell shaped with brown spotted sepals and white to lavender petals, 8-12 inches (20-30 mm) long. The nectary is yellow-hairy.

Calochortus palmeri var. *palmeri* appears to have an 'endurer' life history strategy for coping with wildfire. When wildfire occurs, the current year's crop of stems, flowers, fruits, and seeds are generally consumed by fire resulting in a loss of one year's reproductive output. However, the affected plants typically live, the plant's bulbs being sufficiently deep in the soil to survive most fire events. In response to post-fire environmental cues, most populations of *Calochortus* respond the year after a wildfire event with higher than usual percentages of plants producing flowering stems. This results in increased reproductive output and the dispersal of seeds into an environment that for a short period of time will produce less competition from neighboring plants. Reductions in surface leaf litter may also provide better habitat for seedlings. Presumably, this reduction in competition and improvement in habitat provides germinating seeds an environment that is more likely to result in the successful recruitment of new plants into the population.

On the SBNF, numerous locations of occupied habitat burned or were located within unburned islands within the 1999 Willow Fire. Fire intensity ranged from unburned to medium; however, most occurrences were located in areas that burned with low fire intensity. Many of the occurrences were

found within dozer lines. Nonnative grass, *Bromus tectorum*, was present near most of the occurrences surveyed after the fire. Because population numbers were not known prior to the fire, post fire numbers could not be compared however CNNDDB field forms indicate that individuals were most plentiful in the second year after the fire. It is not known if this is due to timing of surveys, rainfall amounts, extent of surveys, or other factors (Kopp, pers. observations 2005).

Habitat Description

Calochortus palmeri var. *palmeri* occurs in meadows, seeps, and vernal moist areas in chaparral, mixed conifer forest, and yellow pine forest at elevations of 3,300-7,200 feet (1,000–2,200 meters) (Keator 1993, Stephenson and Calcarone 1999). Hoover (1970) describes habitat for *Calochortus palmeri* var. *palmeri* as being "along streamlets where soil is wet during growing season but drying in summer." Habitat near Chuchupate Ranger Station consists of the lower end of a small, moderately steep, moist meadow, with a moderate cover of grass and rush and a dense layer of leaf litter about 6-8 inches deep.

Occurrence Status

On the Los Padres National Forest, counts of flowering plants found near Chuchupate Ranger Station, were conducted in 1998 (30 plants), 2000 (140 plants), and in 2002 (92 plants). In 2003, an apparent banner year for the species, over 1,200 flowering plants were counted. The variation in the number of plants observed is probably due to annual variations in the number of plants that produce flowering stems rather than due to increases or decreases in the total number of plants. The same person using the same methodology conducted all of these counts. Two newly discovered occurrences of *Calochortus palmeri* var. *palmeri* in and near Godwin Canyon consisted of over 2,000 plants (Austin pers. comm. 2003).

On the San Bernardino National Forest, two new occurrences were discovered in 2004. One occurrence is located in the Maloney Canyon and Stove Flats area, half a mile south of Squint’s Ranch. This area was burned in 2003 in the Old Fire. Approximately 7,000 individuals were found in this area. The second occurrence is located in Grout Creek, north of Gray’s Peak, approximately 1 ½ miles north of Highway 38. Approximately 60 individuals were found at this location (USDA Forest Service 2005).

OCCURRENCE DATA – *Calochortus palmeri* var. *palmeri* (Palmer's mariposa lily)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

2	6 to 10	1982	WEST OF ANGELES CREST HIGHWAY NEAR OLD CAMP. AT MILEPOST 50.50 OPPOSITE THE DEVIL'S CANYON TRAILHEAD. IN AND ALONG STREAMBED FROM HIGHWAY TO CAMPGROUND ROAD, T03N/R11W/S23. ANF	LA
3	U	1935	HORSETHIEF CANYON, 1000M (3280') ELEVATION. MAPPED SOUTH OF HWY 138 NEAR CONFLUENCE WITH LITTLE HORSETHIEF CANYON, T03N/R05W/S25. PVT.	SBD
4	3 in 2000, 14 at NW colony, 1 at central, 30 at SW colony	2001	MALONEY CANYON, 0.9 AIR MILE SOUTHWEST OF SQUINTS RANCH, NORTH OF LAKE ARROWHEAD. ALONG SMALL DRY DRAINAGE ALONG ROAD 3N34 (WILLOW CREEK TRAIL) 0.4 MILE SOUTHEAST OF BLOCKED OFF 4WD ROAD TO MALONEY CANYON. ON SOUTH SIDE OF ROAD 3N34. MAPPED WITHIN THE S1/2 OF SECTION 35, AND THE NE 1/4 OF THE NE 1/4 OF SECTION 2. SBNF.	SBD

5	30-40 in 1994	1994	GROUT BAY PICNIC AREA ALONG HIGHWAY 38, NORTH SHORE OF BIG BEAR LAKE NEAR FAWNSKIN. PICNIC AREA IS NEAR THE CAMPGROUND ON THE WEST SIDE OF THE BAY. WITHIN THE NE 1/4 OF THE NE 1/4 OF SECTION 14. POP. IS ON A LITTLE HILLOCK IN THE NW PORTION OF THE EASTERN PICNIC AREA, 3-10 FT ABOVE WATER LEVEL, T02N/R01W/S14. SBNF	SBD
6	10 in 1994	1994	BIG BEAR LAKE, SOUTH SHORE BETWEEN KIDD COVE AND FISHER COVE, SAN BERNARDINO MOUNTAINS. NEAR THE SHORE OF THE FIRST COVE WEST OF FISHER COVE IN FENCED MEADOW AT THE PUBLIC CAMP. WITHIN THE NE 1/4 OF THE SE 1/4 OF SECTION 23. SBNF	SBD
7	U	1941	SANTA ROSA MOUNTAIN, T07S/R05E/S27. SBNF	RIV
8	U	1901	"VAN DE VENTERS, SAN JACINTO MOUNTAINS". MAPPED AT VANDERVENTER FLAT, T07S/R04E. SANTA ROSA INDIAN RESERVATION.	RIV
13	U	1947	MARIANA CREEK, EAST SIDE OF LA PANZA RANGE, T30S/R16E	SLO

14	U	U	AMERICAN CANYON, LA PANZA RANGE. NOT SURE WHERE IN AMERICAN; CNDDDB LOCATION IS BEST GUESS, T30S/R16E	SLO
15	U	U	DERRYDALE CREEK, ALONG UPPER SESPE CREEK, T06N/R22W/S19	VEN
16	U	1965	ON WHITE LEDGE TRAIL ABOVE MANZANA CREEK, SAN RAFAEL MOUNTAINS. MAPPED ALONG MANZANA TRAIL WHICH RUNS BETWEEN MANZANA CREEK AND WHITE LEDGE CANYON, T08N/R28W	SB
17	90 in 1994	1994	ASPEN GLEN PICNIC AREA, BIG BEAR LAKE. NEAR PINE KNOT TRAILHEAD AND WEST OF DRAINAGE ALONG MILL CREEK ROAD. MAPPED IN THE NORTHWEST CORNER OF SECTION 30 AND THE NORTHEAST CORNER OF SECTION 25. SBNF	SBD
21	U	U	STONEY CREEK, SAN LUIS OBISPO COUNTY. COULD NOT LOCATE "STONEY CREEK". OCCURRENCE MAPPED ALONG STONY CREEK, IN VICINITY OF PINE RIDGE AND GARCIA MOUNTAIN, T31S/16E/S17	SLO
22	U	1941	PIPES CANYON, SAN BERNARDINO MOUNTAINS, T01N/R03E/S13	SBD

23	1 in 1998	1998	WEST OF UPPER HOLCOMB VALLEY, 0.9 AIRMILE NNE OF HITCHCOCK RANCH, NORTH OF BIG BEAR LAKE. ALONG UPPER ROCKY SLOPE NEAR RIDGETOP OF SOUTH RIDGE OF SUMMIT LABELED "JOHN" ON TOPO. MAPPED WITHIN THE SW 1/4 OF THE NE 1/4 OF SECTION 20.	SBD
24	1 or 2 in 2000, 6 in 2001	2001	UPPER COX CREEK DRAINAGE, 0.4 MI DOWNSTREAM FROM JACKRABBIT SPRING, EAST OF LITTLE PINE FLAT, HOLCOMB CREEK DRAINAGE. JUST EAST OF COXEY ROAD, ON BOTH SIDES OF INTERMITTENT DRAINAGE. MAPPED WITHIN THE NE 1/4 OF THE NE 1/4 OF SECTION 26. SBNF	SBD
25	4 in 2000, 19 in 2001	2001	ALONG KINLEY CREEK JUST EAST OF HIGHWAY 173, SAN BERNARDINO NATIONAL FOREST. MAPPED ALONG THE CREEK JUST EAST OF THE HIGHWAY AT JUNCTION WITH ROAD3N46. MAPPED WITHIN THE SW 1/4 OF THE NE 1/4 OF SECTION 28. SBNF.	SBD

26	6 in 2000, 1000 to 1500 in 2001	2001	NORTH OF WILLOW CREEK TRAIL JUST EAST OF HWY 173, ABOUT 0.75 MILE NE OF TOLL ROAD CAMPGROUND, NORTH OF LAKE ARROWHEAD. ALONG UNNAMED, UNMAPPED SMALL DRAINAGE ON THE NORTHEAST SIDE OF JUNCTION OF HIGHWAY 173 AND WILLOW CREEK TRAIL (ROAD 3N34). MAPPED WITHIN THE NW 1/4 OF THE SW 1/4 OF SECTION 33. SBNF.	SBD
27	80 in 2001, 40 in Western colony	2001	ALONG ORV TRAIL BETWEEN CRAB FLATS AND HOLCOMB CREEK, WEST OF BUTLER PEAK, SAN BERNARDINO NATIONAL FOREST. ALONG ORV TRAIL 1W17, HALFWAY BETWEEN TRAILHEAD AND PACIFIC CREST TRAIL. EASTERN COLONY WITHIN THE SW 1/4 OF THE NW 1/4 OF SECTION 10; WESTERN COLONY WITHIN THE SE 1/4 OF THE SE 1/4 OF SECTION 9. SBNF.	SBD
28	168 in 2001	2001	EAST OF CRAB FLAT, ON NORTH SIDE OF CRAB FLATS ROAD, SAN BERNARDINO NATIONAL FOREST. ON NORTHWEST SIDE OF ROAD 3N16 (CRAB FLATS ROAD) 0.3 MILE FROM JUNCTION WITH ROAD 3N34. PLANTS LOCATED IN UNNAMED DRY STREAM CORRIDOR AND ALL OF IT'S HEADWATER BRANCHES. MAPPED WITHIN THE NW 1/4 OF THE NW 1/4 OF SECTION 15. SBNF.	SBD

29	400 in 2001	2001	TENT PEG GROUP CAMPGROUND, WEST EDGE OF CRAB FLATS, WEST OF BUTLER PEAK, SAN BERNARDINO FOREST. ALONG FOREST ROAD 3N34. MAPPED WITHIN THE SW 14 OF THE NW 1/4 OF SECTION 16. SBNF.	SBD
30	12 in 2001	2001	ON EAST SIDE OF HIGHWAY 173, 0.6 MILE NORTH OF WILLOW CREEK JEEP TRAIL, EAST OF KINLEY CREEK, NORTH OF LAKE ARROWHEAD. IN ROADSIDE DITCH ON EAST SIDE OF HIGHWAY. MAPPED WITHIN THE NE 1/4 OF THE NW 1/4 OF SECTION 33. SBNF.	SBD
31	30 in 2001	2001	ALONG WILLOW CREEK JEEP TRAIL, 1.4 MILES EAST OF HIGHWAY 173, NORTH OF LAKE ARROWHEAD. ON NORTH SIDE OF TRAIL. MAPPED WITHIN THE NE 1/4 OF THE SW 1/4 OF SECTION 34. SBNF.	SBD
32	2 in 2001	2001	ALONG SQUINT RANCH ROAD, 1 MILE NORTH OF ROUSE MEADOW, NORTHEAST OF LAKE ARROWHEAD. ALONG ROAD 0.15 MILE SOUTH OF WATER TOWER. MAPPED WITHIN THE NW 1/4 OF THE NE 1/4 OF SECTION 1. SBNF	SBD

33	43 in 2002	2002	JUST NORTH OF HAWES RANCH, WEST SIDE OF COX SPRING CREEK, SAN BERNARDINO MOUNTAINS. ONE SMALL COLONY MAPPED PRIMARILY IN THE NE 1/4 OF THE NW 1/4 OF SECTION 35. SBNF	SBD
107055 (UCR)	U	1993	San Gabriel Mts., upper Lytle Creek Divide, T3N/R7W/S27 (Swinney/UCR)	SBD
126969 (UCR)	U	2003	San Bernardino Mts., Horsethief Creek near Pacific Trail, 2 km SW of Summit (Sanders/UCR)	SBD
130220 (UCR)	U	1998	Santa Rosa Mts., Santa Rosa Mountain Rd., 3.3 mi. South of CA-74	SBD
146266 (UCR)	U	1995	Transverse Ranges; San Gabriel Mts., head of Little Rock Creek ca. 0.5 mi. downstream from Alder saddle, elev. 4950 ft. (Mistretta/UCR). Most likely ANF.	LA
*	4543	2004	S. of Squints Ranch, between 3N38 & Sewage Disposal Ponds, North of 2N75 (Hawke, R.T.) Most likely SBNF.	SBD
*	2533	2004	SW of unknown peak elev. 4642 ft. SE ¼ of S36 & then also along Squint Ranch Rd. extending S. from the Jct. with 3N34 and E from 2N29Y (Hawke, R.T.) Most likely SBNF.	SBD

616870 (RSA)		1998	San Bernardino Mountains: West of Upper Holcomb Valley, south of John Peak. Near 34 ° 18'60" N 116 ° 54'49" W. T3N R1E NE/4 sec. 30. Elev. 7850 Feet (Soza/RSA)	SBD
641303 (RSA)		1995	San Gabriel Mountains: Devil's Punchbowl. Near 34 24 54 N 117 50 55 W.. Elev. 4300 Feet (Mistretta/RSA)	LA
377414 (RSA)		1978	San Bernardino Mountains, Baldwin Lake, 3.0 miles E of Big Bear City. Elev. 6700 ft (Davidson/RSA)	SBD
49876 (RSA)		1924	Ca. 1.0 mile west of Fawnskin (Johnston/RSA)	SBD
342821 (RSA)		1978	Baldwin Lake: Alkaline meadow at the N end of Baldwin Lake, S of Highway 18. Elev. ca. 6700 feet (Thorne/RSA)	SBD
549222 (RSA)		1992	San Bernardino Mountains, San Bernardino National Forest. vicinity of Rock Camp Ranger Station - from the station to ca. 1 mile due E, & at widest part of site, S to Highway 173. (T2N R3W, centers of E/2 of sec. 5 & W/2 sec. 4; extending E almost to center of sec.4). Elev. ca. 4900 ft. (White/RSA) SBNF.	SBD
338396 (RSA)		1980	Near Mojave River, S of Hesperia and 5.2 miles N of junction of Silverwood Lake and Hesperia roads; elev. 3200 feet. (Thorne/RSA)	SBD

226159 (RSA)		1971	Mystic Canyon, Angeles National Forest, San Gabriel Mountains 2 miles NE of Glendora, elev. ca. 2000 ft. (Cromwell/RSA). ANF	LA
230176 (RSA)		1969	San Gabriel Mountains, Angeles National Forest: Charlton Flats burn (of 1954), elev. ca. 5250 feet. ANF	LA
229003 (RSA)		1971	San Gabriel Mountains, Angeles National Forest: S Fork of Little Rock Creek 1.8 miles below Alder Saddle in Pinyon Flats area, elev. ca. 5100 ft. (Thorne/RSA) ANF	LA

- *U* = Unknown
- * = an occurrence number has not been assigned
- *SBNF* = San Bernardino National Forest
- *RIV* = Riverside County
- *SBD* = San Bernardino County
- *SLO* = San Luis Obispo County
- *VEN* = Ventura County
- *SB* = Santa Barbara

Threats

Calochortus palmeri var. *palmeri* can be affected by overgrazing, trampling, flooding, erosion, off-highway vehicles, and development projects (Lardner et al. 1998). The species is most vulnerable to impacts from grazing between April and August, when the plant is flowering and setting seed. This taxon is also affected by dispersed and developed recreation. At least seven occurrences of *Calochortus palmeri* var. *palmeri* are located in protected areas: one on the San Bernardino National Forest near Big Bear Lake, where it occurs within a fenced meadow area with *Sidalcea pedata*, and the other six [American Canyon, Chuchupate, Chorro Grande, Godwin Canyon (2 occurrences), and Manzanita Creek/White Ledge] are in areas free of human disturbance on the Los Padres National Forest. *Calochortus palmeri* var. *palmeri* is reported to be "declining rapidly" due to grazing in wet meadow (California Native Plant Society 2001) but there is little in the way of documented evidence that this is occurring.

On the SBNF, plants are affected by annual nonnative grasses, incised streams affecting meadow habitat, dispersed and developed recreation including activities at Tent Peg Campground, Aspen Glen

Picnic Area, along Forest Designated 1W17 OHV trail, and by road maintenance along Forest System Roads 3N16 and 3N14. The degree of these threats is not known. At least 16 occurrences were burned over in the 1999 Willow Fire on the Mountaintop District of the San Bernardino National Forest. Burned area emergency rehabilitation (BAER) measures were avoided within occupied habitat to the greatest extent possible however fire suppression actions and BAER projects could affect occurrences during future fires. Occurrences located within Wildland Urban Interface defense zones could be affected by vegetation treatments to reduce fuels however because habitat is within riparian areas, there would be an elevated effort to protect habitat.

Conservation and Management Considerations

- Relocate historic occurrences of *Calochortus palmeri* var. *palmeri* at the following locations: (on the Los Padres National Forest) above Juncal Dam, American Canyon, Mariana Creek, La Panza Range, and Manzana Creek; (on the San Bernardino National Forest) Squints Ranch, Santa Rosa Mountains, and the two locations at Big Bear Lake.
- If relocated, collect and record data on location, habitat characteristics and status, population size, and identify any needs for habitat management.
- If populations are sufficiently large, collect and voucher specimens in a regional herbarium.
- If populations are found in active grazing allotments, determine effects of grazing on *Calochortus palmeri* var. *palmeri*.
- When resurveying occurrences on the SBNF, document presence/absence of *Bromus tectorum* and other annual nonnative grasses.
- Review information on the Santa Rosa Mt. occurrences (occurrences 7, 8) and confirm identification.

Evaluation of Current Situation and Risk on National Forest System Lands

Calochortus palmeri var. *palmeri* has a fairly broad distribution and is found in at least seven mountain ranges. In some areas it is locally common, but in most locations the size of the population is small (less than 100 plants). Within its range in southern California, some occurrences of *Calochortus palmeri* var. *palmeri* are found in areas that are remote and largely free from human disturbance, some occur in areas subject to human uses (primarily grazing, dispersed and developed recreation and roads). For some occurrences there is no current information available regarding the status of plants and habitat. In the near future, occurrences may be affected by vegetation treatments for fuels management within Wildland Urban Interface defense and threat zones, however the level of this threat is not known.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	C	B	C	A

Calochortus palmeri var. *palmeri* is a USDA Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The viability of this species is tied to protection and management of meadow and riparian habitats. This taxon is included in the SBNF Meadow Habitat Management Guide; implementation of this guide is expected to occur to some extent across all alternatives. With implementation of the standards for riparian areas, viability for this species on NFS lands is secure. Activities affecting this taxon, the Suitable Use restricting motorized and mechanized vehicle travel to National Forest System roads and designated trails, Standards regarding rare species, vegetation, recreation and grazing management along with recommendations for new Special Area designations under Alternatives 2-6 were considered in the outcomes. Land use zoning and the emphasis of each alternative were also considered as was the wide range of this taxon.

On the Los Padres National Forest, land near the Frazier Mt. occurrence would be zoned as Developed Area Intermix and Back Country in Alternatives 1, 2, 4, 4a and 5. In Alternative 3, Back Country Non-Motorized would replace some of the Back Country in Alternative 2 above. In Alternative 6, this area would be zoned Developed Area Intermix and Back Country Non-Motorized. The area of the Alamo Mountain occurrence would be zoned Back Country in Alternatives 1, 2, 4, 4a and 5. In Alternative 3, it would be zoned a combination of Back Country and Back Country Non-Motorized. In Alternative 6 it would become Back Country Non-Motorized with Recommended Wilderness adjacent.

On the San Bernardino National Forest, the Cox Creek occurrence just south of Little Pine Flat is located at the edge of Back Country zoning in Alternatives 1, 2, 4, 4a, 5 and 6. In all of these alternatives except 5, the Back Country Non-Motorized zoning would be retained on the south side of the occurrence. Under Alternative 5, this area would become zoned Back Country. This is important because this location was rehabilitated during the current land management plan to reflect the current non-motorized zoning. This location in Alternative 3 is recommended as the Deep Creek Wilderness.

The occurrence near Hawe's Ranch would retain management under the current Back Country Non-Motorized zoning in Alternatives 1, 2, 4 and 6. In 4a all of this area would be retained as Back Country Non-Motorized except the road to Hawe's Ranch reopened during the 2003 Old Fire which would be zoned Back Country Motorized Use Restricted. In Alternative 5, the current Back Country Non-

Motorized zoning would change to Back Country. In Alternative 3 the Deep Creek Wilderness would be recommended.

The Tent Peg occurrence would be zoned Developed Area Intermix and Back Country Non-Motorized in alternatives 1, 2, 3, 4a and 6. In Alternatives 4 and 5 it would be zoned Developed Area Intermix and Back Country.

The Rock Camp and Kinley Creek occurrences would be zoned Back Country in 4, 4a, and 5, Back Country Non-Motorized and Back Country in 1, 2, 3, and 6.

On the Angeles National Forest, the Pinyon Flats area would be zoned as Back Country in Alternatives 1, 4, and 5. Back Country zoning and Recommended Wilderness would occur in Alternatives 2 and 3. This location in Alternative 6 would be zoned Back Country Non-Motorized and Recommended Wilderness. Alternative 4a would be zoned Back Country and Back Country Non-Motorized.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Much of the private lands within and adjacent to the Angeles, Los Padres and San Bernardino National Forests have been converted by residential and commercial development. The remaining private lands continue to be lost as continued development occurs. This loss is not expected to reduce the viability of the protected and managed occurrences on the ANF, LPNF, and SBNF. By maintaining the current distribution of the *Calochortus palmeri* var. *palmeri* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause the *Calochortus palmeri* var. *palmeri* to suffer a decline in its overall distribution. The range of this taxon was also considered in predicting these outcomes.

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**Calochortus palmeri var.
munzii**

Calochortus plummerae

Calochortus plummerae

Calochortus plummerae E. Greene (Plummer's mariposa lily)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3; S3.2 (California Natural Diversity Database)

California Native Plant Society (2001) List 1B; R-E-D Code 2-2-3

General Distribution

Calochortus plummerae occurs in the Santa Monica, San Gabriel, San Bernardino, San Jacinto, and Santa Ana Mountains, and on alluvial fans at the base of these ranges. There are 62 known occurrences, most of which are on private land (California Natural Diversity Database 2004) there are five additional occurrences not assigned occurrence numbers yet from Rancho Santa Ana Botanic Garden (RSA). Major populations occur adjacent to National Forest System land on alluvial fans at Day Canyon, Etiwanda, and Summit Valley.

Distribution in the Planning Area

There are roughly nine reported occurrences of *Calochortus plummerae* on the San Bernardino National Forest, nine on the Angeles National Forest, and at least one in the northern Santa Ana Mountains. *Calochortus plummerae* also has the potential to occur on the Los Padres National Forest (USDA Forest Service 2002). Occurrences include Lone Pine Canyon, Sevine Road near Lytle Creek, and near Grapevine Spring in the San Gabriel Mountains; and City Creek Road, Lower Santa Ana River, and Cajon Junction in the San Bernardino Mountains (California Natural Diversity Database 2004). Other occurrences in the San Bernardino Mountains are at Cleghorn Canyon, Badger Canyon, Oak Glen, Water Canyon, Mill Creek, the Seven Oaks Dam area, and Cajon Pass (USDA Forest Service 2002).

Taxonomy and Natural History

Calochortus plummerae is a monocotyledon in the lily family (Liliaceae). *Calochortus plummerae* is a

perennial bulbiferous herb that blooms May–July. It appears to be closely related to intermediate mariposa lily (*Calochortus weedii* var. *intermedius*), with which it hybridizes in the San Jose Hills and Puente Hills. (California Native Plant Society 2001)

Calochortus plummerae has a fibrous bulb coat. The stems are 30-60 cm, slender, and generally branched. The basal leaves are 20-40 cm and withering. Cauline leaves are 4-17 cm, with the upper portion inrolled. The inflorescence is characterized by 2-6 erect flowers with leaf-like bracts. The perianth is widely bell-shaped. The sepals are 30-50 mm and long-tapered. The petals are 30-40 mm, pale pink to rose, drying purplish, with toothed margins (rarely fringed), and long-yellow hairy in the wide central band. The nectary is round, slightly depressed, more or less glabrous and more or less hidden by dense, orange bordering hairs. Fruit are erect, 4-8 cm, linear, and angled (Fiedler & Ness 1993).

Habitat Description

Calochortus plummerae is found at elevations of 325–5,580 feet (100–1,700 meters) on rocky, granitic soils, or on gravelly alluvium, generally in chaparral or coastal sage scrub habitats and less often in grasslands, alluvial fan sage scrub, oak woodland, and Ponderosa pine woodland. *Calochortus plummerae* has been found in association with *Adenostema fasciculatum*, *Salvia mellifera*, *Artemisia californica*, *Lotus scoparius*, and *Yucca whippleyi* (California Native Plant Society 2001, California Natural Diversity Database 2004).

Occurrence Status

There are 62 known reported occurrences of *Calochortus plummerae*, 22 of which are on USFS land. Several of the occurrences on private land have been extirpated by development.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Calochortus plummerae* (Plummer's mariposa lily)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1	U	1958	May Valley Truck Trail. 3 mi. SE of Saunders Meadow, SE of Idyllwild. Ponderosa-Jeffrey pine woodland. Common in full/partial sun with grasses and moist soil. SBNF	RIV
2	30 in 1990	1990, 1991	Canyon of the San Jacinto River, ca. 6 mi. E of Fairview Ave. along Hwy 74. Chaparral on S-facing rocky slopes, dry sandy soil. Land owner: U	RIV
3	3 in 1991	1901, 1991	Canyon of the San Jacinto River, ca. 5 mi. E of Fairview Ave. along Hwy. 74. N side of Hwy. Land owner: U	RIV
4	0 in 1989-1991	1926, 1989	Near Banning. Much development in area. Land owner: U	RIV
5	U	1978, 1992	Cherry Valley Exit off I-10, ca. 2 mi. S of Calimesa. Land owner: U	RIV
6	0 in 1989-1991	1932, 1989-1991	Badlands SW of Beaumont, 1.5 mi. SW of the summit of Moreno Grade. Upper Sonoran. Weathered granite. Along Hwy 60, ca. 1 mi. E of Gilman Springs Road. Land owner: U	RIV
7	0 in 1989-1991	1915, 1989-1991	Head of Banning Canyon. Mapped ca. 4-5 mi. SSE of Forest Falls along the San Gorgonio River. SBNF?	RIV, SBD

8	0 in 1991	1928, 1991	Forest Home, San Bernardino Mtns. PVT	SBD
9	4	1993	0.5 mi. W of Oak Glen Conservation Camp, SE of Oak Glen. w/ <i>Arctostaphylos glauca</i> , <i>A. glandulosa</i> . Potential threat = trail cutting by conservation camp fire crews. SBNF.	SBD
10	3	1992	Water Canyon near junction with Wildwood Canyon. Rock outcrop on side of a canyon, surrounded by chaparral. Land owner: U	SBD
11	U	1936	Santa Ana River, just below Seven Oaks, San Bernardino Mtns. Infrequent on weathered granite in Jeffrey pines. Land owner: U	SBD
12	1 in 1991, 0 in 1992	1897, 1991, 1992	Mill Creek Canyon, along Hwy 38 ca. 2.8 mi. E of Bryant St. Land owner: U	SBD
13	30	1994	Lower Santa Ana River Cyn, ca. 0.5 mi. NE of mouth of Deep Creek, San Bernardino Mtns. Upslope of flume access road, above expected high-water line for reservoir. Grassy clearings and granitic rock outcrops in diverse Riversidean sage scrub/mixed chaparral mosaic. W/ <i>Eriogonum fasciculatum</i> , <i>Yucca whipplei</i> , <i>Toxicodendron</i> , <i>Salvia apiana</i> , <i>Lotus scoparius</i> , <i>Bromus rubens</i> , <i>B. tectorum</i> .	SBD

			Plants found only in clearings, absent in dense shrub areas. SBNF.	
14	U	1991	W end of Crafton Hills, ca. 0.5 mi. SE of Crafton Reservoir. May be threatened by indirect impacts from nearby development. Broken rock outcrop in drainage on N-facing slope. w/ <i>Zauschneria californica</i> , <i>Eriogonum fasciculatum</i> , <i>Mimulus longiflorus</i> , <i>Erigeron foliosus</i> . Eastern terminus of Citrus Ave. Land owner: U	SBD
15	U	1992	Santa Ana River Wash, NE of Redlands. Fairly common in rocky alluvium w/ chaparral. Land owner: U	SBD
16	U	1927	On City Creek Road below 'Inspiration Point', San Bernardino Mtns. Chaparral along Hwy 330, ca. 2-3 mi. W of Running Springs. SBNF.	SBD
17	1	1993	NE of CSU, San Bernardino along Tributary to Badger Cyn, ca. 0.9 mi. SSW of Marshall Peak. Open chaparral with <i>Adenostoma fasciculatum</i> , <i>Salvia mellifera</i> . Development planned for site. PVT.	SBD

18	2	1993	NE of CSU, San Bernardino near mouth fo Badger Cyn, ca. 1.2 mi. SSW of Marshall Peak. Development Planned for site. PVT.	SBD
19	5 total in 3 colonies	1993	NE of CSU, San Bernardino near mouth of Badger Cyn, ca. 1.2 mi. SSW of Marshall Peak. Planned development. Open chaparral w/ <i>Adenostoma fasciculatum</i> , <i>Salvia mellifera</i> . PVT.	SBD
20	U	1938, 1992	Rialto, N of Highland Ave. Vicinity of where Cajon Wash merges w/ Mill Creek Wash. Presumably extirpated from development. Land owner: U	SBD
21	U	1990	Cajon Pass Area, 0.25 mi. N of Institution Rd. Riversidean alluvial fan sage scrub w/ <i>Cercocarpus betuloides</i> , <i>Eriogonum fasciculatum</i> , <i>Opuntia littoralis</i> , many weeds. Land owner: U	SBD
22	U	1971	Grapevine Spring, San Gabriel Mtns. SBNF.	SBD
23	U	1971	Along San Sevaine Rd. from Lytle Creek, San Gabriel Mtns. Along FR 1N34 S of Grapevine Cyn, btw. Texas Hill and San Sevaine Cow Camp. SBNF.	SBD

24	89	1994	Mouth of Day Canyon, SE of Day Canyon Station, Etiwanda. Slated for development. Riversidian alluvial fan sage scrub w/ <i>Salvia apiana</i> , <i>Eriodictyon crassifolium</i> , <i>Artemisia californica</i> . San Bernardino County, Ecological Reserve.	SBD
25	U	1935	Pomona, near Evey Cyn. Site name of 'Pomona', but T-R-S-place site in vicinity of Evey Cyn, N of Upland. Land owner: U	LA
26	U	1992	Claremont, Live Oak Cyn. Much habitat in area has been lost to development. U	LA
27	U	1937, 1991	Claremont, along Mills Ave. Much habitat in area lost to development. Land owner: U	LA
28	U	1949	Johnstone Peak, N of San Dimas, San Gabriel Mtns. Brush-grassland. ANF	LA
29	U	1992	Hill above W Hillcrest Blvd., Monrovia. Much habitat lost in area due to development. Land owner: U	LA
30	U	1921	Mt. Wilson. ANF?	LA
31	U	1918	Hills E of Rubio Canyon, San Gabriel Mtns. Burnt area. ANF	LA

32	40	1989, 1991	Mojave River District, ca. 0.5 mi. on Rancho Las Flores Rd. before power lines, Summit Valley. Priv, proposed for development.	SBD
33	12 in 2 colonies	2000	Cajon Cyn, just NW of Cajon junction along I-15. Canyon intersected by I-15, railroads, dirt rds. Gravel mining also = threat. In chaparral w/ weeds. w/ <i>Hirschfeldia incana</i> , <i>Achnatherum speciosum</i> , <i>Lotus scoparius</i> , <i>Adenostoma fasciculatum</i> . 2 colonies. SBNF.	SBD
34	U	1969	Lower Lone Pine Canyon, near Lost Lake, San Gabriel Mtns. Low open chaparral w/ <i>Penstemon spectabilis</i> , <i>Paeonia californica</i> . SBNF.	SBD
35	40	1992	Lone Pine Canyon, along Lone Pine Cyn Rd. Scattered along N side of road, 1 mi. E of road to Sharpless Ranch. SBNF.	SBD
36	U	1930	Trail btw. Camp Coldbrook and Pine Flats, San Gabriel Mtns. Btw. Coldbrook Guard Station and W Pine Flat near Hwy 39. ANF	LA
37	U	1921	N Fork San Gabriel River. Mapped along River, upstream from confluence with Bichota Canyon. ANF	LA

50	U	1933	Coldwater Canyon, near Colbys Ranch, Sierra Madre Mtns (San Gabriel Mtns.) ANF	LA
51	0 in 1989-1991	1910, 1989	Head of Long Canyon, San Gabriel Mtns. S of the Angeles Crest Hwy at George's Gap. Land owner: U	LA
52	U	1948, 1991	Near Reese Ranch, Little Tujunga Canyon. Land owner: U	LA
57	U	1992	1.5 mi. S of Skyline Road along main divide road, btw. Oak Flat and Pleasants Peak, Santa Ana Mtns. Infrequent in chaparral openings. CNF	OR
59	5-7 between this occ. and occ. #60	1999	S of Modjeska 1.1 mi. WNW of Vulture Crag, W of Santiago Peak. Several plants observed in chaparral regrowth after fire w/ <i>Adenostoma fasciculatum</i> , <i>Lotus scoparius</i> . PVT.	OR
60	5-7 between this occ. and occ. #59	1999	WSW of Vulture Crag, 0.25 mi. WNW of 4S Ranch, S of Modjeska. Several plants observed in chaparral regrowth after fire w/ <i>Adenostoma fasciculatum</i> , <i>Lotus scoparius</i> . PVT.	OR

61	8	1999	N slope Lower Trabuco Canyon, 3 mi. SSW of Santiago Peak Summit, NE of Trabuco School. Along dirt road in chaparral and sage scrub. PVT.	OR
62	5	2001	SW of Devore, 1.1 mi. just NNE of JCT Hwy 30 and I-15, NE of Gilfillan Airport, E of Rialto. Site to be annexed by County as open space. Riversidian sage scrub/alluvial scrub w/ rocky substrate. w/ <i>Artemisia scoparius</i> , <i>Prunus ilicifolia</i> , <i>Delphinium cardinalis</i> . PVT.	SBD
63	20	2000	W side of mouth of Deer Cyn, 3.7 mi. SSE of Cucamonga Peak, N of Alta Loma. Threatened by development. Along unimproved trails adj. to Riversidian sage scrub and coastal sage chaparral scrub. PVT.	SBD
64	U	1998	East Etiwanda Creek, ca. 2 mi. upstream from Hwy 30 crossing, E of Alta Loma. Site planned for development. In mostly dense coastal sage scrub, often dominated by <i>Salvia apiana</i> . Plants uncommon. PVT.	SBD

65	141 between this occ. and occ. #66	2000	Just N of Padua Hills Theater, Palmer Canyon, NE of Claremont. Planned for housing development. In chaparral on red clay soils. PVT.	LA
66	141 between this occ. and occ. #65	2000	W of San Antonio Creek Channel and LA/SBD line. 0.5 mi. NE of Scudder Oaks School, E of Claremont. Planned for housing development. PVT.	LA
67	29	2001	Lower Monroe Road 0.25 to 0.6 mi. S of Glendora Mtn. Road, SW of Horse Canyon Saddle, N of Glendora. Road maintenance. On roadside along ridgetop and in fuelbreak. Type converted plant community. ANF.	LA
68	23	2001	Road along ridge btw. Little Dalton and Monroe Canyons. 1.2 mi. SW of Horse Canyon Saddle, N of Glendora. Road maintenance. On roadside along ridgetop and in fuelbreak. Type converted plant community. ANF.	LA
69	5	2001	Between Little Dalton and Mystic Canyons, along lower Monroe Rd. 3 mi. SSW of Horse Canyon Saddle, N of Glendora. Road maintenance. Type converted plant community. ANF.	LA

70	5	2001	Along powerlines and FR 3N55, 0.2 to 0.3 mi. N of Hwy 138, ca. 0.8 mi. WNW of Cajon Junction. Erosion on road cut. ANF.	SBD
71	20	2001	Northern limits of Sierra Madre, 0.45 mi. SW of Sierra Madre Dam, E of Pasadena. Proposed high school development. Coastal sage scrub w/ <i>Eriogonum fasciculatum</i> , <i>Artemisia californica</i> , <i>Sambucus mexicana</i> , <i>Rhus ovata</i> , <i>Malosma laurina</i> , <i>Dicentra chrysantha</i> . PVT.	LA
72	U	1992	ca. 200' S of Indian Ben Saddle, just NE of Iron Mtn., San Gabriel Mtns. SE rocky slope in chaparral. Needs fieldwork. Land owner: U	LA
73	8	1998	Simi Valley Landfill, N of Simi Valley, Ridge btw. Brea and Alamos Canyons. Proposed landfill expansion will come w/in 200' of this population. Mostly disturbed, w/ <i>Centaurea melitensis</i> , but plants seem to grow under canopy of scattered chamis and purple sage shrubs. PVT-Simi Valley Landfill.	VEN
74	U	1901	Hills near Sherman. Extirpated. Land owner: U	LA

75	U	1938	Topanga Canyon. Site mapped to include length of entire canyon. Needs fieldwork. Land owner: U	LA
76	U	1926	Monrose. Possible threat from development. Needs fieldwork. Land owner: U	LA
77	U	1897	Near Newhall. Possible threat from development. Land owner: U	LA
78	U	U, 1999	Conejo Valley. Several populations. Land owner: U	VEN
79	155	2001	Ahmanson Ranch. S of Bell Canyon on S side of Simi Hills, W of Woodland Hills. Planned for development. w/ coast sage scrub and grassland in rocky/sandy areas. Along trail on top of ridge S of Bell Canyon. PVT-Ahmanson Land Co.	VEN
222901 (RSA)	12	2004	Day Cyn. Just past old gaging station on steep canyon wall, T1N/R6W/S8, elev. 2900-3000 ft. (Fraga/RSA)	SBD
* (RSA)	3600 estimated	2004	Alluvial wash of Day Cyn. Dirt road off of Day Creek Ave. that runs along power lines S. of Old Day Creek Station, T1N/R6W/S17, elev. 2100-2300 ft. (Fraga/RSA)	SBD

* (RSA)	500 estimated	2004	Along Barrett Stoddard Rd. (2N041) between Barrett Cyn. And Cascade Cyn. On both sides of the road, T2N/R7W,8W/S31,36, elev. 4400 ft. (Fraga/RSA)	SBD
* (RSA)	177	2004	From sierra Ave. to road 1N34. Off of road 1N34 just S. of Grapevine Springs, elev. 3500-3900 ft. (Fraga/RSA)	SBD
* (RSA)	460	2004	Evey Cyn. Off of Mt. Baldy Rd. on S. ridgeline of Evey Cyn. Above Evey Cyn. Rd. on fuelbreak, T1N/R8W/S11, elev. 2400-2600 ft. (Fraga/RSA)	LA
* (RSA)	567	2004	Along City Creek Rd. 1N09 E. from Little Creek intersection with 1N09, W. to unknown Peak elev. 4039 ft. in SW ¼ of Sect. 15 (Hawke, R.T.)	SBD

- *U = Unknown*
- *CNF = Cleveland national Forest*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*
- *VEN = Ventura County*
- *RIV = Riverside County*
- *OR = Orange County*

Threats

Calochortus plummerae is threatened by development projects, trail construction and maintenance, fire suppression, habitat conversion, trampling, and sand and gravel mining (California Natural Diversity

Database 2004).

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Calochortus plummerae*:

- Survey all new occurrences of *Calochortus plummerae* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Perform focused surveys of all Alluvial Fan Scrub on the SBNF, ANF, and CNF for this species and associated rare plants
- Collect a herbarium voucher specimen of *Calochortus plummerae* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least five years prior.
- Map known and new occurrences of *Calochortus plummerae* in the Province using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Calochortus plummerae is a southern California endemic, known from scattered occurrences across the coastal foothills and alluvial fans. While none of these occurrences are fully protected from identified threats, several occurrences across the range are not at risk, and considerable areas of unsurveyed suitable habitat exists for this species.

Based on the above analysis, *Calochortus plummerae* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Calochortus plummerae is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Calochortus plummerae* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Calochortus plummerae* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Calochortus palmeri var.
palmeri**

Calochortus simulans

Calochortus simulans

Calochortus simulans (Hoov.) Munz (San Luis Obispo mariposa lily)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3, S2.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Calochortus simulans is endemic to San Luis Obispo and Santa Barbara counties from the southern Santa Lucia Mountains near Lake Nacimiento to Aliso Creek in the front country of Sierra Madre ridge (CalFlora 2002).

Distribution in the Planning Area

There is one record of *Calochortus simulans* specifically being on National Forest System land near La Panza Campground (Fiedler 1982), and several other citations have general descriptions of locations that may be on the Los Padres National Forest such as "roads in vicinity of Hi Mountain, 1997 La Panza burn" (Smith 1998). Other records are from locations immediately adjacent to the Los Padres National Forest, such as "ranch above Aliso Creek near Pine Canyon Ranger Station in lower Cuyama River Canyon; also scattered...along Buckhorn Road near Hwy 166" (Smith 1998). These records suggest that *Calochortus simulans* may occur in more than one location on the Los Padres National Forest. No recent surveys have looked for this plant, however.

Taxonomy and Natural History

Calochortus simulans is a monocot in the lily family (Liliaceae, section *Mariposa*) and is distinguished from other members of the section by its white to sometimes yellow petals and the presence of a square gland that is not depressed and is placed in a red spot, the only spot found on the petals (Fiedler & Ness 1993).

Calochortus simulans is bulb-bearing perennial herb (California Native Plant Society 2001). The base of the stems can produce bulblets (Fiedler & Ness 1993). Not all of the mature individuals within a population produce flowers and seed each year.

Calochortus simulans appears to have an 'endurer' life history strategy for coping with wildfire. When wildfire occurs, the current year's crop of stems, flowers, fruits, and seeds are generally consumed by fire resulting in a loss of one year's reproductive output. However, the affected plants typically live, the plant's bulbs being sufficiently deep in the soil to survive most fire events. In response to post-fire environmental cues, most populations of *Calochortus* respond the year after a wildfire event with higher than usual percentages of plants producing flowering stems. This results in increased reproductive output and the dispersal of seeds into an environment that for a short period of time will produce less competition from neighboring plants.

Habitat Description

Calochortus simulans is found in chaparral, cismontane woodlands, lower montane coniferous forest, and valley and foothill grassland on sandy, often granitic but sometimes serpentinite substrates, at elevations of about 1,300–3,600 feet (395–1,100 meters) (California Native Plant Society 2001).

Occurrence Status

Calochortus simulans is widespread in central San Luis Obispo County and, in some years and in some places, it has flowered in great abundance (Hoover 1970). Smith (1998) notes that *Calochortus simulans* is common in some areas.

Threats

Although this species is distributed in a limited number of occurrences, the California Native Plant Society (2001) does not consider *Calochortus simulans* to be endangered.

The location of the single documented occurrence of *Calochortus simulans* on the Los Padres National Forest is in an area used for livestock grazing, and there is a campground nearby, a dirt road to the south, and an OHV trail to the north. Currently, there is no other site-specific information available on that location.

Conservation and Management Considerations

More information is needed to determine the status of the occurrence reported from La Panza Campground and to determine if *Calochortus simulans* does occur elsewhere on the Los Padres National Forest.

Evaluation of Current Situation and Threats on National Forest System Lands

Calochortus simulans is found only in portions of San Luis Obispo and Santa Barbara counties. The limited information on the status of the species suggests that dispersed recreation, off-highway vehicle use, and grazing may affect both plants and habitat.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Calochortus simulans, although apparently relatively common in some areas, has what appears to be a very limited distribution on National Forest Systems lands, and one or more of these occurrences may be at risk from grazing and dispersed recreation. This risk does not vary by alternative since grazing intensities within the range of the species would not change. Due to the lack of information on the species current distribution and abundance, it must be assumed that under all alternatives habitat on National Forest System lands would only provide for continued species existence in isolated patches relative to historic distribution.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	B	B

The available information indicates that *Calochortus simulans* remains well distributed across its historic range and that habitat is of sufficient quality, distribution and abundance to allow the species population to remain stable or stabilize.

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Calochortus plummerae

Calochortus striatus

Calochortus striatus

Calochortus striatus Parish (Alkali mariposa lily)

Management Status

Federal: Forest Service Sensitive, USFWS Species of Concern, BLM Sensitive

California: None

Heritage Rank: G2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-2

General Distribution

Calochortus striatus is a rare endemic of moist alkaline areas in the arid interior of southern California and southern Nevada. *Calochortus striatus* occurs in the southern Sierra Nevada, in the western, central and southern Mojave Desert, at the north base of the San Bernardino Mountains, in the southern San Joaquin Valley, and in southern Nevada. The California Natural Diversity Database (2004) lists 45 occurrences and nine general locations. In California, populations are scattered in Kern, northeastern Los Angeles, and southern and central San Bernardino counties. The largest populations of this species occur at several localities within Edwards AFB.

In Nevada, the only two populations occur in Clark County near Las Vegas and in Nye County near Ash Meadows. It is considered "critically endangered" in Nevada as these two populations are very small and apparently have not been seen recently (Mozingo and Williams 1980; Kartesz 1988; Morefield and Knight 1992).

Distribution in the Planning Area

There are no extant occurrences known with confidence from NFS lands in the Plan area. Occurrence no. 26 was from Whiskey Springs in Cushenbury Canyon (on SBNF), but this occurrence is reported to have been extirpated by construction of Hwy 18. Occurrence no. 9 is a 1972 collection from Pinyon Flats on the Angeles National Forest; however, this collection may be a misidentification. Known occurrences near the San Bernardino National Forest include Cushenbury Springs, Box S Springs, and Rabbit Springs, all in Lucerne Valley (California Natural Diversity Database 2004). Additional suitable

habitat on the San Bernardino National Forest may exist along the north and east Forest boundaries, from Grapevine Canyon east to Terrace Springs and southeast to Viscera Springs and Rattlesnake Canyon.

Taxonomy and Natural History

Calochortus striatus is a monocotyledon in the lily family (Liliaceae). This taxon is a perennial bulbiferous herb (California Native Plant Society 2001). Parish (1902) originally described alkali mariposa lily (Liliaceae) from his collection at Rabbit Springs in Lucerne Valley.

Calochortus striatus is a perennial arising from a small membranous-coated corm and has two or three slender, grass-like, basal leaves 4-8 in. (10-20 centimeters) long that are withered by the time the plant flowers. The inflorescence is umbel-like with one to five erect bracts 0.5-1.25 in. (1-3 cm) long. This species flowers from April through June. The perianth is bell-shaped with a narrowed base and the sepals are 0.4-0.8 in. (10-20 mm) long. The petals are 0.8-1.2 in. (20-30 mm) long, irregularly toothed at the tip, and are white to lavender with conspicuous purple veins. The oblong nectary on the upper petal surface is not depressed and is densely simple-hairy. The fruit is erect, 1-1.5 in. (4-5 cm) long, linear in shape, but angled in cross section (Fiedler & Ness 1993). The flower is perfect and is pollinated by flies and bees (Tollefson 1992). It is unknown whether reproduction is most commonly from seedling establishment or corm division (deBecker 1985).

This species is very distinctive and should not be confused with any other *Calochortus* species. Most notably, it can be distinguished from other mariposa lilies by subumbellate inflorescence, oblong gland and obvious dark purple veins on the petals. Over much of its range the only other mariposa lily in the same general habitats is *Calochortus kennedyi*, which has bright orange flowers.

A number of early authors (Jepson 1921; Abrams 1923; Jaeger 1940) placed *Calochortus striatus* in synonymy with the related *Calochortus palmeri*, but this was based partly on a confusion of type specimens and this treatment has not been followed by more recent authors (Fiedler & Ness 1993, Munz 1959). It appears that the species has been uniformly accepted as distinct since the monograph of Ownbey (1940).

Habitat Description

Calochortus striatus grows in calcareous sandy soil (Fiedler 1985), in seasonally moist alkaline habitats such as alkali meadows (Mozingo and Williams 1980), ephemeral washes, vernal moist depressions, and at seeps within saltbush scrub at 300-4500 ft. (800-1400 m) elevation (Fiedler & Ness 1993). These habitats are narrowly distributed within the Province and are threatened by water developments and altered hydrological regimes. Plants are not found in soils with surface salts, or wetter areas with permanent standing surface water (Mitchell 1988). The bulb remains dormant and does not sprout in dry years.

Occurrence Status

Calochortus striatus is known to exhibit high annual variation based on precipitation (Tollefson 1992).

There are no confirmed extant occurrences of *Calochortus striatus* on National Forest System lands. The historical occurrence at Whiskey Springs within the San Bernardino National Forest boundary was probably extirpated by Highway 18 construction in the 1920s (California Natural Diversity Database 2004). The Cushenbury Springs occurrence may be adversely affected by upstream water diversion/extraction by Mitsubishi Cement Corporation (USDA Forest Service 2002).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Calochortus striatus* (Alkali mariposa lily)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
9	U	1972	Pinyon Flats. May be misidentification. ANF.	LA
25	< 50 in 1981	1981	Edge of Cushenbury Springs, ca. 0.5 mi. N of SBNF boundary. N of Kaiser parking area. Scattered in open saltbush/ <i>Carex</i> scrub. Flow of springs has been diked for use by Kaiser Plant. Expansion of Kaiser cement parking area extended into main site in 1988. Needs field check to determine extent of damage. PVT.	SBD
26	U	1981	Whiskey Springs, Cushenbury Canyon. Extirpated from construction of Hwy 18 (1920's) which runs directly through Whiskey Springs. SBNF.	SBD
27	30-40	1980	Rabbit Springs, Lucerne Valley, Mojave Desert. Alkaline meadows about the springs. PVT.	SBD

28	50-100	1982	Box S Springs, ca. 5.5 mi. S on Hwy 18 from JCT with Hwy 247. One population above spring, one below. Alkaline meadow with <i>Juncus</i> , <i>Distichlis</i> , <i>Glyceria</i> . Spring has been bulldozed to create pond. Area above spring very dry and no plants seen there. PVT.	SBD
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- *U = Unknown*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

Threats

There are no known extant populations within the planning area. However, suitable habitat for *Calochortus striatus* may be vulnerable to grazing impacts within the Rattlesnake Allotment on National Forest System and Bureau of Land Management lands. All *Calochortus* species are vulnerable to removal by collectors, and rare species such as this are vulnerable extirpation as a result. This species is associated with mesic soils in the desert, and is therefore highly vulnerable to habitat loss and degradation resulting from water diversions that affect hydrology. The greatest threats to the viability of this species from activities occurring on National Forest Service lands are effects of Special Use Permits and Plan of Operations water extractions/diversions (USDA Forest Service 2002).

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Calochortus striatus*:

- Determine occurrence status at Pinyon Flats (ANF) and Whiskey Springs (SBNF).
- Survey seeps and springs across the lower slopes of the San Bernardino and San Gabriel Mountains on the NFS land for *Calochortus striatus* and associated rare plants. Record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Calochortus striatus* to document any new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in the last ten years.
- Map known and new occurrences of *Calochortus striatus* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Calochortus striatus is a rare plant peripheral to the lower slopes of San Bernardino and San Gabriel Mountains. Records of this species are near the SBNF, and suitable habitat near these localities exists on the SBNF.

Based on this analysis, *Calochortus striatus* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

Calochortus striatus is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

No populations of *Calochortus striatus* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupported assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Calochortus striatus*.

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Calochortus simulans

**Calochortus weedii var.
intermedius**

Calochortus weedii var. intermedius

Calochortus weedii Alph. Wood var. *intermedius* F. Ownbey (Intermediate mariposa lily, Foothill mariposa lily)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3T2, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Calochortus weedii var. *intermedius* occurs in the San Jose Hills, Puente Hills, and Santa Ana Mountains of Orange, Riverside, and Los Angeles counties (California Native Plant Society 2001).

Distribution in the Planning Area

There is only one record for *Calochortus weedii* var. *intermedius* on the National Forest System land, located at Sierra Peak on the Trabuco Ranger District, Cleveland National Forest. The record is an old 1940 collection and has not been verified since. Further investigation of this record is needed. Many collections of that vintage had very general locations so this record is questionable at best.

Based on recent surveys and compilations of survey results by the Irvine Company, this species occurs on the west side of the Santa Ana Mountains, north of Silverado Canyon. The approximate southern boundary in these mountains appears to be Baker Canyon. The species is known to occur in Baker, Fremont, Limestone, and Black Star Canyons. All of the known populations are at elevations of 800 feet or less. This species is also known to occur on the west side of the San Jacinto Mountains in the vicinity of Lake Skinner. It seems to be associated with Cienaba rock outcrop soils and occurs in coastal sage scrub or chamise (Roberts pers. comm.).

Taxonomy and Natural History

Calochortus weedii var. *intermedius* is an herbaceous perennial in the lily family (Liliaceae) that

overwinters as a bulb, having a fibrous coat. Plants are 30-90 cm and generally branched with withering leaves of 20-40 cm. Plants have 2-6 erect flowers and are distinguished from other varieties by its purplish tinged, rounded petals and rounded anthers (Fiedler & Ness 1993). It is one of three varieties of *Calochortus weedii* that occur in California. Variety *intermedius* is distinguished from varieties *weedii* and *vestus* on the basis of geographic location and floral characters (Fiedler & Ness 1993). Plants flower from May to through June (California Native Plant Society 2001).

Habitat Description

Calochortus weedii var. *intermedius* grows on dry, open rocky slopes in chaparral and coastal scrub at elevations of 390–2,800 feet (120–850 meters) (California Native Plant Society 2001). It commonly occurs in open coastal sage vegetation along ridgelines, and on calcareous soils (Southern California Association of Governments 2001). Associated species include *Yucca whipplei* and *Nassella lepida*. It occurs in valley and foothill grasslands only after burns (Dudek and Associates 2000).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 40 occurrences of *Calochortus weedii* var. *intermedius* (California Natural Diversity Database 2004). On National Forest System lands CNDDDB lists an old unconfirmed siting near Sierra Peak on the Cleveland National Forest (occurrence # 13). There are no other documented occurrences on the CNF. Eight additional CNDDDB occurrences are also old or unconfirmed reports that are presumed to be extant. The majority of the 40 total occurrences are on private lands. Three occurrences are on Orange County lands and two are protected on The Nature Conservancy lands. Population numbers are largely unknown; however, among the occurrences with recorded numbers, populations vary widely between 5 and 8000 plants (California Natural Diversity Database 2004).

OCCURRENCE DATA of *Calochortus weedii* var. *intermedius* (Intermediate Mariposa Lily) on National Forest lands

Occurrence No. (CNDDDB)	CNF Record No.	No. of Plants	Year Reported	Location/Land Owner	County
13	*	U	1940	Sierra Peak / CNF	OR/RIV

- U = Unknown
- * an occurrence number has not been assigned
- CNF = Cleveland National Forest

- RIV = Riverside County
- OR = Orange County

Threats

Populations of *C. weedii* var. *intermedius* on private lands are threatened by development, including transportation corridor development, and nonnative species invasions (California Natural Diversity Database 2004). Plants may be vulnerable to over-collecting and ground disturbance, including grazing and mining, while over-wintering as a bulb (USDA Forest Service 1998). Populations may also be threatened by high fire frequencies, type converting native grasslands into nonnative grasslands (Stephenson and Calcarone 1999).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Calochortus weedii* var. *intermedius*:

- Survey Sierra Peak and other potential habitat on the Cleveland National Forest and incorporate new occurrences into the Sensitive Plant Atlas.
- Allow wildland fires to freely burn through any known occurrences. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. Use ridgelines or base of mountains for fuel break construction. The use of hand line for fuel break construction is preferred.
- Do not develop trails, campgrounds, roads, or other constructed facilities in occupied habitat.

Evaluation of Current Situation and Threats for National Forest System Lands

Calochortus weedii var. *intermedius* status is limited to only one historic location on National Forest System lands, found during a 1940 survey. Much of the accessible area in the Santa Ana Mountains has been surveyed since that time with no additional occurrences documented. Sierra Peak is accessible and available for surveys if any activity is proposed in the vicinity. Potential habitat may be present on the adjacent chaparral covered slopes descending down to the more favorable lower hills and valleys habitat off National Forest System lands.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

The historic occurrence of *Calochortus weedii* var. *intermedius* on National Forest lands may no longer be present. If populations were confirmed on Sierra Peak it would have low to moderate vulnerability on National Forest System lands due the existing communication site and corridor through Sierra Peak. Communication site maintenance or construction of new establishment lines may contribute to ground disturbance to the bulbs and possibly create invasive weed pathways.

Calochortus weedii var. *intermedius* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Calochortus weedii* var. *intermedius*. Variations in land use designations would not alter this current situation and the various emphases of the alternatives would not result in a substantial change in conditions for *Calochortus weedii* var. *intermedius*. *Calochortus weedii* var. *intermedius* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for All Land within Range of the Taxon

Calochortus weedii var. *intermedius* occurs at low elevations in chaparral and grassland habitats of western Orange and Los Angeles Counties. Development, recreation use, dumping, and off-road vehicle use threaten *Calochortus weedii* var. *intermedius* populations at low elevation urban interface areas. There are no recorded extirpated sites. Although populations are reported to be presumed extant, the majority is located on private lands and is threatened by development. *Calochortus weedii* var. *intermedius* is moderate to highly vulnerable to extinction across its range, because of limited occurrences in within urban environments. Only five of the 40 (12.4%) CNDDDB occurrences are protected (California Department of Fish and Game 2004). By maintaining the current distribution of *Calochortus weedii* var. *intermedius* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Calochortus weedii* var. *intermedius* to suffer a decline in its overall distribution.

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Personal Communication

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Calochortus striatus

Calochortus weedii var. vestus

Calochortus weedii var. vestus

Calochortus weedii A.W. Wood var. *vestus* Purdy (Late-flowered mariposa lily)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G3?T2, S2.2 – (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Calochortus weedii var. *vestus* occurs at several dozen scattered locations in the Santa Lucia Ranges and the Santa Ynez Mountains of Monterey, San Luis Obispo, Santa Barbara, and Ventura Counties. Approximately 25 occurrences are listed in the California Natural Diversity Database (2004), of which about half are historical records. Another 20 occurrences are reported from various other sources. There are two areas where this variety is concentrated: the Santa Lucia Mountains in southern Monterey County and the entire south slope of the Santa Ynez Mountains from Hollister Ranch (Arroyo el Builito) to Santa Paula Peak east of Ojai.

Distribution in the Planning Area

Calochortus weedii var. *vestus* occurs on the Los Padres National Forest in the Lion Den Botanical Area (Matthews 1997) and at about nine other nearby locations in the Santa Lucia Mountains and Fort Hunter Liggett (Painter 2004); in the Santa Ynez Mountains at about nine locations; and in the mountains to the west from Ortega Trail near Wheeler Springs, to Howard and Gridley Trails on the either side of Nordhoff Ridge, to Santa Paula Canyon Trail and Santa Paula Peak (Terry Austin, personal communication). There are estimated to be 753 acres (305 hectares) of occupied habitat on the Los Padres National Forest (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Calochortus weedii var. *vestus* is a monocot in the lily family (Liliaceae). Three varieties of *Calochortus*

weedii are recognized; *Calochortus weedii* var. *vestus* is distinguished by the shape and color of its petals and by the abruptly apiculate apex of its anthers (Utech 2002).

Calochortus weedii var. *vestus* is a bulb-bearing perennial herb that flowers June-August (California Native Plant Society 2001). The flowers and fruits are held erect on the slender, usually branched, stem, which grows 1–3 feet (0.3-0.9 meter) tall; the single basal leaf withers as the plant flowers (Fiedler & Ness 1993). The plant is abundant at some sites and uncommon at others and, as with many other species of *Calochortus*, bulbs may remain dormant in unfavorable climatic conditions, causing apparent changes in abundance through time.

Calochortus weedii var. *vestus* appears to have an 'endurer' life history strategy for coping with wildfire. When wildfire occurs, the current year's crop of stems, flowers, fruits, and seeds are generally consumed by fire resulting in a loss of one year's reproductive output. However, the affected plants typically live, the plant's bulbs being sufficiently deep in the soil to survive most fire events. In response to post-fire environmental cues, most populations of *Calochortus* respond the year after a wildfire event with higher than usual percentages of plants producing flowering stems. This results in increased reproductive output and the dispersal of seeds into an environment that for a short period of time will produce less competition from neighboring plants.

Habitat Description

Calochortus weedii var. *vestus* grows in chaparral, and open, dry sites in cismontane and riparian woodland at elevations of 880–6,250 feet (270–1,910 meters), often on serpentinite substrates (Fiedler & Ness 1993, California Native Plant Society 2001). It is also been found on sandstone, siltstone, and shale substrates (Stephenson and Calcarone 1999). Some occurrences of *Calochortus weedii* var. *vestus* are on rocky sites, disturbed areas, road banks, and fuel breaks, suggesting either a tolerance of disturbance, or a lack of tolerance of competition from other plants (Stephenson and Calcarone 1999). The key habitat element for late-flowered mariposa lily may be open, rocky substrates with reduced competition from other vegetation.

Occurrence Status

OCCURRENCE DATA- *Calochortus weedii* var. *vestus* (Late-flowered mariposa Lily)

Occ. #	CalFlora ID	Occ. Size	Date	Location/Owner
1	1099965	?	1960	Red Mountain, e end of Rincon Hills, Ventura Co/Pvt

2	1099719	?	1963	Burn area on Black Mountain se of Ojai, Ventura Co/Pvt
3	1099703 1183416	?	1895	Upper part of Ojai Valley, Ventura Co/Pvt.
4	1099685	?	1944	Pratt Canyon Trail, Ojai Valley, Ventura Co/Pvt
5	1099698 1118169	?	1946	Burn area near Kennedy Canyon, Ventura Co/USFS?
6	1099672	?	?	Upper Murieta Cyn - tributary to Matilija Cyn, Ventura Co/USFS
7	1099693	?	1937 1952	Romero Cyn Rd (2nd collection from foothills back of Montecito just e of Romero Canyon is also attributed to this occurrence) Ventura Co/Pvt
8	1099725	?	1923	Franklin Cyn Trail beyond Carpinteria, Santa Barbara Co/Pvt
9	1118159 1118155 1099670	?	1902 1909 1943 1944 1983	Road to La Cumbre Peak about 0.6 mi e of road to summit, Santa Barbara Co/USFS
10	1099662	?	1939	2 mi w of La Cumbre Peak, Santa Barbara Co/USFS
11	1099650	?	?	Old Man Mountain, Santa Ynez Mts, Santa Barbara Co/USFS
12	1099661 1315695	?	1948 1955	San Marco Pass, just e of summit, Santa Barbara Co/Pvt

13	1099648 1118156	?	1987	Refugio Road near Bald Mtn, 1500 ft. elevation, Santa Barbara Co/USFS
14	1097783	?	1994?	Pozo Hondo Ck, Santa Lucia Mtns on serpentine, Monterey Co/DOD
15	1097776	?	1994?	Silver Peak, Santa Lucia Mtns on serpentine, Monterey Co/USFS
16		?	1994?	Lion Peak, Santa Lucia Mtns on serpentine, Monterey Co/USFS
17	1097763	100	1996	North slope of Burro Mtn, Santa Lucia Mtns on serpentine, Monterey Co/DOD
18	1097778	?	1994?	Three Peaks, Santa Lucia Mtns on serpentine, Monterey Co/USFS? DOD?
19	1097741	?	1994?	Dutra Flat, Santa Lucia Mtns on serpentine, Monterey Co/USFS
20	1092824	?	1994?	Wagner Ck, Santa Lucia Mtns on serpentine, Monterey Co/USFS
21	1097825	24	1992	Lions Den Camp, Santa Lucia Mtns on serpentine, Monterey Co/USFS
22	1099379	?	1954	Sagebrush flat within yellow pine forest, Mount Pinos, Ventura Co/USFS?
23	1097740	?	?	Ridgetops of Alder Creek, Santa Lucia Mtns on serpentine, Monterey Co/USFS, DOD

24	n/a	100	1996	Along Burros Ck SW of Burro Mtn, Santa Lucia Mtns on serpentine, Monterey Co/DOD
25	n/a	100	1996	Near Burro Rd, about 2 mi wsw of Burro Mtn and 1.2 mi nnw of Three Peaks, Santa Lucia Mtns on serpentine, Monterey Co/DOD
n/a	1118163	?	1929	Mountain Drive near Santa Barbara, Santa Barbara Co/Pvt?
n/a	1118161	?	1984	West Camino Cielo, 1 mi w of Santa Ynez Peak, Santa Barbara Co/USFS
n/a	1118154	?	1944	El Camino Cielo, 1 block w of junction w/ Gibraltar Rd, Santa Ynez Mts, Santa Barbara Co/PVT?
n/a	1118158 1118165	?	1958 1965	(upper areas of) Rattlesnake Canyon, Santa Ynez Mts, Santa Barbara Co/PVT?
n/a	1118167 1118168	?	1928 1928	Above Mission Canyon, Santa Ynez Mts, Santa Barbara Co/PVT?
n/a	1118162	?	1963	Across Hwy 1, se of Casa San Julian, se of Lompoc, Santa Barbara Co/PVT?
n/a	1118153	?	1944	Along Jesusita Trail in Mission Canyon, Santa Ynez Mts, Santa Barbara Co/PVT? (same location as 1118167?)
n/a	1318003	?	1965	Cuyama Valley desert scrub, 2700 ft. elev., Santa Barbara Co/Pvt?

n/a	1118166	?	1968	West Camino Cielo, 1 1/2 mi from Hwy 154, Santa Ynez Mts, Santa Barbara Co/PVT?
n/a	1118157	?	1938	Painted Cave Rd near Camino Cielo, Santa Ynez Mts, Santa Barbara Co/PVT?
n/a	1118164	?	1930	Santa Ynez Valley, 2 mi w of Paradise Camp, Santa Barbara Co/Pvt
n/a	1118160	?	1987	Arroyo el Builito, Hollister Ranch, Santa Ynez Mts, Santa Barbara Co/Pvt
n/a	n/a	?	2000	Hollister Ranch, main ridge between heads of Arroyo Builito and Canada de los Panochas
n/a	1617860	?	1985	Along Rd to Hearst Springs on Pine Mtn, 850 m, exposed ocean-facing slope with soil derived from serpentine mixed with rhyolite, SLO Co/Pvt
n/a	n/a	260	2001	Ortega Trail near Wheeler Springs, Ventura Co/USFS
n/a	n/a	?	?	Howard Trail on north side of Nordhoff Ridge, Ventura Co/USFS
n/a	n/a	?	1998?	Santa Paula Peak, Ventura Co/USFS
n/a	n/a	"Tons"	1998?	Santa Paula Canyon Trail, Ventura Co/USFS
n/a	n/a	?	2001	Gridley Trail, Ventura Co/USFS

n/a	n/a	300-400	2002	County Line Road, Sur Sur Ranch, SLO Co/USFS
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Threats

Calochortus weedii var. *vestus* is at risk from road and fuelbreak maintenance, fire suppression, and housing development on private lands.

Conservation and Management Considerations

Implement the following to minimize impacts to *Calochortus weedii* var. *vestus* from road and fuelbreak maintenance.

- Provide information on roadside and fuelbreak plant occurrences to road engineers, road maintenance workers, and fire managers so that to the extent practicable occupied habitat is avoided during maintenance operations.
- Schedule maintenance activities during the period of time that *Calochortus weedii* var. *vestus* is dormant (September – January).

Because *Calochortus weedii* var. *vestus* tends to have a neutral to beneficial response to fire management activities there is no need to include 'avoidance' as a management objective. Strategies that allow *Calochortus weedii* var. *vestus* to experience wildfire like affects would likely benefit the taxon.

The dense chaparral and steep terrain that characterizes much of this plant's range has prevented inventory of many thousands of acres of potential habitat. Most documented occurrences are found along roads or trails where botanists can access the area in order to complete inventories and make collections. Other documented occurrences are derived from post-burn collections where the reduced density of chaparral shrubs allowed easier observation and access. Therefore, it is difficult to gauge this plant's actual distribution within the chaparral matrix. Attempts should be made to survey suitable habitat in the year or two after large wildfires in order to more accurately determine the status of *Calochortus weedii* var. *vestus*.

Evaluation of Current Situation and Threats on National Forest System Lands

Calochortus weedii var. *vestus* has a fairly broad range, from the Santa Lucia Mountains of Monterey County to the Santa Ynez and Topatopa Mountains of Santa Barbara and Ventura counties. Within this range *Calochortus weedii* var. *vestus* occurs primarily in rocky habitats that are relatively immune to current and anticipated land management practices. In areas where *Calochortus weedii* var. *vestus* occurs near roads or fuelbreaks use of the population maps would avoid or minimize impacts from the maintenance of these facilities. Under all alternatives, the distribution and abundance of *Calochortus weedii* var. *vestus* is not likely to be affected.

Based upon the above analysis this species has been assigned the following threat category:

3. Common or widespread in plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Calochortus weedii var. *vestus* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Calochortus weedii* var. *vestus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Calochortus weedii* var. *vestus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Calochortus weedii var.
intermedius**

Calycadenia villosa

Calycadenia villosa

Calycadenia villosa DC (Dwarf calycadenia)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2; S2.1 – very threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-3-3

General Distribution

Calycadenia villosa is known from about 46 occurrences in the central and southern outer South Coast Ranges (Bainbridge 1999, California Natural Diversity Database 2004, Carr & Carr 1993). About four-fifths of the occurrences were recently discovered or rediscovered at or near Fort Hunter Liggett (California Natural Diversity Database 2004) in Monterey County. In addition, a recent discovery of *Calycadenia villosa* was made at Camp Roberts to the northwest of San Luis Obispo (Painter 2004). Another center of distribution for *Calycadenia villosa* is at the north end of the La Panza Range where there are six occurrences known to be extant and a couple of occurrences that have not been observed in many years (Bainbridge 1999, California Natural Diversity Database 2004). The preponderance of unsurveyed potential habitat in San Luis Obispo County is found on private land (Bainbridge 1999) though additional survey work remains to be accomplished on lands administered by the state and federal government.

Distribution in the Planning Area

Calycadenia villosa is reported to occur at three locations south of Highway 58 on the Santa Lucia Ranger District of the Los Padres National Forest. One occurrence is found with Camatta Canyon amole (*Chlorogalum purpureum* var. *reductum*) on the northeast side of the La Panza Range (California Natural Diversity Database 2004) along either side of Red Hill Road (FS road 29S15). A second occurrence is reported from Black Mountain but the plants here have not been collected or observed here since 1957. A third occurrence consisting of two colonies is found near Fernandez Spring – one colony is north of the Forest boundary on private land and the second colony is south of the Forest boundary on National Forest System (NFS) land (Bainbridge 1999).

General surveys of NFS land in this region failed to detect additional occurrences of *Calycadenia villosa* (Bainbridge 1999). These surveys covered wide areas and were generally not conducted using rigorous transect methodology. *Calycadenia villosa* may have been present and undetected in areas covered by this general survey.

Taxonomy and Natural History

Calycadenia villosa is a dicotyledonous plant in the sunflower family (Asteraceae). A member of the tarweed tribe (Madiinae), *Calycadenia villosa* is a very distinctive species in the genus *Calycadenia* and may possess the ancestral chromosome arrangement from which the genomes of most the species in *Calycadenia* were derived (Baldwin 1993).

Calycadenia villosa is a densely long-hairy annual that is up to 16 inches (4 dm tall) with one or few branches ascending from the base. The leaves are rigid, 0.8 to 2 inches (2-5 cm) long, with many at the base but reduced in number upwards. The flowers are in heads with 1-3 per node. The peduncle bracts are many, 0.1 to 0.2 inches (3-6 mm) long, and sometimes conceal the heads. The ray flowers are white to pink and have 1-4 lobes. The central lobe is often narrower than the lateral lobes. Plants found in San Luis Obispo County are much shorter in stature and possibly belong to an undescribed subspecies (forma depressa) (California Native Plant Society 2001, Carr 1977, and Hoover 1970) that is distinct from the plants found in Monterey County (forma erecta). The plants found in San Luis Obispo County are decumbent and branched from the base while plants found in Monterey County generally have a single, erect stem. *Calycadenia villosa* blooms from May to October (California Native Plant Society 2001).

Calycadenia villosa may be a fire follower (Stephenson and Calcarone 1999) though Bainbridge (1999) disputes this premise and presents a cogent argument that suggests that *Calycadenia villosa* is essentially indifferent to the occurrence of wildfire and that soil characteristics are the determining factors responsible for the plant's limited distribution before and after wildfire events.

The pollination ecology of *Calycadenia villosa* is not well understood but it appears that the species is a self-incompatible outcrosser. Bainbridge (1999) observed ground-nesting bees in the vicinity of the three La Panza Range occurrences of *Calycadenia villosa* and other native bees of an undetermined family were observed on the capitula flowers of *Calycadenia villosa*.

Habitat Description

In San Luis Obispo County, Bainbridge (1999) reports that *Calycadenia villosa* occurs "in open areas where native annual forbs are dominant and appear to be the climax vegetation. The soil is slightly acid and fine textured. Adjacent vegetation is annual grassland, blue oak woodland, or chamise chaparral." The elevation range for the four extant occurrences in San Luis Obispo County is 1,130 to 2,075 feet (345-635 meters). This elevation range is more restricted than that reported for *Calycadenia*

villosa in Monterey County [950–4,400 feet (285–1,350 meters)]. Native annual forbs that are typically found with *Calycadenia villosa* include *Clarkia speciosa*, *Navarretia atractyloides*, *Centaureium exaltatum*, *Linanthus liniflorus*, *Micropus californicus*, *Lotus hamatus*, and *Eremocarpus setigerus* (Bainbridge 1999). Subtle habitat components that are difficult to identify but nevertheless important for conservation include habitat for pollinators. Pollinator habitat may be present on site or may be present in nearby stands of vegetation that differ in composition and structure from the vegetation where *Calycadenia villosa* occurs.

Occurrence Status

The status of *Calycadenia villosa* is described in two parts since there is evidence that the plants in Monterey County are sufficiently distinct genetically and morphologically from the plants in San Luis Obispo County to justify designating the two disjunct populations as separate subspecies (Baldwin 1994). The emphasis in this section will be on the plants found in San Luis Obispo County, as this is the only place where *Calycadenia villosa* is found on NFS land.

In Monterey County, at least one historic occurrence of *Calycadenia villosa* was lost when the San Antonio Reservoir was constructed. Recent (1995-1999) work on Fort Hunter Liggett has resulted in the discovery of about 38 occurrences of *Calycadenia villosa* and the combined number of plants documented at those locations is roughly estimated at about 40,000.

One occurrence of *Calycadenia villosa* near La Panza Ranch (Occurrence #1) may have been extirpated by conversion of habitat to grape vineyards and/or facilities for a California Department of Forestry fire station but lack of access to private land precluded a thorough search of the area so this finding is best characterized as tentative until additional surveys are completed (Bainbridge 1999).

For the other occurrences of *Calycadenia villosa* found in San Luis Obispo County there is rough population data for six occurrences (California Natural Diversity Database 2004) and a lack of data for two occurrences: Occurrence #2 – no data due to lack of access, possibly extant; Occurrence #8 – not relocated, status unknown; Occurrence #10 – extant with many thousands of plants in years with good rainfall [Danielsen (1994, 1995, 1996) reported 100,000+ plants in 1994 but only about 1,000 plants in both 1995 and 1996]; Occurrence #11 – extant in 1998 but no numbers given; Occurrences #23 and #24 at Morrison Ranch (formerly Camatta Ranch) – extant with about 1,800 plants in 1998; Occurrence from Upper Shell Creek, along Hernandez Road – about 120 plants in 1998; and Occurrence from Upper Shell Creek, on road to Fernandez Spring – about 530 plants in 1998.

Threats

Threats to this species include both on and off the forest include sheep and cattle grazing, feral pigs, use of artillery, tank traffic, troop maneuvers, urbanization, road development, fire suppression, off-road vehicles, damage to soil crusts, dust, increased fire return intervals, and invasive non-native plants, (Foster 1998, Painter 2004).

The following analysis will only address the threat to plants found in San Luis Obispo County. Occurrences of *Calycadenia villosa* found in Monterey County are apparently secure though some threats do exist and the range of this putative subspecies does only entail a relatively small area of California. Threats to *Calycadenia villosa* on the Los Padres National Forest (Occurrence #11) are derived from use of occupied habitat for cattle grazing and by the presence of Red Hill Road. Red Hill Road bisects the population of *Calycadenia villosa* at this location and affects the species in a number of ways. Loss of habitat here reduces the interactions between the separated colonies of plants and introduces the threat of off-highway vehicle trespass. Road dust may affect *Calycadenia villosa* through physiological stress and by altering the environmental setting for pollination. Off-highway vehicle trespass has been deterred by the placement of a welded-pipe fence along Red Hill Road.

Winter use of occupied habitat by cattle can result in reduced habitat suitability due to soil disturbance, soil compaction, and trampling of microbiotic crusts. Livestock generally are removed from the allotment prior to the flowering period but use of the allotment in the spring may result in direct physical impacts to germinating and growing plants. Deposition of urine and feces on plants may have deleterious effects as well. Current livestock use of occupied habitat is light and there is no apparent downward trend in habitat quality. Removal of livestock grazing may result in a slight upward trend in habitat quality.

Both livestock use and presence of the road contribute to the risk that non-native plant propagules will continue to be introduced into the habitat of *Calycadenia villosa*. Non-native plants can adversely impact *Calycadenia villosa* through competition for space, water, sunlight, nutrients, and pollinators.

Conservation and Management Considerations

- Study the factors that maintain native annual forb communities and determine the effects of grazing, if any, in preventing the domination of native annual forb communities by non-native plants.
- Determine the tolerance of *Calycadenia villosa* to grazing and study the effects of grazing on soil structure, microbiotic crusts, and mycorrhizae.
- Implement measures to prevent further widening of Red Hill road as a result of road maintenance.
- Annually monitor the two occurrences of *Calycadenia villosa* found on National Forest System land to determine trends in population sizes and their relationship to annual variations in rainfall.
- Monitor off-highway vehicle (OHV) use on NFS land to determine if OHV use or trespass is affecting *Calycadenia villosa*.

Evaluation of Current Situation and Threats on National Forest System Lands

Calycadenia villosa is a rare plant with two, disjunct centers of distribution. The plants found in San Luis Obispo County may be taxonomically distinct from those found in Monterey County. In San Luis Obispo County, *Calycadenia villosa* is narrowly distributed in the area north of the La Panza Range and

is found at only about six locations. Two of these locations are on the Los Padres National Forest and a third, though not seen in many years, was also reported from the Los Padres National Forest. Although the amount of habitat for *Calycadenia villosa* is very limited, current activities and uses do not appear to be degrading this habitat and no habitat is expected to be lost under any of the alternatives. In alternatives 2 through 6, the occurrence of *Calycadenia villosa* found on either side of Red Hill Road would be located in the recommended Camatta Botanical Special Interest Area (SIA).

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Calycadenia villosa is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Calycadenia villosa* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Calycadenia villosa* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Calochortus weedii var. vestus

Calyptridium pygmaeum

Calyptridium pygmaeum

Calyptridium pygmaeum Rydb. (Pygmy pussypaws)

Management Status

Federal: None

California: None

Heritage Rank: N/A GX; SX (California Natural Diversity Database 2003)

California Native Plant Society (2001): N/A List XX; R-E-D Code X-X-X

General Distribution

Calyptridium pygmaeum is endemic to the southern high Sierra Nevada and the San Bernardino Mountains (Wilken 1993). It is known from a total of 12 collections, 2 of which are at the University of California, Riverside Herbarium (Sanders pers. comm.).

Distribution in the Planning Area

On the San Bernardino National Forest, *Calyptridium pygmaeum* is known from Arrastre Flat where it was last seen in 1979 by Thorne and Helmkamp. It also occurs on the summit of San Gorgonio. Historical reports include "Bear Valley," reported by Parish and a specimen collection by Munz from Bluff Lake in the 1920s (Sanders pers. comm. Krantz and others 2000).

Taxonomy and Natural History

Calyptridium pygmaeum is a dicotyledon in the purslane family (Portulacaceae). This annual herb blooms from June–July (Munz 1974). Because this species is an annual, it may exhibit high variation in population size and structure as a result of climatic conditions.

Calyptridium pygmaeum is 0.5-8 cm. It has a slender taproot or fibrous roots. The stems are spreading to erect and leafy. The leaves are basal and cauline, 5-1.5 cm, and generally persistent in fruit. The inflorescence is a raceme or panicle that is more or less dense, 0.5-3 cm, and axillary. The bracts are ovate to more or less round. The flowers are persistent in fruit. The pedicels are 1-3 mm. The sepals are 2-4 mm, ovate, fleshy, becoming membranous, and have a margin that is sometimes white. There

are 4 petals that are 2-3 mm and white. There are generally three stamens. The stigmas are sessile. Fruit are 3-5 mm and more or less ovate. There are 5-9 seeds (Wilken 1993).

Habitat Description

Calyptridium pygmaeum occurs at elevations of 7,000–11,500 feet (Munz 1974) [2,100–3,500 meters] (Wilken 1993). This species inhabits dry to moist sandy or gravelly places in lodgepole and subalpine forests (Munz 1974).

Occurrence Status

The California Natural Diversity Database (2002) does not contain any records for *Calyptridium pygmaeum*. There are three occurrences reported from the San Bernardino Mountains; however, little information is available for these occurrences.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Calyptridium pygmaeum* (Pygmy pussypaws)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
*	U	1979	Arrastre Flat. 7500'. SBNF.	SBD
*	U	U	Summit of San Gorgonio. SBNF-San Gorgonio Wilderness.	SBD
*	U	1920s	Bluff Lake. The Wildlands Conservancy.	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Threats to this species are not known. It is possible that vehicle use off of classified roads may be affect the Arrastre Flat occurrence however this location is protected by fencing and monitoring to protect

pebble plain habitat and federally listed species. Trampling by hikers may affect to the San Gorgonio Wilderness occurrence on the summit.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Calyptridium pygmaeum*:

- Survey all new occurrences of *Calyptridium pygmaeum* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Calyptridium pygmaeum* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Calyptridium pygmaeum* in the Province using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System lands

Calyptridium pygmaeum is endemic to the southern high Sierra Nevada and the San Bernardino Mountains (Wilken 1993). It is known from 3 locations in the San Bernardino Mountains, and potential habitat is present. Effects to habitat at Arrastre Flat are expected to be minimal due to existing protection measures in place for listed species on pebble plain and meadow habitat. Occurrences on the summit of San Gorgonio in the Wilderness area may be minimally affected however presence of plants and extent of effects are unknown.

Based on this analysis, *Calyptridium pygmaeum* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Calyptridium pygmaeum* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Calyptridium pygmaeum* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Calycadenia villosa

Calystegia peirsonii

Calystegia peirsonii

Calystegia peirsonii (Abrams) Brummitt (Peirson's morning-glory)

Management Status

Federal: None

State: None

Heritage Rank: G3, S3.2 (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 4, R-E-D Code 1-2-3

General Distribution

Calystegia peirsonii, Peirson's morning-glory, is a perennial species known from occurrences in Los Angeles County in the northern San Gabriel Mountains and adjacent areas of the Mojave Desert (Antelope Valley) (Brummitt 1993).

Distribution in the Planning Area

Calystegia peirsonii occurs on the Angeles National Forest (Stephenson and Calcarone 1999) in an area extending from the old Sierra Pelona lookout site to the Forest Service boundary near Mt. McDill (Bramlet and Boyd 1997). *Calystegia peirsonii* is also found on the recently acquired Knapp Ranch (Boyd and Raz 1997).

Taxonomy and Natural History

Calystegia peirsonii is a dicot in the morning-glory family (Convolvulaceae). It is distinguished from other morning-glories in the San Gabriel Mountains primarily by floral characters (Brummitt 1993). It intergrades with several other species of *Calystegia* (Brummitt 1993). *Calystegia peirsonii* is a perennial rhizomatous herb that blooms April–July (California Native Plant Society 2001).

Habitat Description

Calystegia peirsonii grows on rocky slopes in coastal scrub, chaparral, chenopod scrub, cismontane

woodland, and lower montane conifer forest habitats (California Native Plant Society 2001). Habitat has also been described as open grasslands on the margins of chaparral (Bramlet and Boyd 1997).

Occurrence Status

Calystegia peirsonii occurs in scattered populations and in some places is locally common. There is a single population of *Calystegia peirsonii* at Knapp Ranch of undetermined size with additional unsurveyed habitat in the area (Boyd and Raz 1997). In the Sierra Pelona ridgeline area there is estimated to be at least 61,000 plants (Bramlet and Boyd 1997). Boyd (1999) considers *Calystegia peirsonii* to be widespread and locally common in the Liebre Mountain area.

Threats

No specific risks to *Calystegia peirsonii* on National Forest System lands have been identified. The California Native Plant Society (2001) states that cattle grazing threatens this species. The only grazing occurring on the Angeles National Forest is limited to occasional sheep grazing as a tool to keep vegetation down within fuel breaks.

Conservation and Management Considerations

Calystegia peirsonii was once considered a sensitive plant species but was removed from the Regional Forester's list of sensitive species in 1990 based on its relative abundance and lack of identifiable threats on National Forest System lands. In 1998, *Calystegia peirsonii* was again considered for sensitive species status and was rejected from inclusion on the list due the stable nature of populations found on National Forest System lands.

Evaluation of Current Situation and Threats on National Forest System Lands

Calystegia peirsonii is considered to be at risk of extirpation in a portion of its range but is found in sufficient numbers and wide enough distribution that the potential for extinction is low (California Native Plant Society 2001). Because *Calystegia peirsonii* occurs on National Forest System lands in a wide range of habitats and is often common on disturbed habitats such as fuelbreaks, road cuts, and utility corridors it does not appear to be affected by current and anticipated uses of National Forest System lands.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon in the Plan Area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Calystegia peirsonii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Calystegia peirsonii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Calystegia subacaulis ssp. episcopalis

Calystegia subacaulis H. & A. ssp. *episcopalis* Brummitt (Cambria morning-glory)

Management Status

Federal: Forest Service Watch List; Bureau of Land Management Sensitive

California: None

Heritage Rank: G3T1, S1.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Calystegia subacaulis ssp. *episcopalis* is endemic to San Luis Obispo County (California Native Plant Society 2001) from Cambria and the upper Salinas Valley in the north to San Luis Valley and bordering hills in the south (Hoover 1970, California Natural Diversity Database 2004).

Distribution in the Planning Area

Calystegia subacaulis ssp. *episcopalis* is not known to occur on the Los Padres National Forest but is found just one mile outside the forest boundary at Cuesta Ridge and just southeast of the forest boundary at Camp San Luis Obispo (California Natural Diversity Database 2004). There are also reports tha the taxon is found at California State Polytechnic University, San Luis Obispo (Painter pers. comm.).

Taxonomy and Natural History

Calystegia subacaulis ssp. *episcopalis* is a dicot in the morning-glory family (Convolvulaceae).

Calystegia subacaulis ssp. *episcopalis* is a perennial, rhizomatous herb that flowers April–May (California Native Plant Society 2001).

Habitat Description

Calystegia subacaulis ssp. *episcopalis* grows in chaparral and cismontane woodland at elevations of

200–1,640 feet (60–500 meters) (California Native Plant Society 2001). Hoover (1970) states that *Calystegia subacaulis* ssp. *episcopalis* habitat is, "generally in grasslands, generally in clay soils." However, Hoover (1970) did not distinguish between the two subspecies of *Calystegia subacaulis* so he may have been referring to one or both of the subspecies in his flora.

Occurrence Status

There is no information available regarding the population status of occurrences of *Calystegia subacaulis* ssp. *episcopalis*.

Threats

Calystegia subacaulis ssp. *episcopalis* is considered at risk throughout its range (California Native Plant Society 2001). There are five occurrences of *Calystegia subacaulis* ssp. *episcopalis* (California Natural Diversity Database 2004). The type locality in Cambria has not been relocated since 1926. One occurrence is the future site of a golf course, and water pipeline and cattle grazing and pipeline development threatens three of the other locations. Occurrences of *Calystegia subacaulis* ssp. *episcopalis* at Camp San Luis Obispo are reported to be threatened or possibly threatened by cattle, feral pigs, nonnative plants, military training activities, road maintenance, vehicles, too frequent fires, out of season fires, construction, mines and tailings reclamation projects, trampling, soil compaction, and dust (Painter pers. comm.).

Conservation and Management Considerations

More information is needed to determine if *Calystegia subacaulis* ssp. *episcopalis* does indeed occur on the northern Santa Lucia Ranger District, Los Padres National Forest.

Evaluation of Current Situation and Threats on National Forest System Lands

Calystegia subacaulis ssp. *episcopalis* is endemic to San Luis Obispo County in areas not too distant from National Forest System lands. There are no known occurrences of *Calystegia subacaulis* ssp. *episcopalis* on National Forest System lands but the species may be present on unsurveyed lands in the northern portion of the Santa Lucia Ranger District.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Calystegia subacaulis* ssp. *episcopalis* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is,

therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Calystegia subacaulis* ssp. *episcopalis*.

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Camissonia hardhamiae

Camissonia hardhamiae Raven (Hardham's camissonia)

Management Status

Federal: Forest Service Watch List; Bureau of Land Management Sensitive

California: None

Heritage Rank: G1Q, S1.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Camissonia hardhamiae is endemic to the inner Coast Ranges of San Luis Obispo and Monterey counties (California Native Plant Society 2001, California Natural Diversity Database 2004).

Distribution in the Planning Area

Camissonia hardhamiae is found on the Los Padres National Forest at one location on Hi Mountain on the Santa Lucia Ranger District (CalFlora 2002) and perhaps on the Monterey Ranger District as well (Matthews 1997).

Taxonomy and Natural History

Camissonia hardhamiae is a dicot in the evening primrose family (Onagraceae) (Raven 1993). *Camissonia hardhamiae*, a hexaploid, is presumably derived from the diploid *C. micrantha* and the tetraploid *C. intermedia* (Raven 1969).

Camissonia hardhamiae is an annual herb that flowers in April and May (California Native Plant Society 2001).

Habitat Description

Camissonia hardhamiae grows in chaparral (often chamise chaparral) and cismontane woodland on

sandy, decomposed carbonate substrates, often in disturbed or burned places. The elevation range for *Camissonia hardhamiae* is 790 to 2,000 feet (240-610 meters) according to the California Native Plant Society (2001); however the occurrence at Hi Mountain is found at 3,100 feet so the actual elevation range may be higher than indicated here. Plants are sometimes found associated with soils disturbed by small mammals.

Occurrence Status

Camissonia hardhamiae is known from about thirteen occurrences (CalFlora 2002, California Natural Diversity Database 2004). The status of *Camissonia hardhamiae* on Los Padres National Forest is unknown. Occurrence #1 located just east of Santa Margarita on private land is reported to consist of 100-500 plants. Occurrence #2, located between Santa Margarita and Creston and just north of Occurrence #1, consisted of about 500 plants in 1995. Occurrence #3 is also located in this same general area but its habitat may have been destroyed through the development of a quarry. Occurrence #5 (which includes what used to be considered Occurrence #6), 2 miles west of Shell Creek, was observed in 1980 but no plants were found in 1988. Occurrence #7 in Monterey County was last collected in 1962 and attempts to locate this population in 1982 were unsuccessful. Occurrence #9 is found northeast of Santa Margarita and, along with Occurrence #10, consisted of 200 plants in 1992. Occurrence #11 is found in the same general area as Occurrence #s 9 and 10 and in 1992 consisted of about 200 plants. Occurrences #12 and #13 are found in Monterey County on Fort Hunter Liggett and a total of about 350 plants were observed there in 1995.

Two other occurrences not included in the California Natural Diversity Database are known: one on the road to Hi Mountain Lookout (CalFlora 2002, Keil collection 19117), and one east of Santa Margarita Lake on land administered by the Bureau of Land Management (CalFlora 2002, Keil collection 19117).

Painter (2004) states *Camissonia hardhamiae* occurs and has been vouchered from Camp Roberts and that at Fort Hunter Liggett, specimens were collected during the Fort Hunter Liggett floristic survey.

OCCURRENCE DATA of *Camissonia hardhamiae* (Hardham's camissonia)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1	500 in 1987, 100 in 1992	1992	CALF CANYON, ALONG HIGHWAY 58 JUST EAST OF JUNCTION WITH PARK HILL ROAD, EAST OF SANTA MARGARITA. SEVERAL COLONIES ALONG EITHER SIDE OF HIGHWAY. MAPPED WITHIN THE E 1/4 SE 1/4 SECTION 10 AND THE W 1/4 SW 1/4 SECTION 11. PVT.	SLO
2	1000 in 1985, & 1987, 500+ in 1995	1995	CRESTON ROAD, JUST NORTH OF CALF CANYON/HIGHWAY 58, EAST OF SANTA MARGARITA. 3 COLONIES ALONG ROAD; 1 ALONG HWY 58 JUST WEST OF CRESTON ROAD; TWO ALONG CRESTON ROAD, ABOUT 0.1 AND 0.6 MILES NORTH OF HWY 58.	SLO
3	U	1963	QUARRY 3 MILES EAST OF SANTA MARGARITA. MAPPED ABOUT 1.2 MILES SOUTHEAST OF JUNCTION OF PARKHILL ROAD AND HWY 58 BY CALTRANS (BARKER 1980). M. MCLEOD SUGGESTS ACTUAL SITE IS FURTHER NORTH. SITE MAPPED TO REFLECT UNCERTAINTY.	SLO

5 (includes what was once Occur# 6)	U	1980	ALONG HIGHWAY 58 EAST OF RED EAGLE MINE AND WILSON CORNER, ABOUT 18 MILES EAST OF SANTA MARGARITA. MAPPED ON NORTH SIDE OF HWY ABOUT 2 MILES WEST OF SHELL CREEK. NEAR THE CENTER OF THE E 1/2 NW 1/ SECTION 28.	SLO
7	U	1962	SANDY VALLEY; BIG SANDY ABOUT 1.5 MILES NORTHEAST OF JUNCTION WITH INDIAN VALLEY ROAD, SOUTHWEST OF STOCKDALE MOUNTAIN.	MON
8	100+ in 1987	1987	ALONG PARK HILL ROAD ABOUT 2.4 MILES EAST OF HIGHWAY 58, EAST OF SANTA MARGARITA. EAST SIDE OF ROAD NEAR HEAD OF S-DRAINING TRIBUTARY TO MORENO CANYON. MAPPED WITHIN THE NW 1/4 SW 1/4 SECTION 18.	SLO
9	200	1992	ABOUT 0.6 MILE WSW OF IRON SPRING BETWEEN CRESTON ROAD (HWY 229) AND HUERHUERO CREEK, NORTHEAST OF SANTA MARGARITA. MAPPED ALONG DIRT ROAD NEAR THE CENTER OF THE W 1/4 SECTION 25.	SLO

10	200	1992	ABOUT 1.2 MI SOUTHWEST OF IRON SPRING BETWEEN CRESTON ROAD (HWY 229) AND HUERHUERO CREEK, NORTHEAST OF SANTA MARGARITA. MAPPED ALONG DIRT ROAD WITHIN THE SW 1/4 SE 1/4 SECTION 26 AND THE NW 1/4 NE 1/4 SECTION 35.	SLO
11	200+ in 1992	1992	ALONG CRESTON ROAD (HWY 229) ABOUT 1.7 MILES NORTH OF JUNCTION WITH HIGHWAY 58, NORTH EAST OF SANTA MARGARITA. EAST SIDE OF ROAD, MOSTLY WITHIN THE NE 1/4 SW 1/4 SECTION 35.	SLO
12	< 100 in 1995	1995	MISSION CREEK FLOODPLAIN JUST NORTH OF CONFLUENCE WITH SAN ANTONIO RIVER, FORT HUNTER LIGGETT. CANTONMENT; ABOUT 300 METERS NNE OF CONFLUENCE OF MISSION CREEK AND SAN ANTONIO RIVER, AND 500 M SOUTHWEST OF MISSION SAN ANTONIO DE PADUA AS PER MAP AND DIRECTIONS FROM CENTER FOR ECOLOGICAL MANAGEMENT OF MILITARY LANDS (CEMML).	MON

13	< 250 in 1995	1996	UPPER MILPITAS ROAD ABOUT 0.5 MILE WEST OF JUNCTION WITH MISSION CREEK ROAD, ABOVE MISSION CREEK, FORT HUNTER LIGGETT. TRAINING AREA 6; 900 M WEST OF MISSION CREEK ROAD AND 500 M SE OF COLEMAN RESERVOIR. MAPPED AS PER MAP, DIRECTIONS, AND UTM COORDINATES FROM CENTER FOR ECOLOGICAL MANAGEMENT OF MILITARY LANDS (CEMML).	MON
131109 (UCR)	U	1999	San Luis Obispo, Los Osos, N of the corner of Bockskin & Martingale Streets, elev. 200 ft. (Helmkamp/UCR)	San Luis Obispo

- *U* = Unknown
- * = an occurrence number has not been assigned
- *SBNF* = San Bernardino National Forest
- *RSA* = Rancho Santa Ana
- *RIV* = Riverside County
- *SLO* = San Luis Obispo
- *MON* = Monterey

Threats

Camissonia hardhamiae is threatened by grazing, mining, and proposed road construction in San Luis Obispo County and by military training in Monterey County. Threats and possible threats at Camp Roberts include chemical weed control, fires in wrong season, military training activities, non-native plants, road maintenance, sheep, cattle, trampling, dust, and vehicles (Painter 2004).

On National Forest System (NFS) lands, imprecise knowledge regarding extant locations of *Camissonia hardhamiae* makes it difficult to assess current threats. Dispersed recreation, grazing, and fuels management may affect *Camissonia hardhamiae* habitat.

Conservation and Management Considerations

More information is needed on the Los Padres National Forest occurrences of *Camissonia hardhamiae*. GIS and other resource maps should be used to identify potential carbonate substrates and these areas should be surveyed for *Camissonia hardhamiae*.

Evaluation of Current Situation and Threats on National Forest System lands

Little is known about the locations and status of *Camissonia hardhamiae* occurrences on NFS lands. Because extant populations may be small and susceptible to disturbance from dispersed recreation and grazing, there is a risk that undetected occurrences of *Camissonia hardhamiae* could be impacted by uses of NFS land.

Based upon the above analysis *Camissonia hardhamiae* has been assigned the following threat category:

- 5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
E	E	E	E	E	E	E

Carbonate substrates are not common on the Los Padres National Forest. Little is known about the *Camissonia hardhamiae* on NFS land, but based on off-forest occurrence records and the limited availability of potential habitat, it is likely that any extant populations of *Camissonia hardhamiae* on NFS land would be small in size. *Camissonia hardhamiae* appears to be inherently rare and not naturally well distributed. Stochastic events could result in extirpation of undetected occurrences. The risk of extirpation would be the same under all alternatives.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6

C	C	C	C	C	C	C
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Some occurrences of *Camissonia hardhamiae* appear to have been extirpated and some have been difficult to relocate. Others on private property continue to be threatened by mining and development. Variations in potential impacts to the one or two populations of *Camissonia hardhamiae* found on the Los Padres National Forest by alternative do not affect the overall outlook for this species on all lands where it occurs.

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Canbya candida

Canbya candida C. Parry (Pygmy poppy)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3; S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-3

General Distribution

Canbya candida is endemic to the western Mojave Desert and adjacent mountain slopes in Los Angeles, San Bernardino, Kern, and Inyo counties (Clark 1993, California Native Plant Society 2001). In Kern County, *Canbya candida* is known from near Lake Isabella, Walker Pass, and Kelso Peak/Valley. At least 29 occurrences of pygmy poppy are known; most are located on private lands. Several old collections were made from the Victorville and Hesperia areas in areas likely lost to development. The current version of the Database does not list any occurrences of *Canbya candida* (California Natural Diversity Database 2004). CalFlora (2002) reports several occurrences in San Bernardino, Los Angeles, and Kern counties.

Distribution in the Planning Area

Currently, there is one recorded occurrence of *Canbya candida* on National Forest System lands in the southern California national forests at north fork Little Horsethief Canyon on the SBNF (UCR86165 Sanders). However, potential habitat exists on the Los Padres and Angeles National Forests, and some collection localities may be on National Forest (field work needed to determine). A 1921 collection at Little Rock Creek, if extant, is on the ANF. Old collection localities at Cajon Pass and Cajon Summit, if extant, are likely on the SBNF. In the San Bernardino Mountains, *Canbya candida* is known from Cajon Pass, Horsethief Canyon, Grass Valley Creek at Mohave River, and Deep Creek Campground.

Taxonomy and Natural History

Canbya candida is a dicotyledon in the poppy family (Papaveraceae). This plant is 10-30 mm, tufted,

and more or less glabrous. The leaves are 5-9 mm and fleshy. The inflorescence peduncles are 10-20 mm. Each flower has 3-4 mm petals that close over the fruit. The fruit are 2-2.5 mm and the seeds are 0.6 mm (Clark 1993).

Canbya candida is an annual herb that blooms March–June (California Native Plant Society 2001). Because it is an annual species, it may exhibit high variability according to climatic conditions. Surveyors should take this into account when determining presence/absence of this species.

Habitat Description

Canbya candida is found on sandy, granitic soils, dry rocky areas, and openings in Joshua tree woodlands, pinyon-juniper woodlands, and Mojavean desert scrub habitat, at elevations of 1,970–3,940 feet (600–1,200 meters) (California Native Plant Society 2001; USDA Forest Service 2002). It also occurs in areas with disturbed soils, such as fuelbreaks, areas within residential tracts, and roadsides (USDA Forest Service 2002).

Joshua tree woodland, pinyon-juniper woodland, and Mojavean desert scrub are well distributed within the plan area; however, most of these habitats on National Forest lands occur above the 1,970-3,940' elevational range for *Canbya candida*. This habitat is threatened by development, too-frequent fire (and associated increase in invasive annual grasses), and recreational activities.

Occurrence Status

No information is available on current population trends.

The status of the single recently-recorded occurrence on the SBNF at upper Horsethief Canyon is not known, but this area burned in the Old Fire in 2003 and may be affected by use and maintenance of the PCT and of forest road 3N22. Portions of Little Horsethief Canyon are under mining claim and habitat for this species may be impacted by small-scale gold mining.

The following table shows the recorded occurrences in/near the Planning Area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Canbya candida* (pygmy poppy)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
*UC472852 (SMASCH)	U	1917	Cajon Pass. (Spencer/UC) Land owner: U (Possibly SBNF).	SBD

*	U	1939	Kramer Flat, between Hinkley and Mojave Desert. Land owner: U.	SBD
*UC126480 (SMASCH)	U	1906	Fremont's Peak near sand hills of Black's Ranch, Mojave Desert. (Hall/RSA) Land owner: U.	LA
*	U	1914	Kramer Mojave Desert. Land owner: U.	SBD
*	U	1935	Horsethief Canyon. Land owner: U.	SBD
1819247 (CalFlora)	U	1893	Mojave Desert, Lancaster. Land owner: U.	LA
*1819248 (CalFlora)	U	1941	Mojave Desert, Big Rock Creek Rd. Land owner: U.	LA
*	U	1926	Little Rock Creek, Mojave Desert. Land owner: U.	LA
*1819246 (CalFlora)	U	1929	Mojave Desert: Redman to Muroc. Land owner: U.	LA
*	U	1967	Hunt Canyon, T5NR11WSec19. Elev. 3500 ft. (Wheeler/RSA). Pvt. (but adj. to ANF)	LA
*	U	1995	Bob's Gap, San Andres Rift Zone, 165th St, 1.4 mi. S of Crystalar Dr. (Mistretta/RSA). Priv.	LA
*	U	1926	6 mi. W of Rock Ck. (Pierson/RSA). Ownership: U.	LA
*	U	1994	Three Sisters Buttes, T5NR8WSec2N1/2NE1/4 Sec 16. Elev. 3155-3170 U. (Ross/RSA)	LA

60823 (UCR)	U	1986	Mojave Desert:Hwy 138, 4 mi E of jct. w/ Hwy 18, NE of Pinyon Hills. U. (Boyd/RSA)	SBD
JEPS51657 (SMASCH)	U	1921	Little Rock Creek, 3400' north base of San Gabriel Mts. (Pierson/RSA). ANF	LA
*	U	1903	Cajon Pass, 3800' (Jones/RSA). SBNF	SBD
*	U	1882, 1905	Cajon Pass Summit (Parish/RSA) (Davis/RSA). SBNF	SBD
102489 (UCR)	U	1992	San Bernardino Mts., vicinity of Grass Valley Creek along Hwy 173; E of jct with Hwy 138. S (SE) side of road, T3N/R4W/S26, elev. 3050 ft. (Pitzer/UCR) //	SBD
26560 (UCR)		1982	Grass Valley creek at jct with the Mojave River at Hwy 173 (Anderson/UCR)	
47053 (UCR)	U	1987	Mojave Desert, Lucerne Valley, 2 mi. S of Hwy 18 at a point 4.4mi E of intersection with Bear Valley Rd, T4N/R1W/S16 & 21, elev. 3000 ft. (Pitzer/UCR)	SBD
40206 (UCR)	U	1980	Near Mohave river, S of Hesperia and 5.2 mi. N of junction of Silverwood Lake and Hesperia Rds. (Thorne/ UCR)	SBD
19063 (UCR)	U	1952	Kramer Hills, elev. 2800 ft.	SBD

10194 (UCR)	U	1970	Ca. 2.5 mi. N of Deep Creek Public Campground (SE of Hesperia), (Pidot/UCR)	SBD
86165 (UCR)	U	1995	Upper Horsethief Cyn. Along the Pacific Crest trail, below crossing of Forest Service Rd. to Cleghorn Ridge, T3/R5W/S29, elev. 3772-3963 ft. (this is actually the N fork of Little Horsethief Cyn.) SBNF. (Sanders/UCR)	SBD
91304 (UCR)	U	1995	Ca. 8 mi. NW of silver Lakes, near headwaters of Buckthorne Cyn. Wash, ca. 1.5 mi. E of Hwy 395, (Moore/UCR)	SBD
46150 (UCR)	U	1986	Pinon Hills, First wash on Smoke Tree Rd., e of Hwy 138 (Harper/UCR)	LA

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*
- *RIV = Riverside County*

Threats

Canbya candida is threatened by development and competition with nonnative plant species (California Native Plant Society 2001). Potential threats include significant ground disturbance from recreational activities, road and trail maintenance and construction, small scale gold mining and associated dispersed use, and ongoing development of the major utility and transportation corridor through Cajon Pass. Too frequent fire with an increasing prevalence of cheatgrass, and the effects of fire suppression are also threats. Poor knowledge of this species distribution is also a threat.

Conservation and Management Considerations

The primary short-term conservation strategy for *Canbya candida* is to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Survey all new occurrences of *Canbya candida* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Canbya candida* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Canbya candida* in the plan area using NRIS data collection standards.

Evaluation of Current Situation and Threats on National Forest System Lands

Canbya candida is a poorly known rare species sparsely scattered through the western Mojave Desert and adjacent hills. It is recorded historically on (or adjacent to) National Forest land from a few collection localities and collected recently only once on National Forest System land. None of these localities are well protected from identified threats. Continuing development of the Cajon Pass transportation and utility corridor, recreation at Little Rock Creek, and PCT and road use and maintenance and mining at Little Horsethief Canyon are the most likely threats of Forest Service management.

Based on the above analysis, *Canbya candida* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	B	B	C	B

Canbya candida is a USDA, Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level. Occurrences on National Forest Lands are peripheral to the primary distribution of this species.

The primary threats to this species on NFS lands are associated with developed recreation, roads and

trails, and non-recreation special uses (utilities). If this species has persisted on NFS lands at historic localities, under all alternatives this species would be at continued risk as a result of high demand for further development of the utility corridor at Cajon Pass. The Critical Biological zoning at Little Rock Creek on the ANF (under all Alternatives except 5) is important for the only historic record on the Angeles. The Critical Biological zoning at Little Horsethief under Alternatives 2, 3, 4, 4a, and 6 includes suitable habitat for this species near the recorded occurrence at north fork Little Horsethief Canyon. Increased extent of non-motorized zoning in Alternatives 3, 4a, and 6 may provide some benefit. The priority for improving the level of knowledge of this species, as well as the response time and effectiveness of impact identification and resulting management, are expected to be greater under Alternatives 3 and 6.

Consideration of Standards regarding roads and recreation factor into these outcomes. The Critical Biological zoning at Little Rock Creek and Little Horsethief Canyon are important to the determinations.

Viability Outcomes for all Lands within Range of Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

Major portions of this species range have likely been lost and continue to be lost as private land in the western Mojave is urbanized. The potential for extirpation of this species across portions of its range on private lands is high, making conservation on NFS more important for the species as a whole.

By maintaining the current distribution of the *Canbya candida* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause the *Canbya candida* to suffer a decline in its overall distribution.

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Camissonia hardhamiae

Carex obispoensis

Carex obispoensis

Carex obispoensis Stacey (San Luis Obispo sedge)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Carex obispoensis is endemic to Monterey and San Luis Obispo counties (Mastrogriuseppe 1993, Keil 1999). Numerous occurrences are reported for this species at Cuesta Ridge, Lopez Ridge, the Nacimiento River watershed, and as far north as Arroyo de los Chinos (CalFlora 2002, California Natural Diversity Database 2004, Keil and McLeod 1987, Painter 2004). One occurrence has been reported from Monterey County in the Willow Creek watershed, about 0.5 miles east of Hwy 1 (Keil 1999).

Distribution in the Planning Area

Carex obispoensis occurs on the Los Padres National Forest on Cuesta Ridge, from the vicinity of the TV towers to northwest of Cerro Alto (California Natural Diversity Database 2004), and in Willow Creek near Willow Creek Road and Hwy 1. Another occurrence near Rinconada Mine, in the Salinas River watershed on the lower, northeast facing slopes of the southern Santa Lucia Mountains, is on or near National Forest System lands (California Natural Diversity Data Base 2004).

Taxonomy and Natural History

Carex obispoensis is a monocot in the sedge family (Cyperaceae).

Carex obispoensis is a rhizomatous perennial graminoid herb that blooms April–June (California Native Plant Society 2001). It forms clumps that are up to 39 inches (1 meter) tall.

Habitat Description

Carex obispoensis grows in Sargent cypress forest, chaparral, coastal scrub, and coastal prairie below elevations of 2,600 feet (790 meters) (California Native Plant Society 2001). It occurs on serpentinite in the Santa Lucia Mountains and on both ultrabasic and marine terrace substrates in the Arroyo de la Cruz area (California Natural Diversity Database 2004, Keil and McLeod 1987). *Carex obispoensis* is most often found on clay soils or in seasonally moist soils (Keil and McLeod 1987).

Occurrence Status

Except for the location on Cuesta Ridge there is little data available on the abundance of *Carex obispoensis* at any given location. Occurrence # 10 on Cuesta Ridge consists of at least 1,000 plants. This population is well distributed and consists of at least eleven discrete colonies. *Carex obispoensis* was surveyed on Cuesta Ridge Botanical Area after the HWY 41 fire (Painter 2004). A twelfth colony (Occurrence # 14) of *Carex obispoensis* is found about 3 miles to the northwest at Cerro Alto but there is no information on the size or vigor of this occurrence nor is there any site specific information on the status of *Carex obispoensis* at Rinconada Mine. In describing the status of *Carex obispoensis* in the Arroyo de la Cruz endemic area, Keil and McLeod (1987) state, "large clumps of San Luis Sedge (*Carex obispoensis*) occur in some sites" and the species "is rather widespread on the ridge systems both north and south of Arroyo de la Cruz... and in places it is the dominant plant." An accompanying map shows twelve colonies of *Carex obispoensis* distributed throughout much of the study area. On land managed by the City of San Luis Obispo (Irish Hills), there is an occurrence of *Carex obispoensis* in more-or-less open flats of chaparral and the plants here are fairly common (Havlick pers. comm.). The occurrence in Monterey County is located adjacent to the Willow Creek Road and this area is subject to some dispersed recreation use in the form of camping and hiking.

OCCURRENCE DATA – *Carex obispoensis*(San Luis Obispo sedge)

CNDDDB Occ.# or voucher #	CalFlora ID	Occ. Size	Date	Location (Collector)/Owner
1	1098177	U	1969	NE slopes of Red Mountain in extirpated Sargent Cypress Grove, San Simeon Creek (Hardham), SLO Co/Private
2	1817106	U	1960	Burnett Peak Cypress Grove, headwaters of Tobacco Creek (Hardham), SLO Co/Private

3	1097940	U	1984	On N slope of ridge no of Arroyo de los Chinos, 0.5 mi NW of Yellow Hill VABM 481, SLO Co/ Hearst Corp.
4	1097970	U	1984	E of Hwy 1, 1.25 mi N of Arroyo de la Cruz, just E of Yellow Hill, SLO Co/Hearst Corp.
5	1098010	U	1981	NNW slope of ridge below VABM Cinnabar, s of Arroyo de la Cruz, SW of gaging station, SLO Co/Hearst Corp
6	1098046 1339472	U	1981 1987	On ridge S of Arroyo de la Cruz, about 0.5 mi SW of VABM Cinnabar (Ertter, Keil, Hickman, Sholars, et al. 6835), SLO Co/Hearst Corp
7	1098060	U	1981	Near E end of E-W ridge of VABM La Cruz, south of Arroyo de la Cruz, SLO Co/Hearst Corp
8	1098014	U	1947	Just north of Arroyo de la Cruz on Hwy 1, SLO Co/Hearst Corp & CalTrans
9	1098041	U	1950	Just south of mouth of Arroyo de la Cruz (Hoover 7951), SLO Co/Hearst Corp
10	1816278 1820210 1199693 1820215 803303 1098603 895388 1343677 1819667 119251	1000+	1960 1963 1964 1968 1971 1984 1985-95 1989 1989 1991	Cuesta Ridge West, about 2-4 miles NW from Cuesta Pass (Hoover 11392), (Piehl 6374), (Hoover 8731), (Smith 10094), [Cuesta Ridge Botanical Area (Junak 1991)], (Young 1847), (Junak 4405), SLO Co/LPNF

11	1098607 1819252 1820211 1820213	U	1977 1990 1992 1993	At Pick and Shovel Mine 0.75 mi W of TV Tower NW of Cuesta Pass near Chorro Creek [along dirt rd. to Pick & Shovel Mine (Junak 4324)], (Young & Johnson), (Johnson & Proctor), SLO Co/DOD
12	1098702	U	1959	Stenner Creek, N of SLO, SLO Co/Unknown
13	1098812	U	1977	Just north of Rinconada Mine (Hoover 6115), SLO Co/LPNF
14	1817107 1098486	U	1963 1977	NW slope of Cerro Alto (Hardham 10741), SLO Co/LPNF
16		U	1938	Perfumo Canyon (Eastwood & Howell 5931), SLO Co/Private
17	1098096	U	1985	Upper Arroyo del Corral, NW of San Simeon, SLO Co/Hearst Corp.
18	U	U	2001	EAST END OF IRISH HILLS, ALONG PREFUMO CANYON ROAD NEAR HEAD OF COOK CREEK, SOUTHWEST OF SAN LUIS OBISPO. IN WET OPENINGS. MAPPED WITHIN THE NW 1/4 OF THE SW 1/4 OF SECTION 2, T31S/R11E/S02
19	U	U	1999	WILLOW CREEK ROAD ABOUT 0.25-0.5 MILE EAST OF HIGHWAY 1, EAST OF CAPE MARTIN, LOS PADRES NATIONAL FOREST. ON NORTHWEST FACING SLOPE.

20	U	U	1987	NORTH SIDE OF BIG CREEK ALONG NATURE TRAIL, SHADED LOCATION ALONG TRIBUTARY TO BIG CREEK. EXACT LOCATION UNKNOWN; MAPPED AS BEST GUESS BY CNDDDB NORTH OF BIG CREEK IN VICINITY OF INTERPRETATIVE TRAIL, T21S/R03E/S23
n/a	1820214	U	1993	Chorro Creek, 1 km N of Chorro Reservoir, on Camp San Luis Obispo (Johnson & E.A. Young), state property.
n/a	1820212	U	1980	Hearst Ranch, ca. 1 mi E of Hwy 1 (Keil 14038), SLO Co/Hearst Corp
n/a	n/a	U	?	Reservoir Canyon E of San Luis Obispo (Keil and McLeod 1987), SLO Co/Private
20149 (UCR)	U	U	1979	San Luis Obispo, Eagle Ranch Land Exchange, along Cuesta Ridge Rd. just W. of Rasio facility, Cuestan Ridge Botanical Area, T29S/R12E/S20 (Krantz/UCR)
29176 (UCR)	U	U	1979	San Luis Obispo, Reservoir Cyn., upper N-facing serpentine slopes under <i>Quercus agrifolia</i> (Keil/UCR)
136 (SBBG)	U	U	U	Camp San Luis Obispo, which abuts LPNF. Maps available from Camp Roberts Environmental Office (Painter 2004).

195 (SBBG)	U	U	U	Camp San Luis Obispo, which abuts LPNF. Maps available from Camp Roberts Environmental Office (Painter 2004).
1766 (OBI)	U	U	U	Cuesta Ridge Botanical Area (Brown)
U (UCSB)	U	U	U	Cuesta Ridge Botanical Area (Fairfax)
3051 (SBBG,RSA)	U	U	U	Cuesta Ridge Botanical Area (Hardham)
8436 (OBI,RSA)	U	U	U	Cuesta Ridge Botanical Area (Hoover)
4324 (SBBG,OBI)	U	U	U	Cuesta Ridge Botanical Area (Junak)
228 (OBI)	U	U	U	Cuesta Ridge Botanical Area (Prescott)
10094 (SBBG)	U	U	U	Cuesta Ridge Botanical Area (Smith)
32159 (RSA)	U	U	U	Cuesta Ridge Botanical Area (Thorne & Everett)
23 (OBI) & 47 (OBI)	U	U	U	Cuesta Ridge Botanical Area (Wiese)

- *U* = *Unknown*
- * = *an occurrence number has not been assigned*
- *RSA*=*Rancho Santa Ana*
- *LPNF* = *Los Padres National Forest*
- *SBBG*=*Santa Barbara Botanic Garden*
- *UCSB* = *University of California Santa Barbara*

Threats

Vulnerability of *Carex obispoensis* on National Forest System lands is moderate (Stephenson and Calcarone 1999). Populations on Cuesta Ridge may be affected by activities within communications rights-of-way and by access roads (California Natural Diversity Database 2002). Other potential threats

on National Forest System lands include impacts from trampling by dispersed recreation activities (hikers, picnickers, mountain bikers), competition from nonnative plants, and mining. Proposals for special use permits would receive environmental analysis prior to approval.

On private land in the Arroyo de la Cruz endemic area, grazing by livestock does not appear to have an adverse impact on *Carex obispoensis* (Keil and McLeod 1987).

Threats and possible threats at Camp San Luis Obispo include erosion from mines and tailings, mines and tailings reclamation projects, road repair and maintenance, non-native plants, use of non-local plant materials in revegetation projects, cattle, feral pigs, feral goat, too frequent fires, fires in wrong season, military training activities, trampling, dust, and proposed pipeline construction (Painter 2004).

Conservation and Management Considerations

More information about distribution and potential threats on National Forest System lands is needed for *Carex obispoensis*.

Evaluation of Current Situation and Threats on National Forest Systema Lands

Carex obispoensis is restricted to a narrow range of serpentine habitats in northern San Luis Obispo County and southern Monterey County and within this narrow range, where *Carex obispoensis* is found, habitat is at risk from a variety of land uses including dispersed recreation, road use and maintenance, invasive non-native plants, communication site management, and potentially by fuel management.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	C	B	C	B

Carex obispoensis is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Under alternatives 1, 2, 3, 4, 4a and 6, habitat for *Carex obispoensis* would be of sufficient quality, distribution, and abundance to allow the species population to remain stable or stabilize, well distributed across NFS land. Under all alternatives, known occurrences of *Carex obispoensis* would be located in a Back Country land use zone with one exception – the occurrence found near Cerro Alto would, under alternatives 3 and 6, be located in a Back Country Non-Motorized land use zone. Under all alternatives, about half of the habitat for *Carex obispoensis* that is found on National Forest System lands would be within the established Cuesta Ridge Botanical Special Interest Area (SIA) and this designation would provide substantial protection for the plants found within the SIA. In Alternatives 2-6, use of Standard S33 would add additional protection when new projects are proposed.

Alternative 4 could create a higher level of recreational impacts to *Carex obispoensis* habitat over the long-term because the focus would be on sustaining the recreation resource by maintaining or expanding facilities at a moderate rate with less emphasis on sustainable dispersed recreation. Under Alternative 4a, it is expected there would be less recreational effects to habitat than in 4. In 4a, the recreation emphasis would be to sustain the setting through management of dispersed recreation and to maintain or expand existing facilities prior to constructing new ones at a low rate. Under alternative 5, increased emphasis on motor vehicle based recreation would likely result in higher use and impacts in occupied habitats that are found outside of the SIA. Both authorized and unauthorized uses would degrade habitat. This higher use, in combination with fuels management, could fragment habitat. Under Alternative 5, any increase in motorized road or trail densities in occupied habitat would result in further habitat loss. Habitat for *Carex obispoensis* would be isolated relative to historic distribution.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

The combination of environmental (habitat) and population conditions allows the species population to remain stable or stabilize, but with significant gaps in the historic species distribution. These gaps are due to habitat loss resulting from urbanization and these gaps cause some limitations in interactions among populations. Stability in the distribution of *Carex obispoensis* is due in part to protection afforded occurrences on land managed by the City of San Luis Obispo and by the California State Polytechnic University, San Luis Obispo.

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Canbya candida

Carlquistia muirri

Carlquistia muirri

Carlquistia muirri (A. Gray) B. G. Baldwin (Muir's raillardella)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2, S2.3 – (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Carlquistia muirri is known from 20 occurrences that range across an estimated 200-mile (322-kilometer) section of the southern Sierra Nevada in Fresno, Tulare, and Kern Counties. One disjunct occurrence is found on the Los Padres National Forest 160 miles (257 kilometers) to the west in the Ventana Wilderness in Monterey County (Stephenson and Calcarone 1999).

Distribution in the Planning Area

Carlquistia muirri occurs at one site at Ventana Double Cone in the Ventana Wilderness Area on the Los Padres National Forest. The plants are found on the east side of the old lookout site (unpublished data on file, Frazier Park, Calif.). All other occurrences are in the Sierra Nevada on National Forest System lands (10 sites on the Sierra and Sequoia National Forests), Bureau of Land Management land (one site in Kern County), and National Park lands (eight sites in Sequoia and King's Canyon National Parks) (California Natural Diversity Database 2004).

Taxonomy and Natural History

Carlquistia muirri is a dicot in the sunflower family (Asteraceae). This species is treated as *Raillardiopsis muirri* in The Jepson Manual (Baldwin 1993), but was placed in the monotypic genus *Carlquistia* as a result of recent studies of this and related genera of tarplants (subtribe Madiinae) (Baldwin 1999).

Carlquistia muirri is a rhizomatous perennial herb. The plants have woody rhizomes that combine with

flowering stems and densely leaved vegetative shoots to form mats up to 2 feet across. The heads of *Carlquistia muirii* are all discoid and the bisexual disc florets flower from early June to early October. *Carlquistia muirii* is strongly self-incompatible (Baldwin and Kyhos 1990).

Carlquistia muirii is restricted to granitic substrates though it may have been found on a wider range of substrates in the past. Its current restriction to sites with little vegetative cover may indicate poor competitive ability due to paleoendemism or depleted ecotypes (Baldwin and Kyhos 1990).

Carlquistia muirii is an 'avoider'- it has no obvious adaptations for coping with fire. Plants such as *Carlquistia muirii* that grow in scree or talus habitats avoid fire altogether as there is insufficient fuel to carry a fire through its habitat.

Habitat Description

Carlquistia muirii occurs in dry open sites on granitic soils at elevations of 3,600-8,200 feet (1,100–2,500 meters) (Baldwin 1993). It grows from granite ledges and crevices and on gravelly or sandy flats in openings of montane chaparral, ponderosa pine forest, and lower and upper mixed conifer forest (California Native Plant Society 2001). At Ventana Double Cone, the habitat is granitic scree and bedrock crevices with little other vegetative cover (Baldwin and Kyhos 1990) and the elevation is 4,850 feet.

Associates include *Dudleya cymosa*, *Eriogonum nudum*, *E. saxatile*, *Garrya flavescens*, *Penstemon breviflorus*, *Pellaea mucronata*, *Pinus ponderosa*, *Polystichum munitum*, *Potentilla glandulosa*, *Pteridium aquilinum*, *Quercus chrysolepis*, and *Q. kelloggii*.

Occurrence Status

Carlquistia muirii is known from 20 occurrences ranging from three to 590 plants. Around one-third of the occurrences have 100 plants or more (California Natural Diversity Database 2004). The species' habitat is generally undisturbed and free of nonnative undesirable plants, and overall population trends are apparently stable (Clines and others 1998). Populations in the Sierra Nevada have also been assessed as stable on the basis of habitat and population conditions (Powell and Blackwell 2001). The population on the Los Padres National Forest contained approximately 100 plants in 1986 (California Natural Diversity Database 2004) and was described as 'vigorous' (Baldwin and Kyhos 1990). The species is not considered vulnerable to extinction under current conditions (California Native Plant Society 2001).

Threats

The Los Padres National Forest occurrence of *Carlquistia muirii* is not subject to any known threats (California Natural Diversity Database 2004).

Conservation and Management Considerations

Conserve existing population and protect any newly discovered occurrences. Potential habitat is found only within the Ventana Wilderness. The risk of adverse impacts from land use in this area is low.

Evaluation of Current Situation and Threats on National Forest System Lands

There is a disjunct occurrence of *Carlquistia muirii* in the Ventana Wilderness and this occurrence is not threatened by any current or anticipated management activities.

Based upon the above analysis *Carlquistia muirii* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Carlquistia muirii is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Carlquistia muirii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Carlquistia muirii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

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Carex obispoensis

Castilleja cinerea

Castilleja cinerea

Castilleja cinerea A. Gray (Ash-gray paintbrush)

Management Status

Federal: Federally Threatened

California: None

Heritage Rank: G2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

There is no Critical Habitat designated or proposed for this species.

General Distribution

Castilleja cinerea is endemic to the San Bernardino Mountains (California Natural Diversity Database 2004), and is usually associated with pebble plain habitat.

Distribution in the Planning Area

The California Natural Diversity Database (2004) records 33 occurrences of *Castilleja cinerea*, all of which are on or adjacent to the San Bernardino National Forest. Plants are distributed from Holcomb Valley in the north to South Fork Meadows in the south, and from Snow Valley and Fish Camp east to Onyx Peak (USDA Forest Service 2000). Plants occur on numerous pebble plain complexes within the San Bernardino National Forest and adjacent areas and also off typical pebble plain habitat at the north shore of Big Bear Lake, City of Big Bear Lake, Baldwin Lake and on Grinnell Ridge in the San Gorgonio Wilderness (USDA Forest Service 2002).

Thirty-three occurrences are recorded in the California Natural Diversity Database (California Natural Diversity Database 2004); additional occurrences are known on the SBNF (USDA Forest Service 2002). In addition, local herbarium records are included in the table below. Several herbaria records from UCR provided through Painter (2004) are still being verified and have not been included to date.

Taxonomy and Natural History

Castilleja cinerea is a dicotyledon in the broom-rape family (Orobanchaceae) (APG II 2003). This species blooms from May to August, but principally in June and July. Its phenology varies considerably from early blooming plants on the eastern pebble plains to later blooming plants on the western sites.

Castilleja cinerea is a hemiparasitic perennial herb that blooms June-July (California Native Plant Society 2001). The plant is a green-root parasite on various shrubby species, including *Eriogonum kennedyi* var. *austromontanum*, *Eriogonum kennedyi* var. *kennedyi*, *Eriogonum wrightii* var. *subscaposum*, *Artemisia tridentata*, *Artemisia nova*, and other *Artemisia* species (USDA Forest Service 2000).

Pollination and genetic studies completed on *Castilleja cinerea* by Freas (1988) found that little genetic material was exchanged between pebble plain occurrences. Pollen transfer was observed at distances of less than four meters and seed dispersal was limited to about five meters from a pebble plain edge. Seed dispersal was measured using seed traps and seed movement by animals was not addressed (Freas 1988).

Castilleja cinerea is described by Chuang and Heckard (Hickman 1993) as an: Annual to subshrub, green root-parasites. The leaves are sessile, entire to dissected, while the inflorescence is spike-like; bracts becoming shorter, wider, more lobed than leaves, tips generally colored. The flowers generally unequally 4-lobed, generally colored like bract tips, while the corolla upper lip beak-like, tip open, lower lip reduced, 3-toothed to pouched; anther sacs 2, unequal; stigma entire to 2-lobed, generally exserted. The fruit is loculicidal, more or less ovoid and asymmetric. The seeds are generally brown, attached at the base, and the coat is netted, with net-like walls sometimes aligned ladder-like.

Castilleja cinerea is highly variable in inflorescence color, both within and among sites. For example at Sawmill, inflorescences vary from a bright greenish yellow to a rather dull crimson red as a result of varying levels of anthocyanin pigments. Similar variation in flower color can be seen at other sites. A general trend is seen going from northwest to southeast, where yellow and yellow-green inflorescences appear to be more frequent to the north and west while red inflorescences are more frequent to the south (particularly near Sugarloaf Ridge). Inflorescence size also appears to decrease from north to south. Individuals from Sugarloaf Ridge have shorter, uniformly maroon bracts and reduced inflorescences.

Castilleja cinerea is easily distinguishable from other species of *Castilleja* in the area by the yellow color of the spike, the equal length of the calyx lobes, and has an included corolla and short beak, and is bee-pollinated (Painter 2004). However, *Castilleja plagiotoma* also possesses a yellow-green inflorescence when dry, but has an exserted corolla and a long beak, and is hummingbird-pollinated (Painter 2004). Close observation may be necessary to distinguish dried specimens of the two. *Castilleja lasiorhyncha* is also present within the range of *Castilleja cinerea*, but it is readily differentiated by *C. lasiorhyncha*'s conspicuous yellow pouches on the corolla and its annual life cycle.

Habitat Description

Castilleja cinerea inhabits clay soils and pebble plains, in dry meadows, and in openings within conifer forest, pinyon-juniper woodlands, and Mojavean Desert scrub at elevations of 5,850-9,200 feet (1,800-2,835 meters) (California Native Plant Society 2001). There are no documented occurrences below 6,700 feet.

Castilleja cinerea is not strictly limited to pebble plains. It also occurs on clay soils not associated with pebble plains. Like other endemic species, it is patchily distributed within a pebble plain. In a study of microhabitat differences at Sawmill pebble plain, Derby (1979) found *Castilleja cinerea* to be more common on northwest exposures; this taxon was absent from sample plots on southwest exposures. It was also not present in sample plots in the understory of western juniper trees, though it occurred in low densities in open areas of the pebble plain.

Occurrence Status

Populations on National Forest System lands remain vulnerable and are declining although the rate of decline has been reduced through a variety of measures to prevent impacts to individual plants and habitat. Implementation of recommended protection measures described in the Pebble Plain Habitat Management Guide and an increase in public education and research are expected to continue to slow the rate of decline (USDA Forest Service 2002).

The following table shows the recorded occurrences within the planning area, the number of plants reported to be present, and the general location of these occurrences. More precise mapping and distribution data is available at the Big Bear Ranger Station, San Bernardino National Forest.

OCCURRENCE DATA – *Castilleja cinerea* (Ash-gray paintbrush)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1980	N shore of Baldwin Lake, Bear Valley. PVT ORV's, dumping, and weeds could threaten this population. Annually moist alkaline meadow w/ <i>Distichlis</i> , <i>Iva axilla</i> , <i>Arenaria ursina</i> , <i>Poa atropurpurea</i> , <i>Thelypodium stenopetalum</i> , <i>Arabis parishii</i> , <i>Artemisia arbuscula</i> , <i>Poa scabrella</i> , <i>Hordeum</i> , <i>Carex</i> . California Fish and Game. E end of Bear Valley around	SBD

39372 (UCR)		1980	Baldwin Lake. North Shore in sec. 31, near old Doble Cemetary (LaPre/UCR)	
2	50	1983	Cienega Seca near Onyx Peak, San Bernardino Mtns. In meadow/forest ecotone in heavy soil w/ Saragosa quartzite gravel. Associated w/ <i>Pinus jeffreyi</i> , <i>Juniperus occidentalis</i> . Also w/ <i>Taraxacum californicum</i> , <i>Poa atropurpurea</i> . The Wildlands Conservancy.	SBD
3	U	1979	Onyx Peak, from summit down NNW slope to ca. 8500 ft. w/ <i>Linanthus killipii</i> , <i>Arabis parishii</i> , <i>Arenaria ursina</i> , <i>Ivesa argyrocoma</i> , <i>Phlox dolichantha</i> . Threats at this site likely include burro grazing, trampling, and vehicle activity. PVT at summit, rest in SBNF.	SBD
4	U	1979	Ridge ca. 2 air mi. WNW of Onyx Peak. w/ <i>Arabis parishii</i> . SBNF.	SBD
5	U	1979	Hwy 38 at Onyx Summit, ca. 0.5 air mi. W of Onyx Peak along Hwy 38. SBNF.	SBD
6	U	1978	Mapped ca. 2.0 air mi. E of Onyx Peak along FR 1N01. On pebble plain w/ <i>Arenaria ursina</i> , <i>Arabis parishii</i> , <i>Ivesia argyrocoma</i> , <i>Phlox dolichantha</i> , <i>Eriogonum wrightii</i> . SBNF.	SBD

7	U	1988	N and W of Sugarloaf, from NE edge of Moonridge to NE edge of Sugarloaf. On pebble plains in the Sugarloaf area growing w/ <i>Arenaria ursina</i> , <i>Eriogonum kennedyi austromontanum</i> , <i>Arabis parishii</i> , <i>Ivesia argyrocoma</i> , <i>Linanthus killipii</i> , <i>Phlox dolichantha</i> . ORV use, burro activity, development and invasive weeds are threats. TNC, SBNF.	SBD
8	U	1988	S and E of the town of Sugarloaf. Pebble plain surrounded by conifer forest. Rare associates = <i>Ivesia argyrocoma</i> , <i>Eriogonum kennedyi austromontanum</i> , <i>Arabis parishii</i> , <i>Arenaria ursina</i> . Pebble plain near water tank to S of town has been nearly denuded of vegetation due to ORV activities. SBNF.	SBD
10	U	1977	Woodlands, 0.3 mi. ESE from intersection of Willow Lane and Meadow Lane. <i>Castilleja cinerea</i> is in the smaller, NW polygon. Land owner: U.	SBD
11 1335 (UCR)	U	1984 1960	Erwin Lake. In rocky flat on Erwin Lake Road. Land owner: U. // Erwin Lake Rd., south and east of Big Bear Valley, elev. 6800 ft (Vasek/UCR)	SBD

12	U	1978 2004	Sugarloaf Ridge, from summit east to ridge north of Wildhorse Spring, San Bernardino Mtns. Soils of white quartzite on red or darker alluvium. w/ <i>Pinus murrayana</i> , <i>Pinus flexilis</i> , <i>Juniperus occidentalis</i> , <i>Abies concolor</i> , <i>Cercocarpus ledifolius</i> , <i>Arabis parishii</i> . Some ORV damage on the summit east of Wildhorse Meadow. Grazing has been allowed along FR 2N93. SBNF.	SBD
13 20124 (UCR)	U	1977 2004 1978	Wildhorse Spring, ca. 0.1 mi. NW of spring. SBNF. // Sugarloaf Peak, opening on ridge top E of Wildhorse Meadow, 1N/R2E/S3 (Krantz/UCR)	SBD
14	U	1977	Along ridge near Wildhorse Spring, from 0.7 mi. S to 0.5 mi. SE of spring. SBNF.	SBD
16	U	1924	Ridge to W of Lost Creek at 9000'. Other herbarium label: 'summit of main divide between Lost Creek and S Fork of the Santa Ana River.' Needs fieldwork. SBNF.	SBD
17	U	1988	S of Big Bear Lake, Aspen Glen Picnic Area NW to Presbyterian Conference Grounds. Meadow plant community interdigitated w/ <i>Pinus jeffreyi</i> on clay soils. Dominants = <i>Artemisia arbuscula</i> , <i>Ranunculus californicus</i> , <i>Viola douglasii</i> , <i>Achillea</i> . Also w/ other rare plant taxa. TNC site is subject to trampling and dumping. SBNF and Priv.	SBD

18	U	1979	S of Big Bear Lake, 0.2 km (0.1 mi.) W of Big Bear High School. Needs fieldwork. Land owner: U.	SBD
19	U	1988	Eagle Point, Big Bear Lake. Primarily meadow habitat with small areas of pebble plain species. <i>Pinus jeffreyi</i> forest surrounds area. w/ several other rare pebble plain and meadow plants. Current threats include invasive weeds, ORV use and trampling. Most of the original habitat has been lost to development. PVT. Area to be managed by TNC.	SBD
20	U	1978	Pine Knot, ca. 0.25 mi. N of campground, Big Bear Lake. Small pebble plain w/ <i>Arenaria ursina</i> , <i>Ivesia argyrocoma</i> , <i>Phlox dolichantha</i> . Tract upon which site is located was reviewed for residential development in 1978 by USFS. Outcome unknown. SBNF.	SBD
21	U	1977	Snow Point E of Red Ant Canyon, Big Bear Lake. Unknown development could threaten. Associated w/ several other rare plants. SBNF.	SBD

22	U	1988	Holcomb Valley Area, including NW slope of Bertha Peak. Small pebble plains dominated by <i>Eriogonum kennedyi austromontanum</i> , <i>Arenaria ursina</i> , <i>Ivesia argyrocoma</i> . Other species includes <i>Arabis parishii</i> and several other rare plants. Road bisects one pebble plain. Some ORV disturbance. PVT (Boy Scouts)/SBNF.	SBD
23	U	1977	Upper Holcomb Valley, ca. 0.7 mi. ENE of Old Baldy Council Camp. Many other sensitive spp. SBNF.	SBD
24	U	1979	Fawnskin, on N side of Hwy 38 just E of town, San Bernardino Mtns. On dense clay w/ quartzite cobbles. w/ <i>Arabis parishii</i> , <i>Ivesia argyrocoma</i> , <i>Eriogonum wrightii</i> in <i>Pinus jeffreyi</i> series. Unknown development could threaten. (Moon Camp)	SBD
25	U	1977	N shore of Big Bear Lake, ca. 0.5 air mi. W of Stanfield Cutoff on Hwy 38. Land owner: SBNF	SBD
26	U	1979	Castle Glen, SE of Big Bear Lake. Associated w/ <i>Arabis parishii</i> , <i>Arenaria ursina</i> , <i>Astragalus leucolobus</i> , <i>Mimulus exiguus</i> , <i>Mimulus purpureus</i> , <i>Castilleja lasiorhyncha</i> , <i>Phlox dolichantha</i> , <i>Packera bernardina</i> . PVT.	SBD

27	U	1977	Arrastre Flat and Union Flat area. ca. 2.5 mi. N of Big Bear City. w/ <i>Arenaria ursina</i> , <i>Arabis parishii</i> , <i>Eriogonum kennedyi austromontanum</i> , several other pebble plain plant spp. SBNF.	SBD
28	U	1979	Just S of Jacoby Spring, ca. 1 air mi. N of Doble Mine, San Bernardino Mtns. Growing w/ <i>Eriogonum kennedyi austromontanum</i> . Needs fieldwork. SBNF.	SBD
29	U	1988	Johnston Grade, ca. 1 air mi. E of Doble. Pebble plain w/ overstory of <i>Artemisia</i> sp., <i>Pinus monophylla</i> , <i>Juniperus occidentalis</i> . Associates include <i>Arenaria ursina</i> , <i>Eriogonum kennedyi austromontanum</i> , <i>Arabis parishii</i> , <i>Echinocereus engelmannii</i> , <i>Astragalus leucolobus</i> . Slight evidence of trampling and burro grazing. Old roads on western edge of occurrence. SBNF.	SBD
30	U	1988	SE slope of Gold Mtn. ca. 1 air mi. SE of summit overlooking Baldwin Lake. Dirt road crosses both pebble plains. Some ORV damage, weeds (<i>Bromus tectorum</i>) evident on lower plain. Two pebble plains surrounded by pinyon-juniper woodland. Associated w/ <i>Arenaria ursina</i> , <i>Eriogonum kennedyi austromontanum</i> , <i>Arabis parishii</i> , <i>Ivesia argyrocoma</i> , <i>Echinocereus engelmannii</i> , <i>Linanthus killipii</i> . SBNF.	SBD

31 31796 (UCR)	U	1979	E of Big Bear City, near Pan Hot Springs. Precise location unknown. Probably occurs NE of Pan Hot Springs on N side of Hwy 18 in association w/ <i>Arabis parishii</i> . Big Bear City Community Service District owns property at Pan Hot Springs. CSD/SBNF. // W side of Baldwin Lake near Pan Hot Springs, elev. 6725 ft. (Krantz/UCR)	SBD
32	U	1979	Big Bear City, N side of Hwy 18, ca. 1.3 air mi. W of Big Bear City Post Office. Growing among <i>Artemisia tridentata</i> , <i>Juniperus occidentalis australis</i> in <i>Pinus jeffreyi</i> forest. Appears to be somewhat parasitic on <i>Artemisia</i> roots. Land owner: U.	SBD
33	U	1979	S of Mallard Lagoon, S shore of Big Bear Lake. Unknown development has extirpated most habitat for this species along the south shore. Other threats = grazing, weeds. Small meadows fed by annual springs on sandy loam soils. Growing with <i>Pinus jeffreyi</i> , <i>Artemisia tridentata</i> , <i>Carex</i> , <i>Salix</i> , <i>Sidalcea pedata</i> , <i>Packera bernardina</i> , <i>Perideridia parishii parishii</i> . A few small pockets along Lakeview Dr., at Lagunita Lake near Canvasback Road and in springy areas near Talmadge. PVT >	SBD

34	50-100 in 1989; 50-75 in 1994	1994	Grinnell Ridge near Lost Creek Trail, ca. 0.5 mi. E of Poopout Hill. ca. 150' S of trail after last big turn before reaching Grinnell Ridge Campground. Plants are ~100 m NW of unnamed 8132' peak. Mixed conifer forest w/ <i>Abies concolor</i> , <i>Pinus jeffreyi</i> . w/ <i>Artemisia ludoviciana</i> , <i>Lupinus</i> , <i>Eriogonum wrightii</i> , <i>Poa pratensis</i> , <i>Elymus elymoides</i> , <i>Erigeron</i> , <i>Tetradymia canescens</i> , <i>Lotus nevadensis</i> , <i>Achillea</i> . Small threat of hikers trampling plants. San Gorgonio Wilderness. SBNF.	SBD
35	U	1975	N of Hwy 18 across from Snow Valley Ski Area. The population occurs on S-facing banks opposite the ski area and above an intermittent stream, between several of the homes on the W side of a large, dry meadow, and in front and back of the Helter Skelter Ski Club. Seven patches observed. Smallest patch w/ 1 plant. Occurs w/in <i>Pinus jeffreyi</i> series w/ <i>Arctostaphylos pungens</i> , <i>Eriogonum wrightii</i> , <i>Ceanothus cordulatus</i> , <i>Lupinus breweri grandiflorus</i> , <i>Eriastrum densifolium</i> , <i>Madia elegans</i> , <i>Iris missouriensis</i> , <i>Achillea</i> , <i>Pteridium</i> , <i>Lotus argyrophyllus</i> . Vehicular use of cabin/ski club area and some trash strewn about. Population otherwise undisturbed. SBNF.	SBD

400536 (RSA)	U	1976	On St Hwy 18,SBNF. Cushenbury Grade Summit. Elev. 6750 ft. T2N R2E S 5/6 34°17'18"N 116°48'45"W (Davidson)	SBD
400527 (RSA)	U	1978	Baldwin Lake, 3 miles E of Big Bear City. Broad, level area at the north end of the "T"-shaped lake. (Davidson)	SBD
189681 (RSA)	U	1966	Nelson Ridge, about 1/2 mile north Baldwin Lake. T.2.N., R.2.E., Sec. 5. Elevation 7000 ft.	SBD
337792 (RSA)	U	1979	Holcomb Valley; along Holcomb creek below Hitchcock Ranch, where 3N12 crosses the creek; elev. ca. 7150 feet.	SBD
337800 (RSA)	U	1979	Margin of Big Bear Lake at E end on S side W of Big Bear City. Elev. ca. 6750 ft.	SBD
*	U	2004	Doble Trail Camp south to Highway 18, east to Nelson Ridge and north to county dump substation. Threatened by trampling and OHV activity. (VinZant/USFS)	SBD
*	5000	2004	Along closed E spur of 2N93, near Wildhorse Meadows. In old roadbed and on slopes directly north of road. (VinZant/RSA)	SBD
*	U	2004	Coldbrook Campground. Several locations within camp area.	SBD
108791 (UCR)	U	1997	E of Holcomb Valley: union Flats, alongside USFS Road 3N02, T3N/R1E/S23, elev. 7350 (White/UCR)	SBD

17498 (UCR)	U	1979	San Bernardino 1 mi. N. of Baldwin Mine (Vasek/ UCR)	SBD
23298 (UCR)	U	1981	¾ mi. W of Sawmill Cyn. & 1 mi. W of Sugarloaf, T2N/R1E/S23. elev. 7134 (Ciano/UCR)	SBD
74549 (UCR)	U	1992	City of Big Bear Lake, SE corner of intersection of Fox Farm Rd. & Garstin Rd, T2N/R1W/S21, elev. 6800 ft. (White/UCR)	SBD
20123 (UCR)	U	1979	Bear Valley. N. of Hwy 18 at foot of old Gold Mt. T2N/R1E/S12, elev. 6750 ft. (Krantz/UCR)	SBD
20068 (UCR)	U	1979	Fawnskin. N side of Hwy 18 just E of Fawnskin T2N/R1W/S13, elev. 6750 ft. (Krantz/UCR)	SBD
80523 (UCR)	U	1992	Hwy 18 above Baldwin Lake, where Pacific Crest Trail crosses Hwy T2N/R2E/S5, elev. 6800 ft. (LaRue/UCR)	SBD
27122 (UCR)	U	1982	N side of Baldwin Lake, in a swale on the S side of Hwy 18. T2N/R2E/S6, elev. 6750 ft. (Krantz/UCR)	SBD
130788 (UCR)	U	1999	San Bernardino, Big Bear Valley, South side of Baldwin Lake, Palomino Dr. ca. ¼ mi. N of Shay Rd. at entrance to wastewater treatment facility, proposed expansion area, T2N/R2E/S7, elev. 6720 (Sanders/UCR)	SBD
15077 (UCR)			(Sanders/UCR)	

- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *RSA= Rancho Santa Ana*
- *UCR= University of California Riverside*

Threats

Some of the original pebble plain habitat was destroyed upon the creation of Big Bear Lake. Residential and commercial development and other high-impact land uses have also contributed to habitat loss; this development continues today.

On National Forest System lands, *Castilleja cinerea* populations are declining due to increased recreation use, existing roads and trails bisecting habitat, road and trail maintenance, mining, prospecting, and unauthorized uses such as off road driving by motorized and mechanized vehicles, cattle trespass at Broom Flat, target shooting, dumping and fuel wood collection. Continued use of improvements such as developed recreation sites, and lands under special use permit completed in the past also degrades habitat. Sediment removal after the January 2005 flooding events at the Snow Valley Ski Area may have extirpated the habitat within the enclosure (Eliason pers. comm.). The introduction and spread of invasive nonnative species also degrades habitat (USDA Forest Service 2002).

Despite these impacts, the rate of habitat decline on the Forest has decreased due to recent and ongoing habitat protection measures. Although impacts could not be entirely eliminated, barriers and signs have been installed to direct recreational use within the footprint of the sites and to educate the public as to why these measures are needed. Eight road segments affecting pebble plain habitat were decommissioned in 1999 and a full time resource officer was hired for the Big Bear area of the SBNF. This has resulted in timely fence repairs, rapid disguise of user created roads and trails as they are developed and an increase in public environmental awareness. Special use events previously located in habitat have also been relocated or the events have been modified to eliminate effects. The designation of specific locations for target shooting and closure of the Mountaintop District to dispersed shooting, and the 1998 removal of burros from the Big Bear City area has also reduced impacts to this species. The Forest continues to work with the BLM to confine grazing within the allotment area. The Pebble Plain Habitat Management Guide was updated in 2002, and Forest-level planning was conducted to explore methods to protect habitat over the long term in the Forest Plan Revision.

Pebble Plain habitat also faces a new threat. With the recent drought induced death of conifers on the forest, some locations of occupied habitat on NFS lands adjacent to housing communities, developed recreation sites, or sites under special use permit are in need of treatments to reduce fuel loading. Proposed fuel treatments within the Wildland Urban Interface defense and threat zones at these locations could cause direct or indirect affects to habitat. In most instances, vegetation management with pebble plain habitat can usually be avoided due to the low continuity of a large fuel bed, however removing

vegetation adjacent to habitat increases the potential for unauthorized motorized access. This is a substantial concern for defense zones constructed adjacent to communities of Big Bear Lake, Big Bear City, Baldwin Lake, and Fawnskin where unauthorized motorized use is an ongoing factor in habitat degradation. With the concern for wildland fire, comes the increased potential for emergency fuelbreak construction adjacent to housing communities and within areas that are located further in to the forest to connect into the fuelbreak system. Emergency fuelbreak construction can cause a high degree of long term damage within a very short period of time.

Without knowing and including the full extent of the potential Wildland Urban Interface threats, habitat conditions on NFS lands should improve over time as long as the recommendations in the SBNF Pebble Plain Habitat Management continue to be implemented, and the long-term beneficial effects of the Pebble Plain Biological Opinion action items are realized.

Conservation and Management Considerations

The primary conservation strategy for *Castilleja cinerea* is to implement the Pebble Plain and Meadow Habitat Management Guides and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Implement the Pebble Plain and Meadow Habitat Management Guides.
- Utilize the habitat suitability criteria and detection protocol developed for this taxon and apply to surveys at the project level. This will help to ensure that future projects and management actions with effects to this taxon will trigger the appropriate standards, even where occurrences are currently not known.
- Survey all new occurrences of *Castilleja cinerea* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Castilleja cinerea* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Castilleja cinerea* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Castilleja cinerea is a locally-common narrow endemic species known only to occur in the eastern San Bernardino Mountains, almost entirely on pebble plain habitat. Some of this pebble plain habitat is protected from identified threats, although most others are not well protected. A large number of threats have been mitigated but will remain ongoing. The long-term effects of proposed fuel treatments are unknown.

Based on the above analysis, *Castilleja cinerea* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	A	A	C	A	C	A

Castilleja cinerea is listed under the Endangered Species Act of 1973, as amended, as threatened, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level. The viability of this species is entirely tied to protection and management of pebble plain habitat. Existing protections afforded this species under the Endangered Species Act provide considerable baseline protection.

Consideration of the Suitable Use restricting vehicle travel to Forest System roads and trails, along with Standards related to listed plant management, mining, and recreation management factor into the outcomes. The recommended Arrastre and Wildhorse Research Natural Areas, the Gold Mountain, and South Baldwin Ridge Critical Biological zones, the recommended Sugarloaf Wilderness, where applied, are important to the outcomes; some of these are essential for favorable viability outcomes. Presumed implementation of the Pebble Plain Habitat Management Guide is key to these outcomes under all alternatives. To provide for viability and recovery of this species, some of the most important habitat for this species must be clearly and substantially protected.

Under all alternatives approximately 727 of the 1,643 acres of occupied habitat would continue to be protected within the North Baldwin Lake Holcomb Valley Special Interest Area (SIA). One acre could continue to receive protection within the existing San Gorgonio Wilderness in all alternatives. Under alternatives 2-6 this taxon would receive increased protection within the North Baldwin Lake Holcomb Valley Special Interest Area due to Standard S33 that ensures protection of habitat through environmental analysis when new projects are proposed. Also under alternatives 2-6, SBNF Standard S2 would provide an increased level of protection for pebble plain habitat and SBNF Standard S1 would protect host plants of *Castilleja cinerea*. Under alternatives 2-6 a large occurrence of *Castilleja cinerea* located at the non-operational Snow Forest Ski Area would receive increased protection as this special use permit is discontinued. Thirty five acres of occupied habitat would be located within eligible wild and scenic river designations under alternatives 2, 3, 4, 4a, and 6.

Under Alternative 1, pebble plain habitat in general, and in particular, *Castilleja cinerea* will continue to be at risk from unauthorized vehicle travel off Forest Transportation System roads and trails. Conservation actions completed under the Southern California Conservation Strategy and its ongoing

monitoring requirements would be retained. There would be no new Special Area designations. The current levels of Back Country zoning would remain.

Under Alternative 2, the Gold Mountain and South Baldwin Lake Critical Biological zones, the Arrastre and Wildhorse recommended candidate Research Natural Areas, the recommended Sugarloaf wilderness (small alternative) and Back Country Non-Motorized zoning on the north side of Sugarloaf would provide substantial protection for this species.

Under Alternative 3, the Union, Gold Mountain and South Baldwin Lake Critical Biological zones, the Arrastre and Wildhorse recommended Research Natural Areas, and the recommended Sugarloaf wilderness (large extent) would provide substantial protection for this species. Seventeen acres of occupied habitat would be recommended as an extension to the Bighorn Wilderness in the Broom Flat area. An increase in Back Country Non-Motorized zoning would occur.

Under Alternative 4, the recommended Sugarloaf wilderness (full extent) would provide protection for a large portion of the species range, however the important protections associated with Research Natural Area designations and the Gold Mountain and South Baldwin Lake Critical Biological zones would not occur. Current levels of Back Country zoning would remain about the same. Additions to the Bighorn Wilderness (Heartbreak Ridge) are not recommended.

Under Alternative 4a, The Gold Mountain and the South Baldwin Lake Critical Biological zones, the Arrastre Flat and Wildhorse Meadow Research Natural Areas, increased acres of Back Country Non-Motorized and Back Country Motorized Use Restricted zoning would provide a higher level of protection for this taxon. Seventeen acres of occupied habitat would be recommended as an extension to the Bighorn Wilderness (Heartbreak Ridge) in the Broom Flat area.

Under Alternative 5, land use zoning would not provide any protection, nor are any Special Area designations recommended. Due to the projected rise of motorized use, this alternative would be expected to increase the ongoing degradation from motorized and mechanized travel.

Under Alternative 6, increased use of Back Country Non-Motorized zoning across the range of the species including within the Broom Flat occurrence, use of Back Country Motorized Use Restricted zoning, recommendations for the Arrastre and Wildhorse Research Natural Areas, the Union and Gold Mountain Critical Biological zones, and the Sugarloaf proposed wilderness (large extent) would provide substantial protection.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

The pebble plain habitat for *Castilleja cinerea* on private lands in Big Bear Valley has been highly reduced and fragmented by residential and commercial development. There are a few locations under long-term management on state lands however the remaining fragments on private land will continue to be lost as continued development occurs. This loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF. By maintaining the current distribution of *Castilleja cinerea* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Castilleja cinerea* suffer a decline in its overall distribution, however the population conditions of *Castilleja cinerea* on private land will likely result in the loss of populations.

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Carlquistia muirri

Castilleja gleasonii

Castilleja gleasonii

Castilleja gleasonii Elmer (Mount Gleason indian paintbrush)

Management Status

Federal: Forest Service Sensitive

California: Rare

Heritage Rank: G2Q S2.2 - threatened

California Native Plant Society (2001): List 1B R-E-D Code 3-2-3

General Distribution

Castilleja gleasonii is endemic to the western San Gabriel Mountains (Chuang and Heckard 1993, Stephenson and Calcarone 1999) and the Liebre Mountains.

Distribution in the Planning Area

Fewer than 10 occurrences of *Castilleja gleasonii* are known, all located on the Angeles National Forest. The primary distribution is at Messenger Peak/Flat, Mount Gleason, Lightning Point Campground, and east to Chilao, Horse Flats, and the Little Rock Creek area of the San Gabriel Mountains (Mistretta and Brown 1987). In the Liebre Mountains, a population was recently identified to be present at Knapp Ranch, a recently acquired parcel of land (Boyd and Raz 1997), and several more occurrences were found to the west of Knapp Ranch, in upper Cienaga Canyon, and at the west end of Liebre Mountain at the saddle between Liebre Gulch and Salt Creek (Boyd 1999).

Taxonomy and Natural History

Castilleja gleasonii is a dicot in the broomrape family (Orobanchaceae) (APGII 2003). Its taxonomic position within the genus has not yet been fully resolved. It is morphologically indistinct from *C. pruinosa* but may have had an independent origin as a hybrid between *C. affinis* ssp. *affinis* and *C. foliolosa* (Chuang and Heckard 1993). According to Weatherwax, *Castilleja gleasonii* is a hybrid (Painter 2004).

Castilleja gleasonii is a hemiparasitic perennial herb that blooms May-June (California Native Plant

Society 2001).

Habitat Description

Castilleja gleasonii is usually found in areas of open yellow pine woodland (e.g., ponderosa pine, Jeffrey pine, and Coulter pine [*Pinus ponderosa*, *P. jeffreyi*, *P. coulteri*]) with a well-developed shrub or subshrub understory (Mistretta and Brown 1987). It can also be found growing with bigcone spruce (*Pseudotsuga macrocarpa*), white fir (*Abies concolor*), Parry's manzanita (*Arctostaphylos parryana*) and chaparral whitethorn (*Ceanothus leucodermis*) (Stephenson and Calcarone 1999). The Messenger Flat occurrence is found primarily in a mixed live oak/yellow pine habitat that grades into chaparral. Plants at Lightning Ridge grow at the interface of conifers and chaparral. Occurrences at Mount Gleason grow with one of the narrow-leaved bedstraws (*Galium angustifolium* ssp.) and prickly phlox (*Linanthus californicus*) (Mistretta and Brown 1987, Stephenson and Calcarone 1999). At Knapp Ranch, *Castilleja gleasonii* is found in atypical habitat - here the site is open, xeric chaparral. Like all *Castilleja* species, *Castilleja gleasonii* is hemiparasitic on other plants. Associations are formed with big sagebrush (*Artemisia tridentata* ssp. *tridentata*), wild buckwheats (*Eriogonum* spp.), and other native species (Mistretta and Brown 1987). The elevation range of the species is from 5,000 to 7,100 feet.

Occurrence Status

Castilleja gleasonii is distributed in several highly restricted occurrences and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). Population trends for this species are not known. This species is known from seven general areas: Chilao/Horse Flats, Lightning Ridge, Little Rock Creek, Messenger Flats, Mount Gleason, and North Fork Pacoima Canyon, and Liebre Mountain, all on the Angeles National Forest. A total of at least 3700 individuals were observed in 1987 during surveys of all known populations except the North Fork Pacoima Canyon site (Mistretta 1994a, Mistretta and Brown 1987).

OCCURRENCE DATA – *Castilleja gleasonii* (Mount Gleason indian paintbrush)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	1000 to 10,000 in 1987	1987	ALONG CHILAO CREEK & NORTH TRIBUTARY RUNNING NORTH & SOUTH OF HORSE FLATS CAMPGROUND, ANGELES NATIONAL FOREST. ELEVATION RANGES FROM 5300 TO 5800 FEET. MAPPED WITHIN SECTIONS 14, 15, 22 AND 23.	LA

2	1200 in 1987	1986	MT GLEASON ROAD ABOUT 0.8 MI SOUTHEAST TO ABOUT 1 MILE EAST OF MT. GLEASON SUMMIT, ANGELES NATIONAL FOREST. FIVE COLONIES ALONG ROAD FROM JUST NORTH OF MICROWAVE TOWER TO 0.6 AIRMILE NE OF MICROWAVE TOWER, T03N/R12W/S06	LA
3	792 in 1987	1987	SOUTHWEST SLOPE OF MT GLEASON, ALONG MENDENHALL ROAD IN VICINITY OF DEER SPRING AND MT. GLEASON CAMPGROUNDS, ANGELES NF. 6 COLONIES SCATTERED ON RIDGE IN EAST-WEST DIRECTION. ON BOTH SIDES OF ROAD FROM DEER SPRING CAMPGROUND SOUTH ABOUT 1.4 MILES, T03N/R12W/S07	LA
4	1200 in 1987	1987	SOUTH FORK LITTLE ROCK CREEK, 0.2 TO 0.6 MILE NORTH OF ALDER SADDLE JUNCTION, NORTH OF HILAO FLAT, ANGELES NF. TWO COLONIES MAPPED MOSTLY IN THE N 1/2 OF SECTION 11. EASTERN COLONY IS ALONG UNNAMED TRIBUTARY TO SOUTH FORK, T03N/R11W/S11	LA

5	200 in 1987	1987	NORTH SLOPE OF MESSENGER PEAK EXTENDING EAST TO VICINITY OF MESSENGER FLATS, RIDGE WEST OF MT. GLEASON. MOSTLY ALONG THE PACIFIC CREST TRAIL. MAPPED WITHIN THE S 1/2 OF THE SW 1/4 OF SECTION 36.	LA
6	100 to 1000 in 1987	1987	ON PACIFICO MTN ROAD BETWEEN CAMP ROSENITA & CAMP HIDDEN VALLEY, 0.4 AIRMI NNE OF MT. HILLYER SUMMIT, SAN GABRIEL MTNS. ON BOTH SIDES OF PACIFICO MOUNTAIN ROAD. MAPPED AT THE INTERSECTION OF SECTIONS 10, 11, 14 AND 15.	LA
7	U	1976	ALONG FOREST SERVICE ROAD 3N17 AT ENTRANCE TO HIDDEN VALLEY SCOUT CAMP, 2 MILES WEST OF ROUTE 2.	LA
8	75 in 1987	1987	1.3 MILES SOUTH OF MT. GLEASON CAMPGROUND ON MENDENHALL RIDGE ROAD, SOUTH OF MT. GLEASON, ANGELES NF. AT SUMMIT AND NORTH SLOPE OF 5846' ELEVATION HILL ON THE SOUTH SIDE OF MENDENHALL RIDGE ROAD. MAPPED WITHIN THE N /4 OF THE SE 1/4 OF SECTION 12.	LA

9	U	1995	NORTH SLOPE OF WEST FORK BARE MTN CANYON, ABOUT 0.25 MI WEST OF CONFLUENCE WITH BARE MTN CANYON, SAN GABRIEL MOUNTAINS. MAPPED ABOUT 0.15 MILE UPSLOPE (NORTH) OF WEST FORK CANYON, T04N/R11W/S22	LA
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- *U* = Unknown
- * = an occurrence number has not been assigned
- *SBNF* = San Bernardino National Forest
- *LA* = Los Angeles County

Threats

The primary threat to *Castilleja gleasonii* is its preference for habitat that is also popular for human recreation activities (i.e., gentle slopes and an open understory) (Mistretta and Brown 1987). Occurrences are reportedly threatened by their proximity to campgrounds (Horse Flats, Bandido, Chilao Flats, Messenger Flats, and Lightning Ridge). Designated trails (e.g., the Pacific Crest Trail) are present in the vicinity of occurrences. Fuel wood gathering and communication site maintenance at Mount Gleason are potential threats, and off-highway vehicle activity is a potential threat at Mount Gleason and Messenger Flat (Mistretta and Brown 1987). Any of these occurrence areas could be at risk of impacts from vegetation and fuels treatments in the WUI.

The Angeles National Forest has developed a species management guide for *Castilleja gleasonii* that includes management direction for the conservation of plants and habitat (Mistretta and Brown 1987).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Castilleja gleasonii*:

- Follow the management direction provided in the Species Management Guide for *Castilleja gleasonii*.
- Collect a herbarium voucher specimen of *Castilleja gleasonii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Castilleja gleasonii* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

While selected populations have been identified for protection from land use management activities and there is an action plan in place for the protection and monitoring of plants and habitat it is likely that most occurrences of *Castilleja gleasonii*, no occurrences are fully protected from identified threats.

Based upon the above analysis *Castilleja gleasonii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	A	B	A

Castilleja gleasonii is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Since most threats to this species are directly or indirectly associated with motorized vehicle use, zoning differences between alternatives significantly influences viability outcomes. The occurrences at Chilao and Horse Flats are zoned DAI across all alternatives. The occurrence at Little Rock Creek is zoned backcountry non-motorized in Alternatives 1, 4, and 4a, and is Recommended Wilderness in Alternatives 2, 3, and 6. It is zoned backcountry (motorized) in Alternative 5, and Little Rock Creek is designated as eligible for Wild and Scenic River designation across all alternatives.

The reported group of occurrences on the west end of Liebre Mountain (saddle between Liebre Gulch and Salt Creek) are zoned backcountry across all alternatives, although the area is within the Liebre Mountain SIA in Alternatives 3, 4a, and 6. The Knapp Ranch is zoned backcountry in all alternatives except 4A (where it is zoned backcountry motorized use restricted) and 6 (where it is zoned as recommended wilderness). This occurrence is also in the Liebre Mountain SIA in Alternatives 3, 4a, and 6.

The occurrences at Lightning Point, Messenger Flats, Mount Gleason, and North Fork Pacoima Creek are zoned backcountry (motorized) in Alternatives 1, 2, 4, and 5. These occurrences are zoned a mixture of backcountry and backcountry non-motorized in Alternative 3, and North Fork Pacoima is zoned as a backcountry and backcountry non-motorized mix in Alternatives 4 and 6 also. The Lightning-

Messenger-Gleason core group of occurrences are zoned backcountry motorized use restricted in Alternative 4a, providing a meaningful level of protection from OHV impacts. In Alternative 6, this group of occurrences would be zoned backcountry non-motorized and designated as a Special Interest Area, thereby providing the highest level of protection of all the alternatives.

Consideration of the Standard restricting vehicle travel to designated Forest Transportation System roads and trails, along with the Standards for roads and trails, factor into these outcomes.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	A	B	A

All known occurrences of this species are on the Angeles National Forest, therefore viability of this species across its range is entirely tied to Forest Service management. By maintaining the current distribution of *Castilleja gleasonii* on National Forest System lands, no alternatives would be expected to contribute substantial adverse cumulative effects that would cause *Castilleja gleasonii* to suffer a decline in its overall distribution.

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Castilleja cinerea

Castilleja lasiorhyncha

Castilleja lasiorhyncha

Castilleja lasiorhyncha (A. Gray) Chuang & Heckard (San Bernardino Mountains owl's clover)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Castilleja lasiorhyncha occurs in San Bernardino, Riverside, and San Diego counties. The majority of the known occurrences are found in the San Bernardino Mountains, near Lake Arrowhead, Kinley Creek, Miller Canyon, Rock Camp, Maloney Canyon, Big Bear Lake, Fawnskin, Sugarloaf, Holcomb Valley, Running Springs, Snow Valley, and Hanna Flat. The single occurrence in Riverside County is within Mount San Jacinto State Park, and the record from San Diego County occurs in Cuyamaca Rancho State Park (California Natural Diversity Database 2004).

Distribution in the Planning Area

Occurrences of *Castilleja lasiorhyncha* within the planning area are restricted to the San Bernardino Mountains, the San Bernardino National Forest (SBNF) and the Cuyamaca Mountains within Cuyamaca State Park. Plant distribution in the San Bernardino Mountains ranges from Lake Arrowhead in the west, Running Springs in the south, the town of Woodlands/Erwin Lake in the east, and Union Flat in the north (California Natural Diversity Database 2004). Occurrences with Cuyamaca State Park are adjacent to the Cleveland National Forest. Despite multiple surveys in suitable habitat on the Cleveland National Forest, this taxon has not been observed to date. This taxon is also known from the San Jacinto Mountains at San Jacinto State Park Riverside County (CNDDDB #17), however it is reported extirpated on the Butterfly Peak and Idyllwild quads (California Native Plant Society 2001).

Taxonomy and Natural History

Castilleja lasiorhyncha is an annual dicotyledonous herb in the broomrape family (Orobanchaceae). The

plant is generally 10-20 (40) cm long, glandular-puberulent and spreading-hairy. Leaves are 10-30 mm, linear-lanceolate, with lobes 0-3. The inflorescence is 2-15 cm long, 2-3 cm wide, more or less open, with 8-20 mm-long bracts and 3-5 lobes that are linear-lanceolate and green. The calyx is 8-12 mm, divided 1/3 in front and on the sides and 1/2 in the back. The corolla is yellow and 14-22 mm long, with a straight, densely white-hairy beak that is more or less 7 mm long. The lower lip of the beak is more or less 5 mm long and the pouches are 4-8 mm wide, 3-4 mm deep, with teeth that are more or less 2 mm long. The stigma is included. Fruits are 6-9 mm, and the seed is more or less 1 mm, with a deeply-netted coat that is loose-fitting (Chuang & Heckard 1993). *Castilleja lasiorhyncha* is hemi-parasitic, although its host is unknown. Flowering occurs from June to July (Munz 1974).

Habitat Description

Castilleja lasiorhyncha occurs along vernal moist streams, drainages, springs, and swales and on meadow margins in chaparral and montane conifer forests. The taxon typically occurs in open areas in mesic to drying fine-grained soils of clay or granitic origin. *Castilleja lasiorhyncha* is found between 1,135-2,390 m (California Natural Diversity Database 2004). Plant abundance is strongly correlated with annual rainfall, and known occurrences may be less vigorous or absent in a below-average rainfall year. Suitable habitat for *Castilleja lasiorhyncha* on the SBNF is highly localized to ephemeral wet areas, creating a patchy, sparse distribution. However, the range of suitable habitat may fluctuate with precipitation. Suitable habitat on the SBNF is threatened by hydrological alteration, erosion, and flooding from ground-disturbing activities (especially in winter and spring when soils are wet), cattle grazing, fire suppression activities, fuels and vegetation management, road maintenance, non-native species invasion, development projects, vehicle use off designated roads, and other forest uses.

Castilleja lasiorhyncha may be associated with several plant communities, many of which contain special-status species. The taxon may occur in or on the margins of pebble plain habitat, which supports three Federally Threatened species, eight Forest Service Sensitive, and seven Watch List plant species. In vernal wetlands, *Castilleja lasiorhyncha* may also co-occur with several Forest Service Sensitive and Watch List species, including *Mimulus exiguus*, *Mimulus purpureus*, *Navarretia penninsularis*, *Phacelia exilis*, and *Phacelia mohavensis*. Where *Castilleja lasiorhyncha* occurs on the margins of meadows, it may be associated with any of the four federally Endangered, 15 Forest Service Sensitive and 28 Watch List plant species that occur in meadows on the SBNF. *Castilleja lasiorhyncha* may also be associated with riparian woodlands, Jeffrey/ponderosa pine forest, and the transitional zone from desert mixed chaparral to mixed conifer forest (California Natural Diversity Database 2004; USDA Forest Service 2002).

Occurrence Status

There are 39 occurrences of *Castilleja lasiorhyncha* recorded in California Natural Diversity Database (2004), and many additional occurrences are known on the SBNF. The taxon appears to be stable on SBNF land, although a negative trend is evident in occurrences that are in close proximity to communities around Big Bear Lake and in occurrences that are in high-use recreation areas, near roads,

or near areas grazed by cattle on the Forest. Several occurrences were discovered in 2000 and 2001 around the Lake Arrowhead area (USDA Forest Service 2002), broadening the known distribution of this species. Given that suitable habitat for *Castilleja lasiorhyncha* is highly vulnerable during wet months, it is imperative that these areas are protected during spring and early summer to maintain viable populations on Forest System lands.

Castilleja lasiorhyncha is close to being extirpated in San Diego and Riverside Counties (Reiser 1994). In the San Bernardino Mountains, meadow and vernal wetland habitat on non-Forest land has been rapidly lost in recent years to residential and commercial development. The decline in the overall distribution of *Castilleja lasiorhyncha* emphasizes the importance of preservation of occurrences on Forest System lands.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Castilleja lasiorhyncha* (San Bernardino Mountains owl's-clover)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1980	East face of North Peak, 1 mi. east of summit and 0.5 mi west of junction of Sunrise Hwy and Hwy 79, above Lake Cuyamaca. Incl. occ.#16. PVT-Cuyamaca Rancho State Park	SD
3	1,000 in 1981; > 50 in 1988	1981, 1988	Edges of spring draining from water tanks, 0.5 mi S of town of Sugarloaf. San Bernardino Mountains. SBNF	SBD
4	U	1930	Saragosa Spring, Upper Holcomb Valley, San Bernardino Mountains. SBNF	SBD

5	U	1984	Approx. 0.9 mi. south of Hitchcock Ranch; also 0.5 miles south of Ranch. PVT/SBNF	SBD
7	U	1907	Fawnskin Park, San Bernardino Mts. PVT	SBD
8	U	1969	San Bernardino Mts. Along Hwy 38, 0.3 mi E of JCT w/ Hwy 18, near E end of Big Bear Lk. PVT	SBD
9	U	1926	Bear Valley, flats near Bear Tavern. Historic record. PVT	SBD
10	U/abundant	1989	Between Arrastre Flat and Union Flat, San Bernardino Mts. SBNF	SBD
11	U	1980	South of Baldwin Lake, about 0.5 mile east of Big Bear Blvd. And 0.3 mile south of Shay Road, south of Jeep Road. SBNF	SBD
14	U/largely extirpated	1982	Metcalf Bay, Bear Valley. Meadow at margin of bay in S shore. Located on either side of main road entrance to Presbyterian Conference Grounds. PVT	SBD
17	U	1980 (CNPS map)	San Jacinto Mountains, between Tahquitz and Little Tahquitz Valleys. /DPR-Mount San Jacinto State Park.	RIV

18	> 5,000	1978	North of Hwy 18 across from Snow Valley Ski Area. Just north and west of summer homes, San Bernardino Mountains. SBNF // Snow valley, north of Keller Peak (Roos/UCR)	SBD
24499 (UCR)		1956		
19	U	1916, 1974	Little Bear Valley (= vic Lake Arrowhead). Little Bear Lake is now under Lake Arrowhead – 1974. U	SBD
20	U	1978	Ash Meadows, Lk Arrowhead. SBNF	SBD
21	U	1935	Squints Ranch, 4 mi N Lake Arrowhead, Deep Creek drainage, San Bernardino Mts. SBNF // (Wheeler/UCR) // Squint's Ranch "alt. 1500 m" [3 miles north of Lake Arrowhead] (Clokey/UCR)	SBD
131610 (UCR)				
133629 (UCR)				
22	U	1967	Meadow at Toll Road public camp below Lake Arrowhead. SBNF	SBD
24	U	1980	Big Bear City; just N of Hwy 18 & just E of Pioneer Ln. PVT	SBD
25	U	1989	Between Deer Lick Ranger Station and Running Springs School, east side of town of Running Springs, San Bernardino Mountains. PVT	SBD

26	U	1982 (map)	On ridge just north of Northshore Campground, east end of Lake Arrowhead. SBNF	SBD
27	U	1982 (map)	Fawnskin Valley. PVT	SBD
29	U	1982 (map)	0.3 mi NW of town of Woodlands. PVT	SBD
30	U	1979, 1984, 1982 (map)	0.5 mile east of Bluff Lake, San Bernardino Mountains. SBNF	SBD
31	U	1974	San Bernardino Mts near Lk Arrowhead, Maloney Cyn at end of USFS Rd 3N20. SBNF	SBD
32	U	1980	Harry Spring, Hanna Flat, San Bernardino Mts. SBNF	SBD
34	U	1929	Hill slope N of Golf Course, Lake Arrowhead, San Bernardino Mtns. PVT	SBD
35	U	1890	Strawberry Valley (= Strawberry Flat near Lake Arrowhead?) PVT	SBD
36	U	1984 (map)	Near Eagle Point, S shore of Big Bear Lake. PVT-Big Bear Properties	SBD
37	U	1984 (map)	Castle Glen area, Big Bear Lake, San Bernardino Mtns. PVT	SBD

38	U	1984 (map); 1988	Upper Holcomb Valley, San Bernardino Mtns. SBNF	SBD
39	U	1987	Old Ski Beach at Kidd Cove, southwest end of Big Bear Lake, San Bernardino Mountains. Plants at lake shore in midst of Forest Service special use cabins. SBNF	SBD
40	2 in 1993; 9 in 2000; 11 in 2001	1993, 2000, 2001	Along Kinley Creek, just east of Highway 173 and north of junction with USFS Road to 3N39. SBNF	SBD
41	200+	1992	North side of Willow Creek Jeep trail, just north of dirt road to major ORV staging area. About 0.2 mile east of Highway 173. San Bernardino Mtns. SBNF	SBD
42 72286 (UCR)	25 in 1992; 50 in 2000	1992, 2000	Just east of Rock Camp Guard Station along Highway 173, northwest of Lake Arrowhead, San Bernardino Mountains. SBNF // San Bernardino National Forest, vicinity of Rock Camp Ranger Station- from the station to 1 mi due E, S of Hwy 173 (White/UCR)	SBD

43	25 in 1987; 15 in 1991	1987, 1991	Along Pilot Rock Road about 0.3 mile west of Highway 173, northwest of Lake Arrowhead. Just off road at Lake Arrowhead sewage treatment plant. San Bernardino Mountains. SBNF	SBD
44	50 in 1987; 100-200 in 1989	1987, 1989	Adjacent to Pilot Rock Road (Forest Road 2N33) and just east of junction with 2N34, about 0.6 mile southeast of Mount Marie Louise, northwest of Lake Arrowhead, San Bernardino Mountains. SBNF	SBD
45	20 in 1989; 35 in 1991	1989, 1991	East Miller Canyon, about 2.2 miles east of Silverwood Lake. Mapped just east of the junction of Miller Canyon Trail and Valley of the Moon Road, between the two roads. San Bernardino Mtns. SBNF	SBD
*	30	1999	On west side of road leading to the 2N10 trailhead and Snow Valley Recreation Residence about 10 yards S of a propane tank. SBNF	SBD
*	200 in 2000; 26 in 2001	2000, 2001	Along banks of drainage on the E and W sides of Hwy 173 at junction of Hwy 173 and Forest Road 3N34. SBNF	SBD

*	> 200	2000	Dry meadow on lakeside of Big Bear Lake on private road N of HWY 18, approx. 1 mi. E of dam. SBNF	SBD
*	7	2000	In small drainage on S side of 3N34, 0.2 mi SE of blocked off 4WD road going to Maloney Canyon. SBNF	SBD
*	25	2000	In small drainage on S side of 3N34 0.4 mi SE of blocked off 4WD road going to Maloney Canyon. SBNF	SBD
46	50	2001	ORV trail 1W17, halfway between trailhead and Pacific Crest Trail. SBNF	SBD
*	1	2001	ORV trail 1W17 with streambed crossing, northwest side of trail. SBNF	SBD
47	805	2001	Plants in unnamed stream corridor and all of its headwater branches 0.3 miles from road junction with 3N34 on NW side of road 3N16. San Bernardino Mtns. SBNF	SBD
*	30	2001	Pinnacles ORV staging area. Meadow south of Willow Rd (3N34) and east of staging area. SBNF	SBD
*48	1	2001	Rouse Meadow, east of road 3N34. SBNF	SBD

*	U	1926, 1936	Edge of Bluff Lake Meadow (UC/Jeps). The Wildlands Conservancy.	SBD
*	U	1979	West edge of Arrastre Flat SBNF	SBD
*	U	1979 2001	Holcomb Valley Campground shallow pond and grassy openings on placer workings (UC/Jeps) (Kopp) trail rerouted and area signed in 2001, still affected by some dispersed use as is adjacent to campground SBNF	SBD
*	U	1969	Along Hwy 38, 0.3 mi E of junction with Hwy 18 in meadowy roadside (puts it at N shore Baldwin Lk, may be on SBNF) (UC/Jeps)	SBD
*	U	2000	Big Bear Lake, S shore of lake at Metcalf Bay, between Prairie Lane and Metcalf View Drive (UC/Jeps)	SBD
*	U	1994 1999	S shore Big Bear Lake, W side of Fisher Cove by FS Southwest Shore recreational cabin #8, E of Old Ski Beach occurrence. Fencing recommended in 1994 report has not been installed, however cabin owners know of location and protect as much as possible.(White/Tierra Madre Consultants, Inc.) (Volgarino/Butler/USFS)	SBD

			SBNF	
* 24499 (UCR)	U	1956 1965	Snow Valley, N of Keller Peak. (Roos/UCR) . SBNF // Snow valley, north of Keller Peak(Roos/UCR)	SBD
	U	1982	Running Springs T1N, R2W, S4. (Krantz/UCR) could be Deer Lick Station occurrences but most of land in section 4 is private so unknown	SBD
24495 (UCR)	U	1940	Green Valley (Roos/UCR)	SBD
27044 (UCR)	U	1980	Big Bear Valley, on site of old fox Farm, N side of Hwy 18 T2N, R1E, S11 E1/2 with MIPU (Krantz/UCR)	SBD
20117 (UCR)	U	1978	Lake Arrowhead, 0.2 mi N on 3N20 in meadow on right side of rd. T2N, R3W, S11 (Krantz/UCR)	SBD
15908 (UCR)	U	1979	Along Forest Rd 3N16 ca 3 mi W of county dump, where rd 3N02 to Burnt flat turns to NW (Clark/UCR) SBNF	SBD
20074 (UCR)	U	1979	Big Bear Lake. Eagle Point, small pocket near shore at confluence of annual stream and lake (Krantz/UCR)	SBD

75000 (UCR)	U	1992	E of Running Springs T1N, R2W, S 4 NE1/4 (Hirshberg/UCR) Unable to tell if this is FS Deer Lick Station, Camp Conifer or pvt land	SBD
83760 (UCR)	U	1994	Upper Miller Canyon (E fork of Mojave Rv), above confluence with Houston Cr. along FS rd 2N37. T2N, R4W, S11&12, S1/2 (Sanders/McKay/UCR) SBNF	SBD
*	U	2000	Approx. 1 mi N of Keller Peak, N of Shady Cove Group Camp T2N, R2W, SW1/4 S36 and T2N, R2W, SE1/4 S35. Occurrences mapped for proposed Trials Event NEPA. No major threats to occurrences or habitat. (Stamer/Volgarino) SBNF	SBD
*	U	2001	Snow Valley Recreation Area. T2N, R1W, SE1/4 S 25. same as CNDDDB 35. Use has been modified to reduce effects from snow and bike use under special use permit In association with CACI. Green Valley Trail delineated but plants may still be affected there to some degree. Trailhead and recreational cabins adjacent. (Kopp) SBNF	SBD

*	U	2003	Large occurrence is mapped on Forest GIS, west of Snow Valley T2N, R2W, near junction of S26,25,35,36. (Kopp) SBNF	SBD
*	U	2003	USFS Deer Lick Fire Station, Children's Forest Office, TT1N, R2W, S4. Fire personnel are aware of occurrence by stream by engine bay. Occurrence by Children's Forest office door has been fenced to exclude trampling. (Kopp) SBNF	SBD
* (RSA)	147	2004	Ash Meadows on the SE side of Ash Meadows road (2N75). T2N, R3W, S11. Near road and homes. Area burned in 2003 Old Fire. (Fraga/RSA) SBNF	SBD
*	41	2004	Rouse meadow, along FS road 2N25Y. Area burned in 2003 Old Fire. (Hawke) SBNF	SBD
*	300	2004	Maloney Canyon and Stove Flats area, in between and adjacent to FS roads 2N26 and 3N34. Area burned in 2003 Old Fire. (Hawke) SBNF	SBD

*	100	2004	Tributary of Grout Creek, north of Gray's Peak. T2N, R1W, S10. Area burned in 2003 Old Fire. (Wagner) SBNF	SBD
20120 (UCR)	U	1978	Holcomb Valley, in drainage of Saragosa Spring, crossing 3N16 ca. 0.2 miles west of junction with 3N02, T3N/R1E/S35 (Krantz/UCR)	SBD
54627 (UCR)	U	1982	Running Springs. Laband parcel next to elementary school near Hwy 18, T1N. R2W/S4, elev. 6000 ft. (Krantz/UCR)	SBD
17500 (UCR)	U	1979	Arrastre Flat, NW of Baldwin Mine (Vasek/UCR)	SBD
*	210	2004	W of 2929Y, N of 2N75, Sewage Disposal Ponds, section 2 of Lake Arrowhead Quad (Hawke, R. T.)	SBD
*	80	2004	Lake Arrowhead Quad, Section 35, W of 3N38, N of	

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *SD = San Diego County*

Threats

On NFS lands, occurrences are located on administrative sites, developed recreation sites; there are multiple locations managed under special use permits. Occurrences are found along forest system roads and trails. Primary threats to *Castilleja lasiorhyncha* on Forest System lands are hydrological impacts resulting from ground-disturbing activities (especially during winter and spring when soils are wet), water diversions, cattle grazing, roads and road maintenance, non-native species invasion, dispersed and developed recreation, and activities under special use permit. Fire suppression and rehabilitation projects affect habitat as does unauthorized motorized and mechanized vehicle use off designated roads and trails. The main threat to *Castilleja lasiorhyncha* occurrences off Forest System lands is extirpation and habitat loss from residential development.

Conservation and Management Considerations

The short-term conservation strategy for *Castilleja lasiorhyncha* is to develop a Habitat Management Guide and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Prepare a Habitat Management Guide for vernal wetlands on the SBNF, including mesic swales, seeps and springs. This Guide should specifically address *Castilleja lasiorhyncha* and associated mesic species including *Calochortus parmeri* var. *parmeri*, *Mimulus exiguus*, *Phacelia mojavensis*, *Phacelia exilis*, and *Navarretia penninsularis* where they occur on the SBNF.
- Implement the CNF and SBNF Meadow Habitat Management Guides to greatest extent practicable.
- Identify, describe, and map suitable habitat for *Castilleja lasiorhyncha* on the SBNF and survey these areas during a normal or above-normal rainfall year for species occurrence.
- Survey all new occurrences of *Castilleja lasiorhyncha* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Castilleja lasiorhyncha* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Castilleja lasiorhyncha* in the area using NRIS data collection standards, and incorporate these occurrences into the corporate GIS database.

Evaluation of Current Situation and Threats on National Forest System Lands

Castilleja lasiorhyncha is a rare, narrowly-distributed species, known mainly from the San Bernardino Mountains, with small disjunct occurrences in the San Jacinto and Cuyamaca Mountains. On the San Bernardino National Forest, conservation actions completed to protect listed species have benefited habitat; however few occurrences are fully protected from identified threats.

Based on the above analysis, *Castilleja lasiorhyncha* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to

persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	C	A

Castilleja lasiorhyncha is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Consideration of the Suitable Use restricting motorized and mechanized vehicle travel to Forest System roads and trails, along with Standards regarding rare species management, riparian areas, recreation use, SIA management, and grazing management factor into the predicted outcomes.

The majority of ongoing and expected impacts to this species occur in Back Country and Developed Area Interface zones. Multiple occurrences will retain protection within the existing North Baldwin Lake/Holcomb Valley Special Interest Area under all alternatives. In Alternatives 2-6, Standard S33 would provide a higher level of protection within this SIA as new projects are proposed.

Under Alternatives 1, and 4, this species would be at continued risk from ongoing impacts to its habitat at approximately current levels. The Union Flat Critical Biological zone in Alternative 3, and the Arrastre Research Natural Area in Alternatives 2, 3, 4a and 6 would add additional protection for a small portion of the species range. The recommended Children’s Forest Special Interest Area would add needed protection to occurrences on west side of the SBNF range in Alternatives 2, 3, 4, 4a, and 6. Under Alternative 5 there would be increased threats as a result in an increase in Back Country zoning across the range of the species, an expected increase in road and trail construction and use, and potential for additional water diversions/extractions. No occurrences would benefit from recommended special area designations under Alternative 5. Under Alternatives 3, 4a, and 6, an increase of Back Country Non-Motorized zoning and use of Back Country Motorized Use Restricted in Alternative 4a would also provide a higher degree of habitat protection. Preparation of a Habitat Management Guide to address this species would be expected to have a higher priority and happen sooner under Alternatives 2, 3, 4, 4a and 6. The response time and effectiveness of impact identification and management would be expected to be higher under Alternatives 3 and 6.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

The private lands of Big Bear Valley and the Lake Arrowhead area have been highly reduced and fragmented by residential and commercial development. The remaining fragments continue to be lost as continued development occurs. As development increases, the demand for water and new diversions/ extractions also increases. The majority of the distribution of this taxon occurs on National Forest System lands on the SBNF. While it is presumed that this species continues to lose habitat to private land development, this loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF. By maintaining the current distribution of *Castilleja lasiorhyncha* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Castilleja lasiorhyncha* to suffer a decline in its overall distribution.

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Castilleja gleasonii

Castilleja montigena

Castilleja montigena

Castilleja montigena Heckard (Heckard's paintbrush)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Castilleja montigena is endemic to the eastern San Bernardino Mountains in San Bernardino County (California Native Plant Society 2001, Chuang and Heckard 1993).

Distribution in the Planning Area

Castilleja montigena occurs on the San Bernardino National Forest. Heckard and others (1980) described the distribution in relation to *Castilleja chromosa* (now *C. angustifolia*) and *C. martinii* var. *martini* (now *C. applegatei* var. *martini*) of which *Castilleja montigena* derived. The new plant names are inserted here by the species reviewer (Kopp) to aid in describing the situation as of 2003. "*Castilleja angustifolia* occupies sagebrush and juniper/pinyon communities of the rocky Mountains, Great Basin, and Mojave Desert, reaching elevations of 2200 m in northern and eastern parts of the San Bernardino Mts. *Castilleja applegatei* var. *martinii*, of open oak woodland and mixed evergreen and yellow pine forests, ranges southward in the Coast Ranges of California from Sidkiyou Co. to the Sierra San Pedro Martir of Baja California. It is found in the southwestern San Bernardino Mountains up to 2100 m, separated by about 20 km from known populations of *C. angustifolia* at the eastern end of the mountains. *Castilleja montigena* occupies the intervening area at 1950 m to 2800 m, largely in open pine-oak (*Pinus jeffreyi*, *P. ponderosa*, *Quercus chrysolepis*, *Q. kelloggii*) forests, but sharing transition habitat with the other two *Castilleja* species at the margins of their ranges. For the most part *Castilleja montigena* occupies its own distinctive habitat, in fact one with vegetation that is unusual for southern California. The northeastern portion of the mountains near Big Bear Lake has cold climate with high elevations but because of the position leeward of high mountains receives less precipitation (less than 50 cm/year). Populations of *C. montigena* intermingle with those of *C. angustifolia* near Baldwin Lake and

overlap those of *C. applegatei* var. *martinii* west of Big Bear Lake. No conspicuous morphological intergradation between species was evident in these overlapping populations.

The type locality (Heckard and others 1980) is the San Bernardino Mountains, just N of the western arm of Baldwin Lake, 2074 meters, associated with *Castilleja chromosa*, *Artemesia tridentata*, *Ephedra viridis*, in pinyon juniper woodland 12 June 1976. Heckard and Morris 42-40 (Holotype:JEPS isotypes NY, RSA,WTU).

Taxonomy and Natural History

Castilleja montigena is a dicotyledon in the broomrape family (Orobanchaceae) (APG11 2003).

Castilleja montigena is a hemiparasitic perennial herb that blooms May–August (California Native Plant Society 2001).

This species is presumed to be a stabilized polyploid species of hybrid origin, with *Castilleja applegatei* ssp. *martinii* and *C. angustifolia* as the parental species (Heckard and others 1980). In their studies (Heckard and others 1980) wrote "Whether *C. montigena* should be given specific or infraspecific status is problematical, as in other polyploid groups where morphological differences among different ploidy levels are slight and recombinant. We do not feel that its polyploid condition justifies specific status in itself because we have not accorded formal status to polyploid populations that occur in both *C. chromosa* and *C. martini* var. *martini*. It remains possible, of course, that further taxonomic recognition will be accorded within these polyploid groups when they are more thoroughly studied. Our decision to acknowledge *C. montigena* as a species is pragmatic and is based on observations that its populations occupy their own habitat and geographical range for the most part, yet cohabit with both of the putative diploid progenitors and remain recognizably distinct from both. All of the specimens cited by Holmgren as *C. martinii* var. *ewanii* are identified by us (Heckard and others 1980), as *C. montigena*".

For the description of *Castilleja montigena* see Heckard and others (1980).

Habitat Description

See information above in section titled "Distribution in the Planning Area".

Occurrence Status

Castilleja montigena appears to be locally common where it occurs; however, little is known about its population status or trends on National Forest System lands (USDA Forest Service 2002). The California Natural Diversity Database (2004) does not track *Castilleja montigena*.

Castilleja montigena is described in the Jepson Manual under *Castilleja applegatei* ssp. *martinii* (Chuang and Heckard 1993). Locations are described in the Draft San Bernardino Mountains Flora under *Castilleja angustifolia* (Krantz, et. al. draft 2000). Because taxonomy on this species has not been

affirmed, and because locations in the SBNF species file, in the Manual and the Draft San Bernardino Mountains Flora are a combination of *Castilleja martinii* var. *ewanii*, *C. angustifolia* and *Castilleja applegatei* ssp. *martinii*, they will not be listed in this document until clarification is completed.

The Initial Editorial Analysis for *Castilleja montigena* dated November 1, 2001 states that this species is a hybrid between *Castilleja applegatei* subsp. *Martinii* and *C. angustifolia*. A new name or combination possibly needed. Current Status =unresolved (Jepson Interchange 2003).

Several occurrences present within limestone mining claims on the north slope of the San Bernardino Mountains will be lost to future mining operations approved under special use permit by the San Bernardino National Forest (USDA Forest Service 2001). Because *Castilleja montigena* is a hemiparasite, disturbance to the habitat to a degree that would prevent reestablishment of the host species (*Artemisia tridentata* or *Chrysothamnus nauseosus*) would also impact *Castilleja montigena*. Recreational use may affect individuals and habitat for this species, however level of threat is unknown at this time.

The following is a prioritized list of conservation practices that should be considered for *Castilleja montigena*:

- Elevate protection of this species as necessary as taxonomy is defined.
- Learn to recognize this species and to differentiate between the parent species. Record habitat parameters and effects to habitat. Survey locations in the project file to determine taxonomy of occurrences and protect as necessary.
- Collect a herbarium voucher specimen of *Castilleja montigena* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Castilleja montigena* in the planning area using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.
- Implement the Carbonate Habitat Management Strategy

Evaluation of Current Situation and Threats on National Forest System Lands

Castilleja montigena is endemic to the eastern San Bernardino Mountains in San Bernardino County (California Native Plant Society 2001, Chuang and Heckard 1993). Recreational activities may affect individuals and habitat but effects are not known at this time. Some of the suitable habitat on the north slope of the San Bernardino Mountains is remote and inaccessible to vehicle impacts. Mining impacts will be addressed at the project level, and will be guided by provisions of the Carbonate Habitat Management Strategy. *Castilleja montigena* is a SBNF Watch List species. The Initial Editorial Analysis for *Castilleja montigena* dated November 1, 2001 states that this species is a hybrid between *Castilleja applegatei* subsp. *Martinii* and *C. angustifolia*. A new name or combination possibly needed. Current Status =unresolved (Jepson Interchange 2003). As the status of this species is revised, SBNF botanists will need to analyze whether a higher level of analysis is needed for this species and/or whether

protection is warranted on the San Bernardino National Forest.

Based on the above analysis *Castilleja montigena* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Castilleja montigena is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Castilleja montigena* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives *Castilleja montigena* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Castilleja montigena* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Castilleja lasiorhyncha

Castilleja plagiotoma

Castilleja plagiotoma

Castilleja plagiotoma A. Gray (Mojave paintbrush)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Castilleja plagiotoma occurs from Kern to San Bernardino counties in the southern Sierra Nevada, the southern San Joaquin Valley, the interior South Coast Ranges, the Transverse Ranges, and the Mojave Desert (California Native Plant Society 2001, Chuang and Heckard 1993). BLM lands adjacent to the San Bernardino National Forest, particularly the Ord Mountains and Juniper Flats areas, contain important habitat for this species. However, recent surveys of the Ord Mountains has found that many occurrences have disappeared since the Willow Fire of 1999 (Pratt pers. comm.).

Distribution in the Planning Area

Castilleja plagiotoma is known to occur on the San Bernardino and Angeles National Forests. Known occurrences on the San Bernardino National Forest are all northwest of Big Bear Lake and include the ridge above Coxey Meadow, Little Pine Flats, Coyote Flats, Summit Valley, and Round Mountain (Krantz and others 2000). There is a significant amount of habitat near to the east of the LPNF (Cuyama Valley, Elkhorn Hills, etc), but no known occurrences on the LPNF (USDA Forest Service 2002b).

Taxonomy and Natural History

Castilleja plagiotoma is a dicotelydon in the broomrape family (Orobanchaceae) (APGII 2003). When dry, the yellow-green inflorescence of this species resembles the Threatened ashy-gray paintbrush (*C. cinerea*) (USDA Forest Service 2002a).

Castilleja plagiotoma is a hemiparasitic perennial herb that blooms April–June (California Native Plant Society 2001). It is the larval host plant for the rare Ehrlich's checkerspot butterfly (*Euphydryas editha ehrlichi*) (Emmel and Emmel 1973).

Castilleja plagiotoma is a 30-60 cm perennial that is gray-green, becoming more or less maroon, and puberulent with branched hairs (especially on the leaves). The leaves are 20-50 mm, more or less linear, and have 3-5 lobes. The inflorescence is 3-20 cm. The inflorescence bracts are 13-20 mm with 3-5 white woolly lobes. The central lobe is wide, truncate, and green. The calyx is 12-18 mm, pale yellow, white-woolly, divided 1/8 in the back, 1/4 in the front, and more or less 1/2 on the sides. The front lobes are more or less 2 mm greater than the back lobes. The corolla is 12-20 mm. The beak is more or less equal to the tube, included, yellowish, puberulent on the back, with pale margins, and the lower lip 1 mm and pale green. The stigma is barely exerted and head-like. The fruit are more or less 10 mm. The seeds are 1-1.5 mm. The coat is deeply netted, tight-fitting, and most walls are ladder-like (Chuang and Heckard 1993).

Habitat Description

Castilleja plagiotoma grows primarily on *Artemisia tridentata* in alluvial soils in sagebrush scrub, Joshua tree woodlands, pinyon woodlands, and lower montane coniferous forest at elevations of 975–8,125 feet (300–2,500 meters) (California Native Plant Society 2001). *Castilleja plagiotoma* is also known to use *Eriogonum fasciculatum* var. *polifolium*, *Chrysothamnus nauseosus* (Mistretta 1994), *Ericameria linearifolia* (Sanders 1995) and *Salvia dorrii* (Swinney 1995) as host plants. In the San Bernardino Mountains, *Castilleja plagiotoma* occurs on pebble plain habitat at Little Pine Flats where it occurs in association with *Arabis parishii*, *Dudleya abramsii* ssp. *affinis*, and *Eriogonum kennedyi* var. *kennedyi*. The species also occurs on dry flats, desert slopes, and along the northern base of the San Gabriel Mountains (Chuang and Heckard 1993).

These habitats are well distributed within the plan area; however, there may be specific microhabitat requirements that are much more narrowly distributed. Sagebrush scrub, Joshua tree woodland, pinyon-juniper woodland, and lower montane coniferous forest are threatened by altered fire regimes and various recreational activities, including vehicle use off of designated roads. Where *Castilleja plagiotoma* occurs in association with pebble plain habitat, it may benefit from conservation measures in the Pebble Plain Habitat Management Guide.

Occurrence Status

CalFlora lists several occurrences of *Castilleja plagiotoma*; however, many are records from historical herbarium specimens and need current fieldwork. Most records lack information that is site-specific enough to determine land ownership.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Castilleja plagiotoma* (Mojave paintbrush)

Occurrence No.	No. of Plants	Year Reported	Location/Land Owner	County
1196408, 1435064	U	1914, 1905	Near Cajon Pass. Land owner: U.	SBD
1251664, 1373145	U	1941, 1926	Hesperia. Land owner: U.	SBD
1323953	U	1902	Head of Lytle Creek Canyon. SBNF?	SBD
1365537, 1189724	U	1919, 1960	Near summit of Cajon Pass. Land owner: U.	SBD
1323065 /190638 (RSA)	U	1967	W of mouth of Deep Creek; N base of San Bernardino Mtns. Land owner: U	SBD
1332453	U	1979	Bowen Ranch, ca. 1 mi. ENE. N side of San Bernardino Mtns. Land owner: Priv.	SBD
1196448, 1358680	U	1886	Mojave Desert, N side Cox's Ranch. [Little Pine Flats] SBNF	SBD
1337828	U	1947	10 mi. NW of Cajon Pass, W edge of Mojave Desert. Land owner: U.	SBD
1368637	U	1895	Mojave Desert. Land owner: U.	SBD
1129228	U	1960	4 mi. N of Cajon Pass. Land owner: U.	SBD

1199348	U	1963	12 mi. SW of Lucerne Valley. Near radar tower along Grapevine Canyon. N side of San Bernardino Mtns. BLM.	SBD
1815915	U	1929	Wrightwood, Twin Lakes. Land owner: private	SBD
*	U	2003	San Bernardino National Forest. Little Pine Flat, ca. 4 miles S of Grapevine Canyon. On pebble plain habitat and adjacent openings with <i>Artemisia tridentata</i> (Kopp/USFS)	SBD
489166 (RSA)	U	1988	Mojave Desert. Hesperia area, ½ mile W of Lake Arrowhead Road, and approx. 1.5 mile NW of Deep Creek dam (Meyers/RSA)	SBD
444745 (RSA)	U	1947	Western edge of Mojave Desert. 10 miles NW of Cajon Pass. San Gabriel Mnts. elevation 4600' (Benson/RSA)	SBD
86970 (UCR)	U	1995	Ord Mountains area. About 1 air mile W. of Bowen's Ranch. (Sanders/RSA) Landowner: BLM	SBD
311433 (RSA)	U	1976	Lower Holcomb Creek, Devil's Punchbowl County Park. (Long/RSA)	LA
50787 (UCR)	U	1988	Los Flores Ranch area ca. w miles N of intersection of Grass Valley Cr. And Hwy 173, ca. 2.5 miles E of the California aqueduct (Hirshberg/UCR)	SBD

25811 (UCR)	U	1949	6 miles SW of Hesperia (Roos/UCR)	SBD
26178 (UCR)	U	1937	Swarthout Valley (Roos/UCR)	SBD
15768 (UCR)	U	1978	Top of Round Mt, SE of Hesperia. Landowner: BLM (Vasek/UCR)	SBD
86760 (UCR)	U	1995	N. side of mtns. S of Apple Valley, FS Road 3N14, (Oak Springs Rd) ca. 2.8 miles above Bowen Ranch Road and ca. 0.5 mile below Oak Spring. T3N, R2W, S5. Landowner: BLM (Sanders/UCR) About 1 mile ENE of Bowen Ranch on Mojave Desert slopes. N side of San Bernadino Mts. Elevation ca. 4400 ft.	SBD
309670 (RSA)		1979		
86963 (UCR)	U	1995	Ord Mts area, old marble mine just S of where powerlines cross rd, ca. 2 miles due W of Bowen's Ranch. Burned 1994 (Sanders/UCR)	SBD
86741 (UCR)	U	1995	Grapevine Canyon Rd. 4.2 miles above Santa Fe Railroad and 0.6 mile above microwave tower, S of Apple Valley. BLM (Sanders/UCR)	SBD
577254 (RSA)	U	1994	San Gabriel Mts. Horse Canyon/ Circle Mtn Rehab project. In wide drainage W of Circle Mountain. Telegraph Peak 7.5' USGS T3N R7W sec. 15. elevation 5800. SBNF Admin by ANF. (Mistretta/RSA)	SBD

665383 (RSA)	U	1995	Between Pinon Hills and Sheep Creek, 0.9 miles South of Hwy 138 on Scrub Oak Rd., 70 meters west of road (Swinney/RSA)	SBD
149895 (UCR)	U	1999	Big John Flat, northern edge T4N/R8W/S20 (Swinney/UCR)	LA
1263263	U	1926	4 mi. S of Vincent. Mint Canyon Road, Soledad Pass. Land owner: U.	LA
588065 (RSA)	U	1994	San Gabriel Mountains, Santiago Canyon. W slopes of drainage near confluence with Little Rock Creek. Pacifico Mt. 7.5' USGS quad: T4N R11W NW1/4 sec. 3. alt. 3400 ft.(Mistretta/RSA). ANF.	LA
124714 (UCR)	U	1933	West Blue Ridge, Big Pines Park, Angeles National Forest (Templeton/UCR)	LA
1318525, 1368638	U	1909, 1895	Lancaster. Land owner: U.	LA
1816981, 1370064	U	1929, 1923	Big Rock Creek, San Gabriel Mtns. Land owner: U.	LA
1196417	U	1919	Arrastre Canyon, San Gabriel Mtns. Land owner: U.	LA
1241743, 1241742	U	1976	ca. 3 mi. W of Wrightwood, along Route 2, 0.5 mi. E of Big Pines Ranger Station, 0.5 mi. W of Holiday Hills Ski Lifts. San Gabriel Mtns. Land owner: U.	LA

1816982	U	1925	Mojave Desert: Antelope Valley. Land owner: U.	LA
1815712	U	1983	Bob's Gap, 0.25 mi. E of Limekiln ruins, 2.7 mi. S of Pearblossom Hwy . Land owner: U.	LA
1179367	U	1948	Above Little Rock; desert foothills of the San Gabriel Mtns. Land owner: U.	LA
1226319// 292673 (RSA)	U	1970// 1973	Above Pearblossum; State Road N6 to Devil's Punch Bowl. Land owner: U. //6 (air) miles SE of Pearblossom, 4.6 (rd) miles S of LLano in lower portion of Bob's Gap along 165 st. alt. 4050 ft. (Henrickson/RSA)	LA
596690 (RSA)	U	1996	San Gabriel Mts. Approx 200m N of Hwy 2 at Mountain High Ski Resort (E runway). (T3N, R8W, NE/16 pf SW/4 of sec.1) alt. 2088m/6850ft. (Swinney/ RSA)	LA
1195948	U	1918	N side San Gabriel Mtns. Lower Rock Creek canyon. Land owner: U	LA
1340366 138548 (UCR)	U	1986	Hwy 138 jct w/ Hwy 18 NE of Pinyon Hills 4 mi. E of Mojave Desert. Land owner: U. (Boyd/ UCR)	LA
*	U	1991	Liebre Mts. Region. Parker Mt. And ridge to SW of Acton and NNE of Ravenna. (Ross/ RSA)	LA

605498 (RSA)	U	1968	San Gabriel Mts. Region. Alimony Ridge (Wheeler/RSA)	LA
138503 (UCR)	U	1970	San Gabriel Mts. Blue Ridge (Wheeler/RSA)	LA
*	U	1994	San Gabriel Mts. Little Rock Creek. Drainage E of creek and N. of Forest Road 4N15	LA
*	U	1994	San Gabriel Mts. Little Rock Creek. Unnamed drainage draining N. slope of Bear Mt. (Mistretta/RSA)	LA
588971 (RSA)	U	1995	San Gabriel Mts. Little Rock Creek. Unnamed canyon draining w. slopes of Little Rock Canyon 0.5 mile N of Kitter Canyon. (Mistretta/RSA)	LA
586670 (RSA)	U	1995	Bear Mt. Canyon west fork (Mistretta/RSA)	LA
641299 (RSA) / 71664 (RSA)	U	1995	Lightning Ridge trail, Blue Ridge (Mistretta/ RSA) // Blue Ridge, South of swartout Valley. San Gabriel Mts. alt. 7500 ft.	LA
147780 (UCR)	U	2000	South fork Little Rock Creek, SW Pinyon flats, NE Alder Saddle (Soza/RSA). ANF	LA
601942 (RSA)	U	1946	San Gabriel Mts. Chilao Guard Station (wheeler/RSA)	LA
552396 (RSA)	U	1990	Kentucky Springs, Sierra Highway northern edge of Angeles National Forest	LA

94444 (UCR)	U	1996	San Gabriel Mts. Approx. 200m N of Hwy 2 at Mountain High Ski Resort, E. runway, T3N/R8N/S1 (Swinney/UCR)	LA
628874 (RSA) 119557 (UCR)	U	1968	San Gabriel Mts. Big Rock Creek, ¾ mile N of Big Rock Springs (Wheeler/RSA) // T4N/R9W/S8/ SE ¼	LA
588138 (RSA)	U	1994	San Gabriel Mts. Santiago Canyon. W slopes of drainage near confluence with Little Rock Creek (Mistretta/RSA)	LA
84569 (UCR)	U	1994	San Gabriel Mts. Horse Canyon/ Circle Mt Rehab Project, in wide drainage of Circle Mt. Telegraph Peak (Mistretta/RSA)	LA
119659 (UCR)	U	1995	Between Pinyon Hills and Sheep Creek. 0.9 miles S of Highway 138 on Scrub Oak Rd. 70 meters w. of rd. (Swinney/RSA)	LA
668077 (RSA)	U	2001	Antelope Valley, Bob's Gap, about 0.25 miles SE of junction of Bob's Gap Road and Panorama road (Long/RSA)	LA
659955 (RSA)	U	1992	Angeles National Forest, Hunt Canyon shooting area, Mt. Emma Rd. 2 miles W of Little Rock Dam	LA

570150 (RSA)	U	1991	Parker mountain and ridge to SW: SW of Acton and NNE of Ravenna. T4N R13W; W edge section 2, E and SE edge section 3, NNE edge section 10. Collected between 3670-4131 (summit) feet elevation. (Ross/RSA)	LA
448770 (RSA)	U	1932	Big Pines Park, Angeles National Forest, near Ranger Station (Templeton/UCR)	LA
1265949	U	1937	1 mi. NE of Cuyama Ranch. Land owner: U.	SB
149525 (UCR)	U	1997	West of Wrightwood, ca. 0.25 mi. east of Hwy 2, ca. 300 m N of Guffy Rd., T3N/R8w/S3/ SW ¼ of SE ¼ (Swinney/UCR)	LA
806599	U	1988	N base of hills 2 mi. NE of Wells Ranch. Sparse Bromus rubens annual grassland with scattered shrubs of Atriplex polycarpa, Haplopappus linearifolius, Eastwoodea elegans, growing up only within the shrubs.	SLO
1318929	U	1967	Chalk Mt. Cuyama Valley. Land owner: U.	SLO
1815914	U	1973	Cuyama Valley, at E base of Caliente Mtn. Land owner: U.	SLO
898202	U	1987-1997	Central Valley Grasslands: Carrizo Plain. Land owner: U.	SLO

1815913	U	1986	Caliente Mountain, road up from Russell Ranch in Cuyama Valley. Land owner: U.	SLO
1237610	U	1952	Caliente Mountain along summit ridge. BLM.	SLO
1265950	U	1937	1.5 mi. NE of White Rock Bluff. Land owner: U.	SLO
1319033	U	1967	Elkhorn Hills. Land owner: U.	SLO
1134537	U	1995	Carrizo Plain Preserve. The Nature Conservancy?	SLO
1319067, 1318934,13198068	U	1967	Elkhorn Plains near N end; canyon in the Temblor Range. Land owner: U.	SLO

- U = Unknown
- * = an occurrence number has not been assigned
- SBNF = San Bernardino National Forest
- ANF = Angeles National Forest
- LPNF = Los Padres National Forest
- SBD = San Bernardino County
- LA = Los Angeles County
- SB = Santa Barbara County
- SLO = San Luis Obispo County

Threats

Because *Castilleja plagiotoma* is a hemi-parasitic plant, impacts to host plants as well as to individual *Castilleja plagiotoma* plants will affect this species.

Castilleja plagiotoma is threatened by road and trail maintainance and recreational activities (USDA Forest Service 2002a). At Little Pine Flat, historical impacts include vehicle disturbance, grazing, and use of a helispot. The site is located within the Deep Creek Grazing Allotment (vacant). Current threats include effects from Trials Motorcycle special use events, dispersed camping and unauthorized fuelwood collection. Fences have been installed in this area to discourage vehicle use off designated roads. During the Old Fire of 2003, dozer-line fuel breaks were constructed along Forest Road 3N14

through Little Pine Flats, impacting numerous *Castilleja plagiotoma* plants. Maintenance and/or reestablishment of this fuel break is a continued threat to this species.

On private land, development is the greatest threat to *Castilleja plagiotoma*.

Conservation and Management Considerations

The primary short-term strategy for managing this species is to improve the knowledge of its distribution so that impacts can be identified and avoided/minimized. The following is a list of conservation practices that should be considered for *Castilleja plagiotoma*:

- Implement the Pebble Plain Habitat Management Guide
- Survey all new occurrences of *Castilleja plagiotoma* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Castilleja plagiotoma* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Castilleja plagiotoma* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Castilleja plagiotoma is southern California endemic species restricted to a narrow band of habitat along the southern and western edge of the Mojave Desert, where desert transitions to the northern slope of the transverse range, following the San Andres fault rift zone northward along the dry eastern transition zones of the southern coast ranges. It's distribution within the province is peripheral to the primary distribution. It is restricted to the northern slopes of the SBNF and ANF. In the San Bernardino Mountains, the species is associated with the pebble plains of the Coxey complex. Some of these pebble plains are protected from identified threats, although most of this species habitat is not well protected from identified threats.

Based on the above analysis, *Castilleja plagiotoma* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	A	C	A

Castilleja plagiotoma is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Castilleja plagiotoma* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution. The viability of this species on the SBNF is tied to protection and management of pebble plain habitat.

Under Alternative 1, *Castilleja plagiotoma* would continue to be at risk from unauthorized vehicle travel off Forest Transportation System roads and trails. There is an existing area zoned Back Country Non-motorized (BCNM) at Little Pine Flat that would provide some protection, and habitat in Little Rock canyon would be included in a Critical biological zone. Under Alternatives 2 and 4, the Coxe and Little Rock Critical Biological zones, and BCNM zoning at Little Pine Flat would provide additional protection for this species. Under Alternative 4a, BCMUR zoning of Forest Road 3N41 would provide some protection from vehicular and road maintenance impacts. Under Alternative 3, the Coxe, and Little Rock Critical Biological zones, and the Deep Creek proposed wilderness (including Little Pine Flat) would provide substantial protection for this species. Under Alternative 5, land use zoning would not provide any protection. Under Alternatives 4a and 6, more extensive BCNM zoning across the range of the species, along with the Coxe and Little Rock Critical Biological zones would provide substantial protection.

Consideration of the Suitable Use restricting vehicle travel to designated Forest Transportation System roads and trails, along with Standards regarding recreation factor into the outcomes. Implementation of the Pebble Plain Habitat Management Guide is key to these outcomes under all alternatives.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

The habitat for *Castilleja plagiotoma* on private lands in the high desert and the southwestern Great Central Valley, have been highly reduced and fragmented by agricultural, residential, and commercial development. Some important areas of habitat outside the planning area have been protected, largely in and around the Carrizo Plain. Habitat for this species within the planning area is an important but relatively minor portion of the overall species distribution. The remaining occurrences on private land

continue to be lost as continued development occurs. This loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF.

By maintaining the current distribution of *Castilleja plagiotoma* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Castilleja plagiotoma* to suffer a decline in its overall distribution.

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Personal communication

Pratt, Gordon. Entomologist. University of California, Riverside. [Email to Robin Eliason, San Bernardino National Forest, Mountaintop District Biologist] 2 May 2005.

Castilleja montigena

**Caulanthus amplexicaulis var.
barbarae**

Caulanthus amplexicaulis var. barbarae

Caulanthus amplexicaulis Watson var. *barbarae* (J. T. Howell) Munz (Santa Barbara jewelflower)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G3?T1, S1.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Caulanthus amplexicaulis var. *barbarae* is endemic to the San Rafael Mountains of Santa Barbara County (Buck 1993). Five occurrences have been documented (California Native Plant Society 2001, California Natural Diversity Database 2004, CalFlora 2002, Forest Service files 2002).

Distribution in the Planning Area

All five of the reported occurrences of *Caulanthus amplexicaulis* var. *barbarae* are located on the Los Padres National Forest: one south southwest of Cachuma Saddle, one 2 miles east of Camp Figueroa, one between Figueroa Mountain and Zaca Peak (on the Davis - Cody Road) (California Natural Diversity Database 2004, CalFlora 2002), and one at the White Rock Mine northwest of Cachuma Saddle (unpublished data on file, Frazier Park, Calif.).

Taxonomy and Natural History

Caulanthus amplexicaulis var. *barbarae* is a dicot in the mustard family (Brassicaceae). There are two varieties of *Caulanthus amplexicaulis*. *Caulanthus amplexicaulis* var. *barbarae* differs from clasping-leaved jewelflower (*Caulanthus amplexicaulis* var. *amplexicaulis*) by the yellow or cream-colored (purple in var. *amplexicaulis*) sepals (Buck 1993).

Caulanthus amplexicaulis var. *barbarae* is a slender annual, 4-20 inches (1-5 dm) tall. The basal leaves are oblong to oblanceolate, coarsely dentate, and up to 4 inches (10 cm) long. The cauline leaves are widely ovate, entire to dentate, sessile and clasping. The inflorescence is open and few flowered. The

sepals are pouched, 1/8-1/3 inch (4-9 mm) long, usually reflexed, and yellowish to cream colored. The petals are 1/4-3/4 inches (7-18 mm) long and purple, with reflexed tips and wavy margins. *Caulanthus amplexicaulis* var. *barbarae* blooms from May–July (California Native Plant Society 2001).

Caulanthus amplexicaulis var. *barbarae* appears to be self-compatible but its protandry limits self-pollination in wild populations.

Habitat Description

Caulanthus amplexicaulis var. *barbarae* grows primarily on serpentine soils, often in crevices of bedrock or on disturbed slopes and banks, near Sargent cypress forest and gray pine woodland, and openings in chaparral, at elevations of 3,400-4,000 feet (1,040-1,220 meters) (California Natural Diversity Database 2004, CalFlora 2002).

Occurrence Status

OCCURRENCE DATA - *Caulanthus amplexicaulis* var. *barbarae* (Santa Barbara Jewelflower)

CNDDDB Occ. # or UCR voucher #	CalFlora ID	Occ. Size	Date Observed	Location/Owner
1	889099 1819466 1099463	150-200 10	1961 1962 1977 1994 1995	0.7 mi. ssw of Cachuma Saddle on Figueroa Road to Ranger Peak (CNDDDB & Smith 6953); in rocky crevices on 50 foot. serpentine cliff (Breedlove 466)/LPNF
2	1815916 1099458	30	1965 1977 1995	2.0 mi. e of Figueroa Camp (Muller 1302)/LPNF
3	1307491 1819465 1815936 1099419	79 1000 + ~500	1962 1962 1965 1977 1993 1994 1995	Between Zaca Peak & Manzana Creek, between Figueroa Mountain and Zaca Peak, se edge of Sargent Cypress grove (Hardham 10458, Blakley 6548)/LPNF

*	*	600+ ~300	1994 1995	Chromite Mine, White Rock Canyon Trail, near Cachuma Saddle/LPNF
92418 (UCR)	U	U	1994	Santa Barbara, Chrome Mine and Mill White Rock Cyn., NE of Ranger Peak, elev. 3800 ft. (Blakley/UCR)
106036 (UCR)	U	U	1994	Santa Barbara, along Rd. to Dabney Cabin, 4.4 mi. from locked gate near Davy Brown Campground, E. of Zaca Lake. (Smith/UCR)

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- LPNF= Los Padres National Forest
- UCR= University of California Riverside herbarium

Threats

Vulnerability of *Caulanthus amplexicaulis* var. *barbarae* on National Forest System lands is considered to be moderate (Stephenson and Calcarone 1999). Potential threats to *Caulanthus amplexicaulis* var. *barbarae* on the Los Padres National Forest include road maintenance, fire suppression activities during wildfire, competition from nonnative plants, and possible trampling as a result of dispersed recreational uses around historic mining sites. There is currently no grazing in the areas occupied by *Caulanthus amplexicaulis* var. *barbarae*.

Conservation and Management Considerations

Caulanthus amplexicaulis var. *barbarae* appears to respond positively to fall fires (Pepper pers. comm. 1995) and this and other information on the life history and habitat requirements of *Caulanthus amplexicaulis* var. *barbarae* is needed for occurrences on National Forest System lands.

The occurrence located near White Rock Canyon Trail may experience periodic impacts from off-trail bicycle use. The magnitude of this impact needs to be determined. If this activity is resulting in habitat loss or degradation then the use of natural barriers and signs to direct use away from *Caulanthus amplexicaulis* var. *barbarae* habitat should be utilized. Establish monitoring project for occurrences

located adjacent to roads. Monitor impacts associated with road use and maintenance.

Evaluation of Current Situation and Threats on National Forest System Lands

Caulanthus amplexicaulis var. *barbarae* is an uncommon, narrow endemic, known from only five occurrences in San Rafael Mountains. Potential threats to *Caulanthus amplexicaulis* var. *barbarae* on the Los Padres National Forest include road maintenance, fire suppression activities during wildfire, competition from nonnative plants, and possible trampling as a result of dispersed recreational uses around historic mining sites.

Based upon the above analysis *Caulanthus amplexicaulis* var. *barbarae* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Caulanthus amplexicaulis var. *barbarae* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Current habitat conditions are stable for *Caulanthus amplexicaulis* var. *barbarae*, although there are some gaps in historic distribution as a result of road construction through habitat. Habitat would remain stable under all alternatives except under Alternative 5; under this alternative, all of the known occurrences and most of the unsurveyed potential habitat for this species would be within the Back Country land use zone. Occurrences in the Back Country land use zone would continue to be threatened by road maintenance, invasion by nonnative plants, and the effects of dispersed recreation. Under Alternatives 3 and 6, two occurrences of *Caulanthus amplexicaulis* var. *barbarae* and most of the species' potential habitat would be located within the Back Country Non-Motorized land use zone and these occurrences and habitat would be at less of risk of being affected by human disturbance.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

All of the known populations of *Caulanthus amplexicaulis* var. *barbarae* are found on the Los Padres National Forest; therefore, the predicted outcomes for all lands are the same as the predicted outcomes for National Forest System lands.

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Castilleja plagiotoma

Caulanthus californicus

Caulanthus californicus

Caulanthus californicus (Watson) Pays. (California jewelflower)

Management Status

Federal: Endangered (55 Federal Register [FR] 29361, July 19, 1990);

California: Endangered.

Heritage Rank: G1 S1.1 – very threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Caulanthus californicus is historically known from the San Joaquin Valley and adjacent Sierra Nevada foothills (Fresno, Kern, and Tulare Counties), the Carrizo Plain (San Luis Obispo County), the Cuyama Valley (Santa Barbara and Ventura Counties), and the foothills west of the San Joaquin Valley (Fresno, Kern, and Kings Counties) (California Natural Diversity Database 2004). *Caulanthus californicus* is presently known from occurrences in three centers of concentration: Santa Barbara Canyon in Santa Barbara County, the Carrizo Plain in San Luis Obispo County, and the Kreyenhagen Hills in Fresno County (Williams and others 1998).

Distribution in the Planning Area

Caulanthus californicus has not been found on National Forest System lands; however, occurrences in Santa Barbara Canyon are located within 3 miles of the Los Padres National Forest. The Santa Barbara Canyon occurrences comprise 19 sites along a 6-mile (9.7 kilometer) stretch of terrace habitat on the western side of the Cuyama River (USDA Forest Service 2000). The total area of occupied habitat is estimated at 30 acres (12 hectares), on both private and Bureau of Land Management-administered lands (Stephenson and Calcarone 1999). Despite the presence of potential habitat on National Forest System lands, repeated field surveys that covered hundreds of acres over a period of years (Danielsen and others 1994, Foster 2003, Magney 1988) have been unsuccessful in locating the species. Results of these surveys and maps showing the areas visited are on file at the Los Padres National Forest.

Taxonomy and Natural History

Caulanthus californicus is a dicot in the mustard family (Brassicaceae) (California Native Plant Society 2001).

Caulanthus californicus is an annual herb that blooms February-May (California Native Plant Society 2001).

Habitat Description

Caulanthus californicus grows on gravelly or sandy soils in grasslands, chenopod scrub, and pinyon-juniper woodlands at elevations of 200-3,300 feet (61–1,006 meters) (Stephenson and Calcarone 1999, California Native Plant Society 2001). *Caulanthus californicus* is pollinated by insects, most likely by bees (Williams and others 1998). Bees are the most abundant visitors to the flowers of jewelflower species, although the flowers also are visited by flies, butterflies, beetles, and even hummingbirds (Kruckeberg 1957, Moldenke 1976, Preston 1994).

Occurrence Status

Caulanthus californicus is distributed in several highly restricted occurrences and is considered to be in danger of extinction throughout its range (California Native Plant Society 2001). Twenty-four of the occurrences listed by the California Natural Diversity Database (2004) are believed to be extirpated, and the California Native Plant Society (2001) reports that 35 historical occurrences have been extirpated. Population trends for *Caulanthus californicus* are declining (Stephenson and Calcarone 1999).

Threats

No risks to *Caulanthus californicus* are identified on National Forest System lands because the species is not known to occur there.

Conservation and Management Considerations

A recovery plan including *Caulanthus californicus* was completed in 1998 (Williams et al. 1998). There are no objectives listed for National Forest System lands. If *Caulanthus californicus* is discovered on National Forest System lands, appropriate management measures should be implemented, including avoiding activities that would disturb the plants or the pollinator population and addressing the species in grazing and fire management plans for the area (USDA Forest Service 2000).

Two attempts were made to grow *Caulanthus californicus* from seed at suitable locations in Santa Barbara and Deer Park Canyons on the Los Padres National Forest (Stephenson and Calcarone 1999). Germination and subsequent production of seed was successful in 1989; however, the number of individuals produced each year after that gradually declined until 1995 when no plants were found at either site. Monitoring in 1997, 1998, 1999, 2000, and 2003 found no plants evident at either site

(Williams and others 1998, Stephenson and Calcarone 1999, USDA Forest Service 2003).

Evaluation of Current Situation and Threats on National Forest System Lands

Caulanthus californicus once occurred over a wide part of California but is now restricted to three disjunct areas, one of which is adjacent to the Los Padres National Forest. However, botanical surveys conducted in 2003 using a U. S. Fish and Wildlife Service approved protocol failed to detect any *Caulanthus californicus* and it is now concluded that *Caulanthus californicus* does not occur on the Los Padres National Forest.

Based upon the above analysis *Caulanthus californicus* has been assigned the following threat category:

1. Not found in Plan area.

Viability Outcomes

No populations of *Caulanthus californicus* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Caulanthus californicus*.

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**Caulanthus amplexicaulis var.
barbarae**

Caulanthus lemmonii

Caulanthus lemmonii

Caulanthus lemmonii S. Watson (Lemmon's jewelflower)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G4T2 S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Caulanthus lemmonii has a rather wide distribution, ranging through the inner and outer south Coast Ranges to the southwestern San Joaquin Valley (Buck 1993). *Caulanthus lemmonii* formerly occurred in the eastern San Francisco Bay area but is now considered extirpated in Alameda County (California Native Plant Society (2001)). *Caulanthus lemmonii* is reported from Monterey County (Matthews 1997, CalFlora 2002), the northern Temblor Range and the Greenhorn Mountains of Kern County (Twisselmann 1995), and from the Caliente Range, Carrizo Plain, Cuyama Valley, and La Panza Range of San Luis Obispo County (Hoover 1970, CalFlora 2002).

Distribution in the Planning Area

Caulanthus lemmonii is found on or adjacent to the Los Padres National Forest at Ballinger Canyon (Smith 1998), near Highway 33 in the upper Cuyama River watershed, near Neasons Flat on the Wind Wolves Preserve, and in the La Panza Range (CalFlora 2002). The exact locations of these occurrences are unknown. There are also reports (CalFlora 2002) that *Caulanthus lemmonii* is found east of the Monterey Ranger District in the Arroyo Seco watershed (Constance 2081 (UC), Hoover 2982 (UC)) and the Jolon/Lockwood Valley area suggesting that potential habitat for this species may be present on the district. *Caulanthus lemmonii* is also reported from the San Luis Obispo area (Baldwin s.n. (CAS), (Painter 2004).

Taxonomy and Natural History

Caulanthus lemmonii is a dicot in the mustard family (Brassicaceae) and is distinguished by its glabrous

lower parts and erect to ascending pods (Buck 1993). *Caulanthus lemmonii* is an annual herb that flowers March–May (California Native Plant Society 2001).

Smith (1998) noted that the taxon needed further study. This taxon will be treated as *Caulanthus lemmonii* in Flora of North America (Painter 2004). See Jepson Flora Project (2005) for name change information.

Habitat Description

Caulanthus lemmonii grows in pinyon and juniper woodland and in valley and foothill grassland at elevations of 265–4,000 feet (80–1,220 meters) (California Native Plant Society 2001). Matthews (1997) describes the habitat as "dry hillsides." Twisselmann (1995) describes the substrate as "poor soil or fine clay."

Occurrence Status

There is no data available on the size and vigor of the occurrences of *Caulanthus lemmonii* that are found on or adjacent to the Los Padres National Forest.

OCCURRENCE DATA – *Caulanthus lemmonii* (Lemon’s Jewelflower)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
4	U	1986	PADRONES CANYON, CALIENTE RANGE. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, IN PADRONES CANYON NE OF NEW CUYAMA, AT THE CORRESPONDING ELEVATION PROVIDED BY TAYLOR, T11N/R26W/S34	SLO
5	U	1937	1.0 MILE NE OF CUYAMA RANCH. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, 1.0 MILE NE OF CUYAMA RANCH, SW OF PADRONES CANYON, NEAR THE NEW RIVER, T10N/R26W/S03	SLO

7	U	1986	NEAR SELBY RANCH COW CAMP. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, IN THE VICINITY OF SELBY RANCH COW CAMP, T32S/R20E/S16	SLO
9	U	1962	13.2 MILES WEST OF MCKITTRICK ON ROAD TO CARRIZO PLAIN, TEMBLOR RANGE. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, ALONG HWY 58 (178), APPROX. 13.2MILES NW OF MCKITTRICK IN THE TEMBLOR RANGE, SAN DIEGO CREEK DRAINAGE, T30S/R20E/S09	SLO
10	U	1937	PLACER CREEK AND SAN JUAN CREEK. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, IN THE VICINITY OF THE CONFLUENCE OF PLACER AND SAN JUAN CREEKS, ESE OF LA PANZA, AND NE OF BEARTRAP SPRING, T30S/R17E/S03	SLO
11	U	1934	6.0 MILES NE OF POZO.EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, APPROX. 6.0 MILES NE OF POZO ALONG THE POZO GRADE, E OF POZO SUMMIT, T30S/R16E/S05	SLO

12	U	1932	NEAR JUNCTION OF CARRIZO PLAIN WITH BITTERWATER VALLEY ROAD. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, IN THE VICINITY OF SIMMLER-BITTERWATER ROAD AND THE START OF THE CARRIZO PLAIN, T29S/R18E/S06	SLO
13	U	1940	2.0 MILES NE OF LA PANZA. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, 2.0 MILES NE OF THE TOWN OF LAPANZA, SW OF LA PANZA RANCH AT HWY 58, T29S/R17E/S19	SLO
14	U	1967	SHELL CREEK, JUST ABOVE THE CONFLUENCE WITH FERNANDEZ CREEK. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, AT THE CONFLUENCE OF SHELL AND FERNANDEZ CREEKS AT HWY 58, S OF CAMATTA CANYON, T28S/R15E/S26	SLO
15	U	1962	HWY 466, 4.0 MILES WEST OF THE KERN COUNTY LINE, AND 2.0 MILES NE OF THE JUNCTION OF HWY 41 AND HWY 466. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, ALONG HWY 466, 4.0 MILES WEST OF THE KERN COUNTY LINE, NE OF CHOLAME, T25S/R16E	SLO

17	U	1935	ALONG GRADE AT WEST END OF CHOICE VALLEY, 3.5 MILES FROM ANNETTE. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, WEST OF ANNETTE AT THE NW END OF CHOICE VALLEY, T26S/R16E/S23	SLO
19	U	1935	CHOLAME. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, IN THE VICINITY OF CHOLAME, T25S/R16E/S30	SLO
20	U	1932	HILLSIDE ON WEST SIDE OF HIGHWAY, 6.0 MILES NORTH OF PASO ROBLES. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, 6.0 MILES NORTH OF PASO ROBLES, T25S/R12E/S29	SLO
21	U	1929	PASO ROBLES. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, IN THE VICINITY OF PASO ROBLES, T26S/R12E	SLO
22	U	1937	3.3 MILES NNW OF CHIMNEY ROCK. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, APPROX. 3.3 MILES NNW OF CHIMNEY ROCK, EAST OF THE WHITE RANCH, T25S/R11E/S30	SLO

23	U	1950	ALONG HWY 41, 3.2 MILES FROM THE JUNCTION WITH HWY 466 NEAR CHOLAME. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, ALONG HWY 41, 3.2 MILES EAST OF THE JUNCTION WITH HWY 466 NE OF CHOLAME, WEST OF COTTONWOOD PASS, T25S/R16E/S02	SLO
25	U	1991	0.2 MILE SOUTH OF SAN ANTONIO DAM, ALONG ROAD AND EAST OF ROAD. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, ALONG ROAD 0.2 MILE S OF SANANTONIO DAM, T24S/R10E/S34	MON
26	U	1938	2.0 MILES NW OF BEE ROCK, SAN ANTONIO RIVER DRAINAGE, SW OF BRADLEY. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, 2.0 MILES NW OF BEE ROCK, WEST OF THE HARRIS CREEK ARM OF SAN ANTONIO RESERVOIR, T24S/R09E/S26	MON
28	U	1932	VINEYARD CANYON.EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, IN VINEYARD CANYON AT THE CORRESPONDING ELEVATION PROVIDED BY LEWIS, SOUTH OF THE NARROWS., T24S/R13E/S04	MON

29	U	1936	JOLON-BRADLEY ROAD, 12.0 MILES FROM JOLON. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, ALONG JOLON-BRADLEY ROAD APPROX. 12.0 MILES SE OF JOLON, WEST OF HAMES VALLEY, T23S/R09E/S26	MON
30	U	1952	SETTLEMENT NEAR LOCKWOOD, 6.0 MILES SE OF JOLON. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, APPROX. 6.0 MILES SE OF JOLON, SW OF LOCKWOOD, T23S/R08E/S15	MON
31	U	1952	1.4 MILES SOUTH OF LONE OAK, BETWEEN LONE OAK AND HWY 198. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, ALONG HWY 25, 1.4 MILES SOUTH OF LONOAK, NORTH OF HWY 198, T19S/R10E/S19	MON
32	U	1956	7.0 MILES FROM GREENFIELD ON ARROYO SECO ROAD. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, 7.0 MILES SW OF GREENFIELD ON ARROYO SECO ROAD, IN THE VICINITY OF SWEETWATER CREEK, T19S/R06E/S19	MON
36	U	1935	5.0 MILES EAST OF CHOLAME. EXACT LOCATION UNKNOWN. MAPPED AS BEST GUESS BY CNDDDB, ON HWY 466, 5.0 MILES EAST OF CHOLAME, T25S/R16E/S23	SLO

67 (SBBG)	U	U	Camp Roberts. Maps are available from Camp Roberts Environmental Office. (Painter 2004).	SLO
230 (SBBG)	U	U	Camp Roberts. Maps are available from Camp Roberts Environmental Office. (Painter 2004).	SLO
236a (SBBG)	U	U	Camp Roberts (Painter & Wetherwax, in prep.) Maps are available from Camp Roberts Environmental Office (Painter 2004).	SLO

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SLO= San Luis Obispo County*
- *MON= Monterey County*
- *SBBG = Santa Barbara Botanic Garden*

Threats

Off of public land, *Caulanthus lemmonii* is at risk from habitat conversion to urban development (California Native Plant Society 2001). The status of *Caulanthus lemmonii* on National Forest System (NFS) lands is unknown. It is possible that undetected occurrences of *Caulanthus lemmonii* on the east side of the Santa Lucia and Mount Pinos Ranger Districts could be affected by livestock grazing and/or off highway vehicle use.

Threats and possible threats at Camp Roberts include sheep, trespassing cattle, non-native plants, military training activities, too frequent fires, fires in wrong season, feral pigs, proposed mining of shale, trampling, soil compaction, and dust (Painter 2004).

Conservation and Management Considerations

More information is needed on the Los Padres National Forest occurrences of *Caulanthus lemmonii*.

Evaluation of Current Situation and Threats on National Forest System Lands

Caulanthus lemmonii is mostly peripheral to the planning area, with most of its current and historic range located to the east and north of the Los Padres National Forest. The limited amount of habitat found on NFS land may be threatened by grazing and/or dispersed recreation, including the operation

and use of off highway vehicle trails.

Based upon the above analysis *Caulanthus lemmonii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Current habitat conditions are stable for *Caulanthus lemmonii*, although there are likely some gaps in historic distribution as a result of road construction through habitat. Habitat would remain stable under all alternatives except under Alternative 5; under this alternative, the impacts resulting from increased emphasis on motor vehicle based recreation may result in increased habitat fragmentation and larger gaps between populations. This is because habitat for *Caulanthus lemmonii* – open pinyon and juniper woodlands and grasslands – are accessible to livestock and people and are more prone to impacts from unauthorized off road travel.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Urbanization and development of rangelands for roads and dispersed recreation have resulted in lost habitat and habitat fragmentation on private lands. This habitat fragmentation has caused substantial gaps in the historic distribution of *Caulanthus lemmonii*.

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Caulanthus californicus

Caulanthus simulans

Caulanthus simulans

Caulanthus simulans Payson (Payson's jewelflower)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3, S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-3

General Distribution

Caulanthus simulans occurs in Riverside and San Diego counties (California Native Plant Society 2001).

Distribution in the Planning Area

Caulanthus simulans occurs on the Cleveland National Forest and the San Bernardino National Forest, occupying about 23 acres (Stephenson and Calcarone 1999). Within the Cleveland National Forest, *Caulanthus simulans* occurs along High Point truck trail, in an open area beside Thing Valley Road, and along Barker Valley Trail southwest of Palomar Divide Road (Cleveland National Forest occurrence records). Another population reported along Bedford truck trail (CNDDDB Occ. # 16) was misidentified (actually *C. heterophyllus* var. *pseudosimulans*).

Within the San Bernardino National Forest, *Caulanthus simulans* occurs within the San Jacinto Mountains along the road to the dump in Pinyon Flats and along Bonita Vista Drive west of Cedar Crest (California Natural Diversity Database 2004). Other locations provided in the table below are from White 2001.

Populations are found on lands managed by the Bureau of Land Management and Anza-Borrego Desert State Park, and many of the known occurrences are located on private lands (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Caulanthus simulans is an erect annual, 20-60 cm with spreading-bristly hairs. Stems are branched with leaves that are less than 10 cm long. Plants have cream yellow petals, 5-10 mm and sepals 3-7 mm (Buck 1993), and flower from April to May. Plants are often confused with *C. heterophyllus* var. *pseudosimulans* (CAHEP), especially in Santa Ana Mountains (USDA Forest Service 1998). *Caulanthus simulans* is a fire following herb (USDA Forest Service 1998).

Habitat Description

Caulanthus simulans grows in sandy, granitic soil within chaparral and coastal sage scrub, often on the desert side of the mountains (Buck 1993, Reiser 1994, California Native Plant Society 2001). It also is found in streambeds and on steep, rocky slopes (Stephenson and Calcarone 1999).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 51 occurrences (California Natural Diversity Database). Four of these CNDDDB occurrences are old, unconfirmed records that are presumed extant, and 12 of the records may possibly be misidentified according to Roy Buck (California Natural Diversity Database 2004). The majority of these occurrences are on lands protected by federal, state, or local agencies (e.g. Anza Borrego State Park, Bureau of Indian Affairs, Bureau of Land Management, Cuyamaca State Park). There are two occurrences in the San Bernardino National Forest (California Natural Diversity Database 2004) and eight occurrences known on the Cleveland National Forest (CNF occurrences records). Population numbers vary from 30 to 75 per occurrence off National Forest System lands (California Natural Diversity Database 2004). On the Cleveland National Forest between 100 to over 1000 plants are recorded occur per occurrence.

OCCURRENCE DATA of *Caulanthus simulans* (Payson's jewelflower) on or near National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
*	2-1	100-1000	1979	High Point Road / CNF	SD
*	2-2	50-75	1979	High Point Road / CNF	SD
*	2-3	100-1000	1979	High Point Road / CNF	SD

*	2-4	11-50	1979	High Point Road / CNF	SD
*	2-13	100+	1990	Barker Valley / CNF	SD
*	2-14	100+	1990	Barker Valley / CNF	SD
*	2-15	100+	1990	Barker Valley / CNF	SD
*	2-17	U	1971	Thing Valley Road / CNF	SD
*		U	1968	Hwy 243 ca. 3000 feet in recent burn. Collected in May, housed UCR. (White 2001).	RIV
*		U	1995	Bonita Vista Rd. near Apple Canyon Rd. in chaparral. Hirshberg collected, housed at UCR (White 2001)	RIV
*	*	U	U	Pinyon Flats. Collected by Ziegler, housed at UCR (White 2001)	RIV
*	*	U	U	Splitler Peak Tr. ca. 5,700 ft. (White 2001)	RIV
*	*	U	U	El Toro Mt. Collected by Hall, housed at UC, SMASCH (White 2001)	RIV

- * = An occurrence number has not been assigned.
- U= Unknown
- CNF= Cleveland National Forest
- SD= San Diego County
- RIV= Riverside County

Threats

Populations of *Caulanthus simulans* on private lands are threatened by development and nonnative species invasions (California Natural Diversity Database 2004). On National Forest System lands all the occurrences are located along roadsides and trails. Trampling and nonnative weed invasions may also affect occurrences. In addition, fuel break construction and maintenance along ridges and/or roads where these populations occur may also contribute to nonnative weed invasions and trampling if maintenance activities occur before plants annually set seed.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Caulanthus simulans*:

- Monitor and map all habitat and species occurrences on the Cleveland and San Bernardino National Forests, and incorporate these occurrences into the Sensitive Plant Atlas.
- Observe and document source and intensity of disturbance if noted on site. Compile information across Forests to aid in management of this taxon.
- Allow wildland fires to freely burn through any known occurrences. Minimize earth-movement during fire suppression activities when these annual plants are emergent. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. The use of hand line for fuel break construction is preferred.
- Minimize activities during flowering and before seed set of plants in occupied habitat.
- Do not develop trails, campgrounds, roads, or other constructed facilities in known habitat.

Evaluation of Current Situation and Threats on National Forest System Lands

Caulanthus simulans is considered to have low to moderate vulnerability on National Forest System lands due to the proximity of occurrences to roadsides and trails and some apparent affinity to disturbance. It is unknown whether proximity of all known occurrences to roads and trails on the Forest is because the species may benefit from disturbance or because those are the only places botanists have really looked for the plant. Roads and trails are corridors for invasive weeds which can degrade habitat. In addition, plants may have a higher potential of being trampled along roads and trails. If the species is disturbance-adapted, moderate levels of trampling may be beneficial by suppressing competing vegetation. The trend for this species appears to be stable on the National Forest System lands, current Forest Service activities do not have substantial negative effects on this plant.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Caulanthus simulans is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Caulanthus simulans* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Caulanthus simulans* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Personal Communication

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Caulanthus lemmonii

Ceanothus cyaneus

Ceanothus cyaneus

Ceanothus cyaneus Eastwood (Lakeside ceanothus)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-2

General Distribution

Ceanothus cyaneus, lakeside ceanothus, occurs in the southern Peninsular Ranges of San Diego County and Baja California, Mexico (Schmidt 1993). The shrub is found in San Diego County from Crest to the foothills of Lakeside, including significant populations on El Cajon Mountain (Reiser 1994). The species can be common within this narrow range.

Distribution in the Planning Area

Ceanothus cyaneus is present at four locations on El Cajon Mountain on the Cleveland National Forest (California Natural Diversity Database 2004). Another reported location is mapped near Devil's hole east of Wildhorse Peak. Most occurrences are outside National Forest System lands.

Taxonomy and Natural History

Ceanothus cyaneus is an evergreen shrub (3-16 feet) with long terminal shoots and gray-green branches. Twigs are angled with scattered brownish glands, becoming gray green. Leaves are less than 1.5 cm, oblanceolate to round-obovate, cupped in shaped, dark green and glabrous above and paler below, puberulent on the veins. Margins are toothed above the middle or entire. Flowers are to bright blue, blooming from March to June. Fruits are about 4 mm, smooth and shiny and shallowly 3-lobed, with minute to no crest present (Schmidt 1993). Beetles are the potential pollinators (Klein pers. comm.).

Ceanothus cyaneus appears to hybridize with other congeners (*C. leucodermis* and *C. tomentosus*), and plants outside the Crest or El Cajon Mountain areas may be hybrids (Reiser 1994).

Habitat Description

Ceanothus cyaneus occurs in chaparral and closed-cone conifer habitats at elevations of 770–2,500 feet (235–755 meters) (California Native Plant Society 2001). It generally is found in inland mixed chaparral, which tends to be taller and more mesic than other woody scrub communities in the region (Reiser 1994). It occurs in thick, impenetrable stands of chaparral with other shrubs, such as chamise and manzanita. *Ceanothus cyaneus* could be considered a dominant species at some of the areas where it occurs (USDA Forest Service 1998). It also occurs in Tecate cypress forest on Otay Mountain (California Natural Diversity Database 2004). At Crest locations (off of National Forest System lands) the soil types are mapped as Acid Igneous rock land and Cieneba very rocky coarse sandy loam.

Occurrence Status

The California Natural Diversity Database (CNDDDB) list 26 occurrences for *Ceanothus cyaneus* (California Natural Diversity Database 2004). The majority of these occurrences are on private lands (65%) with the remaining protected on federal lands (Bureau of Indian Affairs, Bureau of Land Management, USDA Forest Service) and one population within an Audubon Sanctuary. Many of these occurrences are older or unconfirmed sightings. In addition those sightings not within the El Cajon Mountain or Crest area may be hybrids. On National Forest System lands, the Cleveland National Forest had four occurrences near the El Cajon Mountain area and a possible occurrence at Devil's hole east of Wildhorse Peak.

OCCURRENCE DATA - *Ceanothus cyaneus* (Lakeside Ceanothus)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
*	2-1	120	1983	Sycuan Truck Trail / private	SD
*	2-2	U	1964	El Cajon Mt. area / CNF	SD
*	2-3	U	1976	El Cajon Mt. area / CNF	SD
6	2-4	20	1993	El Cajon Mt. area / CNF	SD

4	2-5	2	1993	El Cajon Mt. area / CNF	SD
13	2-6 (no paper record in files)	U	1931	Devil's hole / CNF	SD

- *U = Unknown.*
- ** = an occurrence number has not been assigned.*
- *CNF = Cleveland National Forest*
- *SD = San Diego County*

Threats

At the Crest area, populations may be threatened by encroaching development projects, however, 20% of the plants in this area are protected in an open space easement (California Natural Diversity Database 2004). Populations along El Cajon Truck Trail (Forest Road 13S10) on the Cleveland National Forest are stable with no known threats. High fire-return interval may type-convert the dense chaparral to nonnative grasslands.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Ceanothus cyaneus*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest and incorporate these occurrences into the Sensitive Plant Atlas.
- Maintain the geographic and genetic diversity of the species or "evolutionary unit" by protecting all known populations on Federal lands. Promote genetic studies of potential/putative hybrids (Painter 2004).
- Prevent high fire-return interval wildland fires from burning through The El Cajon Mountain occurrences. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. Use ridgelines or base of mountains for fuel break construction. The use of hand line for fuel break construction is preferred.

Evaluation of Current Situation and Threats on National Forest System Lands

Ceanothus cyaneus is considered to have low vulnerability on National Forest System lands. These populations are currently stable with no known threats from Forest Service activities. However, these

populations may experience local extirpation in the event of a catastrophic event due to the localized occurrences with small population numbers (between 20-120 per site).

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Ceanothus cyaneus is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Ceanothus cyaneus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Ceanothus cyaneus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

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Caulanthus simulans

Ceanothus ophiochilus

Ceanothus ophiochilus

Ceanothus ophiochilus Boyd, Ross & Arnseth (Vail Lake ceanothus)

Management Status

Federal: Threatened (63 FR 54956-54971, 13 October 1998)

California: Endangered

Heritage Rank: G1, S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

There is no Critical Habitat designated or proposed for this species.

General Distribution

Ceanothus ophiochilus is endemic to southern Riverside County in the Vail Lake area, currently known from four occurrences.

Distribution in the Planning Area

Within the southern California National Forest System lands, *Ceanothus ophiochilus* is only known from the Cleveland National Forest (CNF). The CNF has three occurrence records for *Ceanothus ophiochilus*, all located within the Agua Tibia Wilderness. One additional occurrence, the type locality, is located on private land to the north of the CNF (California Natural Diversity Database 2004).

Taxonomy and Natural History

Ceanothus ophiochilus is an erect shrub in the buckthorn family (Rhamnaceae) with round red-brown, glabrous twigs, becoming ashy gray. Leaves are less than 7 mm, opposite, clustered or not, and evergreen with persistent stipules. Blades are entire, narrowly oblanceolate to ovate, 1-ribbed near base, thick, firm, with rounded to acute tips. Upper blade surface is glabrous and the lower surface is pale green. The inflorescence is generally raceme-like and less than 1 cm. Flowers are pale blue and sometimes pinkish. Fruits are 3-3.5 mm, smooth and without horns (Schmidt 1993). Plants flower from February to March (California Native Plant Society 2001).

Ceanothus ophiochilus is a member of section *Cerastes* of *Ceanothus*. This species is distinguished from other members of this group by several morphological features. In addition, leaves are glabrous, especially on the under side. Other species in this group are characterized with pubescent leaves. The most distinguishable characteristic of *Ceanothus ophiochilus* is its small, narrow leaves with a gibbous abaxial surface (Shaffer 1993).

The *Cerastes Ceanothus* group lacks the ability to crown-sprout and relies solely on seed regeneration after fire. Although fire disturbance is needed for germination to occur, too frequent fires can hinder its ability to produce enough mature seeds for regeneration after a second fire. *Ceanothus ophiochilus* needs long periods between consecutive fires to maintain viability and can require 10-20 years to replenish seeds banks following fires (Shaffer 1993). Populations experiencing too-short fire intervals are at risk of extirpation (Zedler and others 1983). Zedler and others (1983) found that *Ceanothus oliganthus*, also an obligate seeder, was almost eliminated from a site that had burned twice within two years.

Ceanothus ophiochilus readily hybridizes with *C. crassifolius*. The occurrence at the type locality at Vail Lake appears to be a pure stand. Hybrids were only located at the periphery of the stand and metasedimentary substrate (Schaffer 1993). At the three occurrences in the Agua Tibia range, hybrids make up 5-10% of stands. Pure *C. ophiochilus* individuals are immediately adjacent to *C. crassifolius* plants.

Habitat Description

Ceanothus ophiochilus is restricted to nutrient poor gabbro or metavolcanic soils on north-facing ridges on the eastern sides of mountains (Schaffer 1993). Soil series at *Ceanothus ophiochilus* occurrences are mapped as Ramona, but appear to be Las Posas series based on field review and soil samples (USDA Forest Service 1998). Plants are associated with chamise chaparral or mixed chamise/*Ceanothus greggii*/*Ceanothus crassifolius*/*Arctostaphylos glauca* chaparral at elevations of 2000-3000 feet (California Department of Fish and Game 2002; CNF occurrence record forms) exposed to extreme heat and dryness (Schaffer 1993). Associated species include *Adenostoma fasciculatum*, *Salvia mellifera*, *Eriogonum fasciculatum*, *Quercus berberidifolia*, *Arctostaphylos spp.* and *Ceanothus crassifolius* (USDA Forest Service 1998).

Occurrence Status

There are four known occurrences of *Ceanothus ophiochilus*. The type locality is located on private lands near Vail Lake, occupying approximately 20 acres. This stand is estimated to have 3,000-5,000 individual plants of uniform age class (Schaffer 1993). The remaining three occurrences are located within the Agua Tibia Mountains (Wilderness) in the Cleveland National Forest. These stands had an approximate combined total of 5,000 individuals in the early 1990s. The lower two stands (CNF record Occ. no. 2-1 and 2-2) were composed of plants approximately 50 to 100 year old with a few younger

plants of three years old. The upper site (CNF Occ. no. 2-3) consisted of both mature and young individuals. In 1993 it was estimated that 60% of this stand were mature individuals and 40% were younger plants of three to four years old. The younger plants were probably seedlings that germinated following the Vail Fire in 1989. All three sites burned in the Pechanga Fire in 2000. The Pechanga Fire burned approximately 70% of the CNF 2-1 stand, 100% of CNF 2-2, and 75% of CNF 2-3. On going monitoring of post-fire population regeneration is occurring at these sites to compare regeneration rates between the twice burned and once burned populations.

Because *C. ophiophilus* is an obligate seeder, regeneration at site 2-3 may be hindered from the short fire interval between 1989 and 2000. The short fire interval may not have permitted enough time for new plants to mature and produce mature seeds to establish new plants after the 2000 fire.

OCCURRENCE DATA - *Ceanothus ophiophilus* (Vail Lake Ceanothus)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
2	2-1	4000a	1993	Agua Tibia Wilderness / CNF	RIV
*	2-2	4000a	1993	Agua Tibia Wilderness / CNF	RIV
3	2-3	> 500	1994	Agua Tibia Wilderness / CNF	RIV

- * = an occurrence number has not been assigned
- CNF = Cleveland National Forest
- RIV = Riverside County

Threats

The type locality Vail Lake occurrence is on private land and may be threatened by development. No known changes to this proposed development have been made. It is presumed that the Vail Lake occurrence is stable.

Occurrences of *Ceanothus ophiophilus* in the Agua Tibia Mountains are threatened by short fire intervals, fire suppression activities, and the invasion of weeds. All three occurrences were completely or partially burned over and are regenerating following the 2000 Pechanga fire. Another fire through these occurrences may deplete the seed bank and young kill plants before maturity and seed set. The creation

and use of fuel breaks through and adjacent to the occurrences may serve as corridors for nonnative weed invasion. While the initial construction and use of fuel breaks during fire suppression activities may have crushed and killed plants, many new seedlings have been observed on these fuel breaks (L. Davis pers. obs.).

An old fuel break, now serving as an unofficial trail, follows and bisects portions of the Agua Tibia *C. ophiochilus* occurrences. A wilderness sign and horse gate were installed following the Pechanga Fire. However, access to this "trailhead" is through private lands and, thus, is limited for the public. The Cleveland NF does not have an easement through the private land that to access this "trailhead."

Ceanothus ophiochilus populations in the Agua Tibia Mountains are also threatened by hybridization and introgression with *C. crassifolius*. These populations may experience outbreeding depression resulting in decreased seed production and overall fitness and/or assimilation resulting in loss of genetic characteristics (Ellstrand and Elam 1993). However, Dieter Wilken states that "this does not appear to be happening due to introgression" (Painter 2004). Natural introgression and hybridization occur commonly in plant populations. However, genetic and conservation implications are more important with rare or sensitive species in small populations. If hybrid progeny plants are viable and vigorous then the sensitive parent species is at risk of assimilation, resulting in hybrid swarms, swamping the unique characteristics of the rare species. If the progeny are infertile then the rare species may be at risk of outbreeding depression (Ellstrand and Elam 1993). Dieter Wilken also states that "the progeny of hybrids are not (or not always) infertile" (Painter 2004). The degree of this potential threat is not known at this time.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Ceanothus ophiochilus*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest and incorporate these occurrences into the Sensitive Plant Atlas.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands. Promote genetic studies of hybridization events.
- Monitor regeneration of populations at Agua Tibia Mountain.
- Monitor hybridization levels at the Agua Tibia Mountain occurrences.
- Prevent wildland fires from burning through Agua Tibia occurrences until it is determined that plants/populations have matured and are producing seed.
- Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. Use ridgelines or base of mountains for fuel break construction. The use of hand line for fuel break construction is preferred.

Evaluation of Current Situation and Threats on National Forest System Lands

Ceanothus ophiochilus is considered to have moderate vulnerability to local extirpation on National Forest System lands. The Cleveland NF occurrences are at risk of local extirpation from a single catastrophic event. However, the large number of plants at these occurrences reduces this risk (Shaffer 1993). The threat of hybridization and introgression with *C. crassifolius* is greatest concern for these occurrences. Outbreeding may decrease fitness and lead to loss of genetic characteristics for this species. Mature hybrid plants at the Agua Tibia occurrences suggest that hybridization has been occurring for several years (Shaffer 1993). The California Department of Fish and Game considers these populations to have a high level of hybridization (5-10%). The Department recommends that the Agua Tibia occurrences not be considered when developing conservation plans for this species due to the level of genetic contamination at these sites. Conservation of the Agua Tibia occurrences may not increase the probability of survivorship of the species. However, conservation of these occurrences is important as they represent a significant number of plants and about 50% of the total occupied acreage for *Ceanothus ophiochilus*. Many plants are pure *Ceanothus ophiochilus*, and the level of hybridization is not clear. Although fires may pose a threat to the Agua Tibia populations, the threat is reduced, due to the recent fires. The loss of fuels from recent fires has reduced the risk of wildfire through these populations for a short period. However, the accumulation of chaparral fuels surrounding these populations will increase the risk of wildfire over time and pose a more significant threat to these populations if plants have not matured and replenished the seed bank. Current Forest Service activities do not pose a substantial threat to this species. Forest Service efforts to prevent fires from reburning the stands within the next few decades will help conserve this species.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Ceanothus ophiochilus is listed under the Endangered Species Act of 1973, as amended, as threatened, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level. Existing protections afforded this species under the Endangered Species Act provide considerable baseline protection.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Ceanothus ophiochilus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Ceanothus ophiochilus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon

to suffer a decline in its overall distribution.

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Ceanothus cyaneus

**Centromadia pungens ssp.
laevis**

Centromadia pungens ssp. laevis

Centromadia (Hemizonia) pungens ssp. laevis Keck (Smooth tarplant)

Management Status

Federal: None

California: None

Heritage Rank: G5T2, S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-3-3

General Distribution

Centromadia pungens ssp. laevis, smooth tarplant, is known from the South Coast region from San Bernardino County to San Diego County (Keil 1993). This plant is also documented in Baja California, Mexico (Reiser 1994). Western Riverside County supports more than 60% of the reported populations.

Distribution in the Planning Area

There are no known and confirmed occurrences of *Centromadia pungens ssp. laevis* within the southern California national forests. Occurrences are generally in the plains and valleys west of the San Bernardino and Cleveland national forests.

Taxonomy and Natural History

Centromadia pungens ssp. laevis is an herbaceous annual 1-12 dm tall with generally stiff, bristly branches. Lower leaves are linear-lanceolate, 5-15 cm, and deeply twice divided. Upper leaves are linear, spine-tipped, with stiff ciliate margins and are generally in axillary clusters. It is distinguished from other conspecifics by its non-scabrous leaves, solitary to few flower heads (4-6 mm) in loose clusters, and non-spine-tipped chaff scales (Keil 1993). Plants flower from April to September (California Native Plant Society 2001).

Centromadia pungens ssp. laevis belongs to a group of species known as spikeweeds, which have recently undergone a nomenclature change. Under the current taxonomic treatment, smooth tarplant is recognized as *Centromadia pungens ssp. laevis* (Baldwin 1999). Smooth tarplant is one of four

subspecies of *Centromadia pungens* that occur in California (Keil 1993). Smooth tarplant has a more southern distribution than subspecies *maritima*, *pungens*, and *septentrionalis*.

Habitat Description

Centromadia pungens spp. *laevis* grows on seasonally mesic alkaline substrates in grasslands or sites with minimal shrub cover, often in association with other alkali-tolerant species (Reiser 1994).

Occurrence Status

The California Natural Diversity Database (CNDDB) reports 61 occurrences for *Centromadia pungens* spp. *laevis* (California Department of Fish and Game 2002), seven of which are old needing confirmation of population status. The majority of these occurrences are on private lands, with three reported for State owned lands. Population numbers vary greatly from 4 to over 10,000 plants per site with the majority of the occurrences containing over 1000 plants.

There are no known occurrences of *Centromadia pungens* spp. *laevis* on National Forest System lands. One occurrence is mapped along the Indian Truck Trail, although the exact location or proximity to the Cleveland National Forest is unknown.

Threats

The CNDDB reports 61 occurrences with some occurrences having large population sizes. However, *Centromadia pungens* spp. *laevis* is considered to be in danger of extinction throughout its range (California Native Plant Society 2001, Reiser 1994). It nearly extirpated in San Diego County and appears to be severely declining in western Riverside County (Reiser 1994). Threats to these populations include road maintenance and agricultural development.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Centromadia pungens* spp. *laevis*:

- Survey areas around the Indian Truck Trail in appropriate habitat.
- Implement actions in the conservation strategy for coastal sage scrub which includes this taxon to the greatest extent practicable (USDA Forest Service et al. 1997).

Evaluation of Current Situation and Threats on National Forest System Lands

There are no documented occurrences of *Centromadia pungens* spp. *laevis* on National Forest System lands. Potential habitat along Indian Truck Trail should be surveyed to determine whether the species

does occur on the Cleveland National Forest.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Centromadia pungens* spp. *laevis* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Centromadia pungens* spp. *laevis*.

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Ceanothus ophiochilus

Chaenactis parishii

Chaenactis parishii

Chaenactis parishii A. Gray (Parish's chaenactis)

Management Status

Federal: None (historically on sensitive list)

California: None

Heritage Rank: G3, S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-2

General Distribution

Chaenactis parishii, Parish's chaenactis, occurs in the Peninsular Ranges of Riverside and San Diego counties and Baja California, Mexico (California Native Plant Society 2001, Morefield 1993). There are historic occurrences in the Cuyamaca Mountains on Stonewall and Cuyamaca peaks (Reiser 1994).

Distribution in the Planning Area

Occurrences are known on the San Bernardino and Cleveland National Forests (CalFlora 2000). Some of the best-protected sites are in the Santa Rosa Wilderness Area in the Santa Rosa Mountains. Other occurrences are known in the San Jacinto Mountains and in the Garnet Peak area of the Laguna Mountains (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Chaenactis parishii is a sub-shrub with erect branches of 20-60 cm. Leaves are < 6 cm, finely tomentose, not fleshy, with 0 to withering basal rosette. Leaves are also lobed in 2-5 pairs. Inflorescence heads are 1 to few, with white to pinkish, all radial flowers (Morefield 1993). Plants flower from May to June (California Native Plant Society 2001). This is the only perennial *Chaenactis* species occurring in the Peninsular Ranges (Morefield 1993). The growth of this plant appears to be governed by summer rainfall, which tends to be rare in the Peninsular Ranges (Reiser 1994). It is also known to respond positively to disturbance and has appeared along the sides of roads (Stephenson and Calcarone 1999).

Habitat Description

Chaenactis parishii grows in dry, rocky openings in low-growing chaparral at elevations of 4,250-8,200 feet (1,200-2,500 meters), where there is limited competition from other plants (Reiser 1994, California Native Plant Society 2001). It tends to occur on high mountain ridges overlooking the desert.

Occurrence Status

Occurrences of *Chaenactis parishii* are known from the San Bernardino and Cleveland National Forests (CalFlora 2000). Some of the best-protected sites are in the Santa Rosa Wilderness Area in the Santa Rosa Mountains. Other occurrences are known in the San Jacinto Mountains and in the Garnet Peak area of the Laguna Mountains (Stephenson and Calcarone 1999). Population numbers are not known.

OCCURRENCE DATA - *Chaenactis parishii* (Parish's chaenactis)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
U	2-1	U	1988	Garnet Peak / CNF	SD
U	2-2	U	1977	Garnet Peak / CNF	SD
U	2-3	U	1977	Garnet Peak / CNF	SD
U	2-4	U	1977	Garnet Peak / CNF	SD
U	2-5	U	1977	Monument Peak / CNF	SD
U	2-6	U	1977	Monument Peak / CNF	SD
U	*	U	?	La Posta / CNF	SD

- *U* = Unknown.
- * an occurrence number has not been assigned.
- CNF = Cleveland National Forest
- SD = San Diego County

Threats

Chaenactis parishii is distributed in a limited number of occurrences but is not currently considered to be at risk of extinction (California Native Plant Society 2001). Populations on National Forest Service lands appear stable (Stephenson and Calcarone 1999).

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Chaenactis parishii*.

- Survey areas Garnet Peak area after fire.
- Allow wildland fires to freely burn through populations. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. Use ridgelines or base of mountains for fuel break construction. The use of hand line for fuel break construction is preferred.

Evaluation of Current Situation and Threats on National Forest System Lands

The seven documented occurrences of *Chaenactis parishii* are currently stable on the Cleveland National Forest and are considered to have low vulnerability to local extirpation. Some of the best-protected sites are in the Santa Rosa Wilderness Area in the Santa Rosa Mountains. A portion of the Garnet Peak occurrences may have burned over during the Garnet Peak and Pines Fire in summer 2002. Surveys in the three postfire years should be conducted to evaluate post-fire regeneration. No threats to this species from Forest Service activities have been identified.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Chaenactis parishii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Chaenactis parishii* on National Forest System lands, no

alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Centromadia pungens ssp.
laevis**

**Chlorogalum pomeridianum
var. minus**

Chlorogalum pomeridianum var. minus

Chlorogalum pomeridianum (DC.) Kunth var. *minus* Hoover (Dwarf soaproot)

Management Status

Federal: Forest Service: None; Bureau of Land Management Sensitive

California: None

Heritage Rank: G5T1, S1.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Chlorogalum pomeridianum var. *minus* is known from widely scattered occurrences in the interior North Coast Ranges, the San Francisco Bay Area, and from a couple of disjunct occurrence in the outer South Coast Ranges of San Luis Obispo County (Jernstedt 1993).

Distribution in the Planning Area

Chlorogalum pomeridianum var. *minus* is reported to occur in the Los Padres National Forest on a ridge northwest of Cuesta Ridge (Hoover 1970), on Camp San Luis (Painter 2004), and near the Forest in an area 3 miles southeast of San Luis Obispo (California Natural Diversity Database 2004). It has also been reported by Munz from Alder Creek Road (Painter 2004).

Taxonomy and Natural History

Chlorogalum pomeridianum var. *minus* is a monocot in the lily family (Liliaceae). There are three varieties of *Chlorogalum pomeridianum*. *Chlorogalum pomeridianum* var. *minus* differs from the other varieties in that it is found on serpentine soils and the bulb coats are membranous or have few coarse fibers (Jernstedt 1993).

Chlorogalum pomeridianum var. *minus* is a bulbiferous perennial herb that blooms May–August (California Native Plant Society 2001).

Habitat Description

Chlorogalum pomeridianum var. *minus* grows on serpentine outcrops within chaparral (Jernstedt 1993).

Occurrence Status

Chlorogalum pomeridianum var. *minus* is distributed in limited number of occurrences in California and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). Population trends for this species are unknown, and vulnerability within National Forest System lands is thought to be low (Stephenson and Calcarone 1999, California Natural Diversity Database 2002).

Threats

Trampling from dispersed recreation and off road vehicle trespass are potential threats on Cuesta Ridge.

Threats and possible threats at Camp San Luis Obispo (Painter 2004) include erosion, cattle, feral pigs, road maintenance, non-native plants, military training activities, construction, too frequent fires, out of season fires, trampling, soil compaction, and dust.

Conservation and Management Considerations

More information is needed on the Los Padres National Forest occurrence of the *Chlorogalum pomeridianum* var. *minus*.

Evaluation of Current Situation and Threats on National Forest System Lands

Based upon the above analysis this species has been assigned the following threat category:

3. Common or widespread in plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Chlorogalum pomeridianum* var. *minus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Chlorogalum pomeridianum* var. *minus* on National Forest

System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Chaenactis parishii

**Chlorogalum purpureum var.
reductum**

Chlorogalum purpureum* var. *reductum

Chlorogalum purpureum Bdg. var. *reductum* Hoover (Camatta Canyon amole)

Management Status

Federal: Threatened (65 FR 14878-14888, 2000)

California: Rare

Heritage Rank: G1T1, S1.1 – very threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

Critical Habitat (CH) for *Chlorogalum purpureum* var. *reductum* was designated by the USFWS on October 24, 2002 (67FR 65413). In determining which areas to designate as CH the USFWS considers those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These features are termed Primary Constituent Elements (PCEs) and they are summarized in the final rule (68 FR 65413). Note: The map corrections published on April 24, 2003 (68 Federal Register 20083, U.S. Fish and Wildlife Service 2003) for *C. purpureum* var. *purpureum* had nothing to do with *C. purpureum* var. *reductum*.

General Distribution

Chlorogalum purpureum var. *reductum* is narrowly distributed on the northeast side of the La Panza Range in San Luis Obispo County. Plants occur in two discrete locations. The larger site is adjacent to State Highway 58, a two-lane road. A smaller site is occurs approximately 3 miles (4.8 kilometers) to the south (Stephenson and Calcarone 1999).

Distribution in the Planning Area

The larger of the two known occurrences occupies between 10 and 12 acres (4.0-4.9 hectares) of habitat on both private and National Forest System lands; Highway 58 bisects the occurrence. Several hundred thousand plants are estimated to occur at this location. North of the highway, the population occurs on private lands. The plants south of the highway are within the Santa Lucia Ranger District on the Los Padres National Forest. This population is patchily distributed over the plateau; it has been estimated to

occupy less than 8 acres south of the highway and a smaller area on the north side. Forest Service Road 29S15, a graded dirt road about 33 feet (10 meters) wide, bisects the portion of the population on public land.

The second known locality of *Chlorogalum purpureum* var. *reductum* was first documented by botanists in the mid-1990s. It is 3 miles (4.8 kilometers) south of the Los Padres National Forest population in an area with similar soils and topography. This occurrence has been estimated to occupy less than 0.25 acre (0.1 hectare) and consists of several hundred plants in two or more patches entirely on private land.

Taxonomy and Natural History

Chlorogalum purpureum var. *reductum* is a monocot in the Liliaceae (lily family). *Chlorogalum purpureum* var. *reductum* and the other variety of the species, purple amole (*C. p.* var. *purpureum*), are the only members of the genus with bluish-purple flowers that open during the day. Variety *purpureum* is found further north of *Chlorogalum purpureum* var. *reductum* on the east side of the Santa Lucia Mountains in Monterey County (Jernstedt 1993). Variety *reductum* appears to be identical to variety *purpureum* except for its compact, dwarf habitat of growth (Hoover 1964). When cultivated in San Luis Obispo, Hoover (1964) reported that both varieties retained their distinctive habit when grown side by side.

Reproduction of *Chlorogalum purpureum* var. *reductum* is primarily by seed. Each flower contains six ovules, although not all develop into seeds in the wild. The species is reported to be self-compatible, and insect pollination appears to result in increased seed set. Seeds are likely dispersed by gravity. The time from germination to first reproduction may be as long as 15 years (U.S. Fish and Wildlife Service 2001).

The Los Padres National Forest has been monitoring the population dynamics of this taxon by tracking the number and age class of plants in eleven 0.5-square-meter plots. The study began in 1991 and data were collected until 1997. Analysis of the data has not yet been completed, but preliminary findings suggest that the abundance of this taxon is relatively static, with some variation on an annual basis due to dormancy, mortality, and recruitment. Recruitment of seedlings appears generally to occur in years with above-average precipitation (U.S. Fish and Wildlife Service 2001).

Habitat Description

Chlorogalum purpureum var. *reductum* occurs in grassland, oak woodland, and oak savannah at elevations of 1,000-2,050 feet (305-625 meters) in the South Coast Ranges. Like other members of the lily family, *Chlorogalum purpureum* var. *reductum* probably develops root-hyphae relationships with a fungus. These mycorrhizal relationships can aid in nutrient and water uptake by the host plant and can alter growth and competitive interactions between species (U.S. Fish and Wildlife Service 2000).

At both known locations of *Chlorogalum purpureum* var. *reductum*, the plants grow in variously sized patches and are not uniformly distributed throughout the habitat, which is described as sparsely

vegetated annual grasslands surrounded by blue oak (*Quercus douglasii*) woodland and gray/foothill pines (*Pinus sabiniana*). Other native species found in the area include *Brodiaea coronaria*, *Clarkia purpurea*, *Crassula erecta*, *Dichelostemma capitatum*, and *Calycadenia villosa*, another sensitive species (USDA Forest Service 2000).

Chlorogalum purpureum var. *reductum* grows on well-drained red clay soils with substantial amounts of pebbles and gravels and a high (8:1) calcium:magnesium ratio (Lopez 1992). Despite reports to the contrary (Jernstedt, J. 2002), the substrate in this area is not serpentine (Lopez 1992). The taxon appears to be restricted to areas with rocky, nutrient-poor soils that tend to prevent herbivory by pocket gophers. In areas with better soils, nonnative annuals (e.g., *Bromus madritensis* ssp. *rubens*, *Erodium* spp., *Schismus barbatus*, *Avena barbata*) appear to be out competing *Chlorogalum purpureum* var. *reductum* for space, light, nutrients, and water (U.S. Fish and Wildlife Service 2000).

Occurrence Status

Chlorogalum purpureum var. *reductum* is known from only two occurrences (California Native Plant Society 2001). Population trends are fluctuating. The number of plants in the larger occurrence varied substantially (between 56 and 500,000 plants) based on observations between 1982 and 1991 (California Natural Diversity Database 2001).

Monitoring *Chlorogalum purpureum* var. *reductum* is complicated by the life history traits of this taxon. Because the bulbs can remain dormant for many years, monitoring efforts in any given year will only detect a portion of the population. Changes in the number of plants present from year to year may be due to differences in the proportion of bulbs that produce leaves and stems and may not reflect actual changes in the abundance of the population. Furthermore, attempts to map or tag the location of plants is complicated by the shrink/swell characteristics of the soil, which make it difficult to be certain that tagged or mapped plants can be accurately tracked over time (USDA Forest Service 2000).

A study on National Forest System lands (Koch 1997) is investigating the efficacy of establishing new individuals in areas that have been subject to soil compaction as opposed to areas that have not been subject to soil compaction. Two-year study results indicate that germination rates and survivorship of planted seeds is reduced in compacted soils. This suggests that the species' abundance in undisturbed areas has probably declined in comparison with areas where there has been off-highway vehicle (OHV) trespass. The extent of compacted soils has not been determined or estimated.

Monitoring along a 330-foot transect showed that plant numbers were relatively stable along the transect between 1991 and 1997 (U.S. Fish and Wildlife Service 2001). This transect is not located in an area where OHV trespass has continued to occur and is, therefore, not representative of the status of the population in areas subject to OHV activity. The portion of the population where the transect is located is accessible to livestock.

OCCURRENCE DATA – *Chlorogalum pupureum* var. *reductum* (Camatta Canyon amole)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	1000+ in '82, 56 in '87, 90 in '88, 500,000 in 1991	2002	ENTRANCE TO LOS PADRES NF, ALONG NAVAJO RD, BOTH SIDES OF HWY 58, 8.3 MI E OF JCT HWY 58 & HUERHUERO-LA PANZA RD. ALSO IN SECTION 20 AND 8. GRAZING EXCLOSURE LOCATED AT NAD27 747091E 3920622N (2003), T29S/R16E/S17	SLO

- SLO = San Luis Obispo

Threats

Forest Road 29S15, the graded dirt road that bisects the large population on public land, leads to private inholdings and residences within the Los Padres National Forest. This road is bounded on either side by a pipe barrier that was installed in about 1990 to prevent OHVs from using the site. A removable portion of the barrier and a barbed-wire section of fence have been routinely breached by OHVs. Such illegal use was noted to be increasing from 1995 through 1997 (U.S. Fish and Wildlife Service 2001). In 1998, after publication of the proposed rule to list the species (U.S. Fish and Wildlife Service 1998), the broken section of barbed wire fence was replaced with a single-post barrier, and sections of broken pipe barrier elsewhere were rewelded. Stephenson and Calcarone (1999) reported that despite being partially fenced, the area was still being used as an informal staging area for OHVs and cattle. However, monitoring of habitat in 2002, 2003, 2004, showed that the welded pipe barrier has proven to be an effective deterrent to unauthorized use of *C. purpureum* var. *reductum* habitat by OHV's. On average, only one trespass per year has been noted, and these events have resulted in only minor damage to plants and habitat. Monitoring of habitat from 2002- 2004 has also shown that livestock use of occupied habitat has either not occurred (2002) or in 2003- 2005 was very minimal (USDA Forest Service 2005).

Maintenance grading of Forest Road 29S15, which is about 33 feet (10 meters) wide, is directly affecting *Chlorogalum purpureum* var. *reductum*. In recent years, grading has increased the width of the road by about 5-10 feet (1.5-3.0 meters), resulting in the loss of additional plants and habitat. The road may indirectly affect *Chlorogalum purpureum* var. *reductum* habitat by altering local hydrologic function. Equipment used in the maintenance of this road can carry propagules of nonnative plants, potentially leading to the unintentional introduction of nonnative undesirable plant species. However, nonnative plants that are tolerant of the dry soils (e.g., *Bromus* sp. and *Erodium* sp.) are already present

on site and have been a part of the annual grassland flora for more than 100 years. Other nonnative plant species, such as *Centaurea solstitialis*, have not been able to persist on site, and the risk of introducing seed from other nonnative species is low (U.S. Fish and Wildlife Service 2001).

A few plants extend into the California Department of Transportation (Caltrans) right-of-way along the highway. Caltrans has designated both sides of the right-of-way in this area as Botanical Management Areas.

One cattle-grazing allotment overlaps the area occupied by the *Chlorogalum purpureum* var. *reductum*; livestock grazing occurs February-May. Livestock can trample and eat the aboveground portions of the plant and compact soils to the degree that plants may be unable to extend roots or stems or acquire water. The timing and extent of livestock use in the area where *Chlorogalum purpureum* var. *reductum* grows exerts substantial influence on the effects of grazing. The effects of livestock grazing on this taxon need further evaluation (U.S. Fish and Wildlife Service 2001).

Conservation and Management Considerations

Conservation measures that could be considered include minimization and avoidance measures for grazing, range improvement, fire control, and road and OHV management. Research on the effects of livestock grazing on *Chlorogalum purpureum* var. *reductum* should consider direct effects such as trampling, soil compaction, and herbivory, as well as indirect effects such as the potential reduction in the competition posed by nonnative annual grasses. This research may also need to explore the relationship between hoof impacts from livestock on cryptobiotic crusts and the germination and establishment of nonnative grasses.

Evaluation of Current Situation and Risks on National Forest System Lands

Chlorogalum purpureum var. *reductum* is a very narrow endemic and is affected by road use, road maintenance, grazing, off highway vehicle use, and dispersed recreation.

Based upon the above analysis *Chlorogalum purpureum* var. *reductum* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	A

Chlorogalum purpureum var. *reductum* is listed under the Endangered Species Act of 1973, as amended, as threatened, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

Habitat for *Chlorogalum purpureum* var. *reductum* has been fragmented by the construction of Red Hill Road through the midst of the occurrence and degraded, to a small extent, by livestock grazing and unauthorized off road travel. Impacts from off road travel may persist for years. The amount and quality of habitat has been stable and would remain stable under Alternatives 1, 2, 3, and 4. Alternative 4a would emphasize more controlled growth of recreation, including OHV use and potential OHV trespass onto potential habitat. Under Alternative 5, an increased emphasis on motor vehicle based recreation could lead to additional off road and off trail impacts to habitat for *Chlorogalum purpureum* var. *reductum*. Under Alternative 6, less emphasis on recreation, especially off highway vehicle recreation, and the potential for decreased grazing, would combine to allow for the restoration of lost and degraded habitat.

Although the amount of habitat for *Chlorogalum purpureum* var. *reductum* is very limited and some habitat has been lost as result of road construction and use, current activities and uses do not appear to be substantially degrading this habitat and no habitat is expected to be lost under any of the proposed alternatives.

In Alternatives 2-6, 31 acres of occupied habitat of *Chlorogalum purpureum* var. *reductum* found on either side of Red Hill Road would be located in the recommended Camatta Botanical Special Interest Area (SIA) and this SIA designation would provide management direction for the protection of *Chlorogalum purpureum* var. *reductum* habitat. Fifty five acres of designated Critical Habitat would be protected under this recommended SIA in Alternatives 2-6. Under these alternatives, use of Standard S33 within the recommended SIA would add additional protection as new projects are proposed. Under Alternative 6, occupied *Chlorogalum purpureum* var. *reductum* habitat along either side of Red Hill Road would be within a Critical Biological land use zone and this designation would ensure that *Chlorogalum purpureum* var. *reductum* habitat would receive an even higher level of protection.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
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C	C	C	C	C	C	B
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Although habitat not on National Forest System land (i.e., land managed by CalTrans along Highway 58 and by private landowners to the north and south of occupied habitat on NFS land) is degraded, plants continue to persist at all three locations and have the potential for continued persistence unless current land use practices change substantially.

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Chlorogalum pomeridianum
var. minus

Chorizanthe blakleyi

Chorizanthe blakleyi

Chorizanthe blakleyi **Hardham** (Blakley's spineflower)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Chorizanthe blakleyi is endemic to the north slope of the Sierra Madre Mountains in Santa Barbara County and is found at about eight locations. Reports that *Chorizanthe blakleyi* is present in Bear, Castro, Goode, and Tennison canyons are in error; the plants at these locations are *Chorizanthe uniaristata* (Foster 2003a; Smith, personal communication).

Distribution in the Planning Area

Chorizanthe blakleyi is found on the Los Padres National Forest at the following locations: White Oaks Guard Station; Aliso Canyon; above Montgomery Potrero; and near McPherson Peak (Smith 1998, CalFlora 2002). The population that is one mile southeast of McPherson Peak is the type locality (Smith 1998).

Taxonomy and Natural History

Chorizanthe blakleyi is a dicot in the buckwheat family (Polygonaceae). It is closely related to *Chorizanthe palmeri*, from which it differs by the shape and color of the flowers (Hickman 1993). *Chorizanthe blakleyi* is an ascending annual, 5-15 cm tall. The stem is yellow-green and covered with long spreading hairs. The leaves are mostly basal, generally oblanceolate, and 5-25 mm long. The involucre is urn-shaped, and thinly hairy with six awns. The perianth is 5-6 mm, white to pink. Flowering occurs from April to June.

Habitat Description

Chorizanthe blakleyi occurs on flats and north-facing slopes in sandy, sometimes rocky, open areas in chaparral or pinyon-juniper woodland.

Occurrence Status

Chorizanthe blakleyi is reported to be locally abundant in years with suitable rainfall (Smith 1998) and absent in years of low rainfall. In Aliso Canyon, over 150 plants were observed in 1995, and in 2003 there were 104 plants (Foster 2003b). There is no trend data for the population at McPherson Peak, but in 2003 there were over 700 plants present (Foster 2003c). In Bates Canyon adjacent to the White Oaks Guard Station, there were 238 plants in 1995 and about 250 plants in 2003 (Foster 2003d).

Threats

Chorizanthe blakleyi is threatened by vehicles, dispersed recreation, road maintenance, and nonnative undesirable plants (California Native Plant Society 2001). On National Forest System (NFS) lands, the primary threat is from road and trail maintenance. Grazing occurs in three of the four locations where *Chorizanthe blakleyi* is found but to date, impacts from grazing have not been noted. The low growing, prickly stature of *Chorizanthe blakleyi* probably reduces the risk of herbivory but trailing by livestock could impact *Chorizanthe blakleyi* habitat and plants could be adversely affected if trampling occurs during the growing season.

Conservation and Management Considerations

Coordinate road and trail maintenance to avoid impacting *Chorizanthe blakleyi* plants and habitat on National Forest System lands in Aliso Canyon and along Sierra Madre Ridge Road near McPherson Peak.

Survey Rocky Ridge Trail north of Montgomery Potrero in order to locate this historic occurrence. If found, use GPS technology to accurately record location of plants. Complete occurrence record and evaluate current threats.

Coordinate with fire and facilities managers to ensure that any use or decommissioning of the water tank at White Oaks Station is accomplished with minimal risk to *Chorizanthe blakleyi*.

Evaluation of Current Situation and Threats on National Forest System Lands

Chorizanthe blakleyi is an uncommon, narrow endemic, with only four occurrences known on NFS land. Each of these occurrences is found adjacent to a road, a trail, or a water tank, making each occurrence vulnerable to use of NFS land.

Based upon the above analysis *Chorizanthe blakleyi* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Chorizanth blakleyi is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Existing roads, trails and facilities have resulted in past impacts to *Chorizanth blakleyi* and the creation of small gaps in the species historic distribution. Populations appear stable and are likely to remain stable under all alternatives but Alternative 5. The increased emphasis on motor vehicle based recreation in Alternative 5 could result in higher levels of dispersed recreation use, increased instances of unauthorized off road travel, and higher levels of road and trailside disturbance. This could lead to increased fragmentation of *Chorizanth blakleyi* habitat and smaller population sizes. However, if current road closures remained in effect on those road segments where *Chorizanth blakleyi* occurs (Sierra Madre Ridge Road and Aliso Canyon Road) then there would be no difference between alternatives.

Viability outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Little information is available regarding the status of *Chorizanth blakleyi* on private land. Available information indicates that habitat has been fragmented by oil development in the Cuyama Valley foothills, and by road and rangeland improvements. Intensive grazing by livestock may also adversely

affect habitat on private property. The degree of habitat fragmentation that is present across the entire range of the species would not be substantially affected by any of the alternatives; the increase in habitat fragmentation that would occur under Alternative 5 would not be sufficient to produce a high probability that occurrences would become extirpated.

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**Chlorogalum purpureum var.
reductum**

Chorizanthe breweri

Chorizanthe breweri

Chorizanthe breweri S. Watson (Brewer's spineflower)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2, S2.2 – (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Chorizanthe breweri is endemic to the outer South Coast Ranges in southwestern San Luis Obispo County (Hickman 1993) with numerous collections reported from Camp San Luis Obispo (Painter 2004). This species has also been reported from San Carpoforo Creek in northern San Luis Obispo County (UC Berkeley 2004, Painter 2004).

Distribution in the Planning Area

Chorizanthe breweri is found on the Santa Lucia Ranger District of the Los Padres National Forest from Cerro Alto and Cuesta Ridge to Lopez Mountain (Stephenson and Calcarone 1999). Five of the 21-recorded occurrences are located on National Forest System lands (California Natural Diversity Database 2004).

Taxonomy and Natural History

Chorizanthe breweri is a dicot in the buckwheat family (Polygonaceae).

Chorizanthe breweri is an annual herb that blooms May-August (California Native Plant Society 2001).

Habitat Description

Chorizanthe breweri grows on serpentine soils in chaparral, coastal scrub, foothill woodland, and

Sargent cypress forest (Hickman 1993, California Native Plant Society 2001).

Occurrence Status

Chorizanthe breweri is distributed in several highly restricted occurrences but is currently not considered to be at risk of extinction (California Native Plant Society 2001). One known location on private land is threatened by development and several occurrences on private land are used for grazing. Several occurrences are on land managed by the City of San Luis Obispo and appear to be secure. One population of about 20 plants is located at Camp San Luis Obispo and is marginally threatened by military activities and cattle grazing.

Occurrences of *Chorizanthe breweri* on the Los Padres National Forest are fairly large and mostly free from disturbance and habitat quality is stable or increasing. One occurrence of over a thousand plants near the TV towers on Cuesta Ridge is impacted by dispersed recreation use and unauthorized OHV use. *Chorizanthe breweri* was surveyed on Cuesta Ridge Botanical Area after Hwy 41 fire (Painter per. Comm. 2004)

The total number of plants roughly estimated to occur in the 21 occurrences of *Chorizanthe breweri* is about 10,000.

Threats

Potential threats on National Forest System lands include road use and maintenance and off-highway vehicles (California Native Plant Society 2001, California Natural Diversity Database 2004). Additional threats and possible threats at Camp San Luis Obispo include grazing, nonnative plants, erosion from mines and tailings, and trampling (Painter 2004)

Conservation and Management Considerations

At least three of the five occurrences of *Chorizanthe breweri* that are found on National Forest System lands are located in areas with no current land use. One occurrence near the TV towers on Cuesta Ridge would benefit from less trampling from human foot and vehicular traffic.

Evaluation of Current Situation and Threats on National Forest System Lands

Chorizanthe breweri is a narrow endemic restricted to serpentine soils near the town of San Luis Obispo but within this narrow range the species is relatively common and there are no apparent downward trends in habitat suitability except for one location where dispersed recreation use is high.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Chorizanthe breweri is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Chorizanthe breweri* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Chorizanthe breweri* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Chorizanthe blakleyi

**Chorizanthe parryi var.
fernandina**

Chorizanthe parryi var. fernandina

Chorizanthe parryi S. Watson var. *fernandina* (S. Watson) Jeps. (San Fernando Valley spineflower)

Management Status

Federal: Fish and Wildlife Service Candidate, Forest Service Sensitive

California: Endangered

Heritage Rank: G2T1, S1.1 – (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Chorizanthe parryi var. *fernandina* was endemic to the Los Angeles Basin and neighboring valleys and mesas. Most of its former range in Los Angeles and Orange counties has been subject to intensive urban development and the plant is now known from only two locations, one in the southeastern portion of Ventura County and one in southwestern Los Angeles County (Fish and Wildlife Service 2002).

Chorizanthe parryi var. *fernandina* is believed to be extirpated from Orange County (California Native Plant Society 2001).

Distribution in the Planning Area

Chorizanthe parryi var. *fernandina* is not known to occur on National Forest System lands. There are historical accounts of *Chorizanthe parryi* var. *fernandina* being found near the Angeles and Los Padres National Forests at the following locations: Santa Susana Mountains/Newhall Ranch, Elizabeth Lake, near Castaic, and Little Tujunga Wash (CalFlora 2002, California Native Plant Society 2003, California Natural Diversity Database 2004).

Taxonomy and Natural History

Chorizanthe parryi var. *fernandina* is a dicot in the buckwheat family (Polygonaceae). It is closely related to *Chorizanthe parryi* var. *parryi*, from which it differs by having involucre awns that are straight versus hooked in *Chorizanthe parryi* var. *parryi* (Hickman 1993). *Chorizanthe parryi* var. *fernandina* is a prostrate to spreading annual to 30 cm wide. The stem is covered with hairs that are stiff and straight. The leaves are mostly basal, generally oblanceolate, and 5-40 mm long. The involucre is

urn-shaped, and thickly covered with hair. The six awns are straight. The perianth lobes are more-or-less equal, is 2.5-3 mm long, white in color and sparsely hairy. Flowering occurs from April to June (Reveal 2001).

Habitat Description

Chorizanthe parryi var. *fernadina* occurs on sandy soils in flats and foothills in mixed grassland and chaparral communities (Reveal 2001). The California Native Plant Society (2001) describes the habitat as coastal scrub with an elevation range of 150 to 1220 meters. Drill (2001) described the habitat as sandy or gravelly soils in dry washes in coastal sage scrub and alluvial fan scrub.

Occurrence Status

Chorizanthe parryi var. *fernadina* is reported from only two locations. At one of the locations the plant is locally abundant with 14 subpopulations, though much of this habitat is planned for development. The second known location consists of a single occurrence and this habitat, too, is planned for development.

Threats

Chorizanthe parryi var. *fernadina* is threatened by urban development on private land (California Native Plant Society 2001, Fish and Wildlife Service 2002). There are no identified threats to plants or habitat National Forest System lands.

Conservation and Management Considerations

When conducting surveys in coastal scrub and alluvial scrub habitats at elevations below 4,000 feet on the portions of the Angeles and Los Padres National Forests that are adjacent to the Los Angeles Basin or the Santa Clara River watershed, design the survey protocol to enable the detection of *Chorizanthe parryi* var. *fernadina*.

Evaluation of Current Situation and Threats on National Forest System Lands

Chorizanthe parryi var. *fernadina* is not known to occur on National Forest System lands. Surveys of historic habitat near Lake Elizabeth have been negative (Boyd 2001).

Based upon the above analysis *Chorizanthe parryi* var. *fernadina* has been assigned the following threat category:

1. Not in the plan area.

Viability Outcomes

Chorizanthe parryi var. *fernardina* is a federal candidate, which assures that any consultation at the programmatic level will include this taxon. In the Biological Assessment for the Forest Plan Revision (a programmatic consultation), the USFS received confirmation from the USFWS that there would be "no effect" to this taxon. This was tracked in the Biological Assessment and the planning record (USDA Forest Service 2005). In site-specific projects, this taxon is treated as a Region 5 Sensitive species which assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

No populations of *Chorizanthe parryi* var. *fernardina* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Chorizanthe parryi* var. *fernardina*.

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Chorizanthe breweri	Chorizanthe parryi var. parryi
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Chorizanthe parryi var. parryi

Chorizanthe parryi S. Watson var. *parryi* (Parry's spineflower)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2T2; S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 3; R-E-D Code ?-2-3

General Distribution

Chorizanthe parryi var. *parryi* occurs on alluvial fans and terraces in San Bernardino, Riverside, Los Angeles, and Orange counties. Occurrence locations include the Santa Ana River Wash, Mill Creek, San Gorgonio Pass, Arroyo Seco in the San Gabriel Mountains, Devil Canyon, Cajon Wash, Millard Canyon, Wildwood Canyon, and the vicinities of Colton, Winchester, and Murrieta (California Natural Diversity Database 2004).

Distribution in the Planning Area

There are no confirmed occurrences of *Chorizanthe parryi* var. *parryi* on Forest System lands (California Natural Diversity Database 2004). However, there are several historical records for which there is vague location information, and it is possible that some of these occurrences are on or near Forest System lands. Occurrences near Arrowhead Hot Springs, at the mouth of Mill Creek, and at the mouth of Devil Canyon are close to the boundary of the San Bernardino National Forest (SBNF), and suitable habitat exists in the southern and southeastern portion of the San Bernardino and San Gabriel Mountains (USDA Forest Service 2002). Occurrences along the east base of the Santa Ana Mountains in Riverside County suggest that this species may also occur in suitable habitat on the CNF Trabuco District.

Taxonomy and Natural History

Chorizanthe parryi var. *parryi* is a dicotyledonous annual herb in the buckwheat family

(*Polygonaceae*). Stems of this plant may be prostrate to ascending, strigose, and generally 2-30 cm long. Leaf blades are 5-40 mm in length and oblanceolate to oblong in shape. The involucre tube is 1.5-2 mm long, urn-shaped, and canescent. The involucre also has 6 bracts and hooked awns. Perianth lobes are unequal, generally nearly entire, white, sparsely hairy and 2.5-3 mm long. There are 9 stamens (Hickman 1993). Flowering typically occurs between April and June (Munz 1974).

Habitat Description

Chorizanthe parryi var. *parryi* occurs in valley-floor and foothill habitats between 100 and 3,700 feet in elevation, and occasionally up to 5,600 feet (Hickman 1993). The plant is found in dry, sandy or gravelly soils in washes, alluvial benches, and in foothill microhabitats with unconsolidated soils and low vegetation cover. *Chorizanthe parryi* var. *parryi* most commonly occurs in openings in coastal sage scrub, chaparral, alluvial fan scrub, and the ecotone between chaparral and oak woodland. Species that are frequently associated with *Chorizanthe parryi* var. *parryi* are *Artemisia californica*, *Eriogonum fasciculatum*, *Pectocarya* sp., and *Encelia farinosa*. The Federally Endangered species, *Dodecahema leptoceras*, has also been recorded in proximity to occurrences of *Chorizanthe parryi* var. *parryi* in the Santa Ana River Wash (California Natural Diversity Database 2004).

Suitable habitat exists in the southern and southeastern portion of the San Bernardino Mountains area of the SBNF at low elevations. Suitable habitat on Forest System lands is threatened by flood regime alteration and unauthorized recreational uses, including vehicle use off of designated roads.

Occurrence Status

There are 40 records for *Chorizanthe parryi* var. *parryi* in the California Natural Diversity Database (2004). Although landowner information is unknown for several occurrences, at least eight are privately owned (non-Forest). Trends in abundance and distribution for *Chorizanthe parryi* var. *parryi* are unknown. However, many of the historical occurrences in California Natural Diversity Database were originally found within or near currently developed metropolitan areas, and it is likely that abundance and distribution of this plant is negatively correlated with residential and commercial development in all counties in which it occurs.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Chorizanthe parryi* var. *parryi* (Parry's spineflower)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1	U	1988	East of Cajon Creek, south of Junction of I-15 and I-15E, Devore. U – behind CDF Fire Station.	SBD
4	U	1980	Along Whitewater River, 3.2 mi N of Whitewater Post Office and Interstate 10. U	RIV
7	U	1932, 1921	Thompson Creek Dam, near Claremont. Needs fieldwork. U	LA
9	U	1902	Mt. Lowe, north of Pasadena. U	LA
15	U	1898	Mouth of Mill Creek Canyon, Mentone. U	SBD
16	1,000	1992	Mill Creek Wash, just downstream from mouth of canyon and 0.5 mile west of Ranger Station, Mentone. PVT-Southern California Edison (SCE)	SBD
17	100	1992	Wildwood Canyon at mouth of Water Canyon, Yucaipa. Needs fieldwork. U	SBD
18	U	1988	Alluvial fan at mouth of Devil Canyon, southwest of Benchmark 1750, north of San Bernardino. Needs fieldwork. U	SBD
19	500	1992	Water Canyon north of Wildwood Canyon. Ridgetop south of old Hubner House. U	SBD

24	1	1994	Millard Canyon, near confluence with west branch, about 1 mile upstream from canyon mouth, north of Cabazon. PVT	RIV
26	U	1892	Near Elsinore. U	OR, RIV
30	6 colonies	1991	Santa Ana Wash, about 0.9 mile south of Greenspot Road and 3 miles east of Orange Street, east Highlands. U	SBD
31	2 colonies	1991	Santa Ana Wash, about 1.0 mile south of Greenspot Road and 2.5 miles east of Orange Street, east Highlands. U	SBD
32	17 colonies	1991	Santa Ana Wash, about 0.4-1.0 mile south of Greenspot Road and 2 miles east of Orange Street, east Highlands. U	SBD
33	1 colony	1991	Santa Ana Wash, about 1.0 mile south of Greenspot Road and 1.3 miles east of Orange Street, east Highlands. U	SBD
34	1 colony	1991	Santa Ana Wash, about 0.3 mile south of Greenspot Road and 1 mile east of Orange Street, East Highlands. U	SBD
35	21-5,900	1994	Cajon Wash near confluence with Lytle Creek, about 1.5-2 miles upstream from Highland Ave, west of Muscoy. PVT	SBD

36	1,000+	1994	Cajon Wash, about 0.45 mile SSE of Kendall Ave. at junction with Cajon Blvd, east of Glen Helen Regional Park. PVT	SBD
37	U	1920	Arroyo Seco, San Gabriel Mountains northeast of La Canada Flintridge. U	LA
40	U	1999	Lytle Creek Wash, 3 air miles SSW of Devore, southeast of I-15, northwest of Rialto. PVT	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *OR = Orange County*
- *LA = Los Angeles County*
- *RIV = Riverside County*

Threats

On National Forest System lands, there are no known occurrences of *Chorizanthe parryi* var. *parryi*, and threats from Forest uses are unknown. Occurrences on private land are threatened by vehicular use, proposed development, altered flood regime, and sand and gravel mining operations.

Conservation and Management Considerations

The primary short-term conservation strategy for this species is to perform focused surveys within the relatively small amount of alluvial fan scrub on the NFS lands to determine whether suitable habitat occupied. Of equal importance is to manage NFS land watersheds in a manner consistent with the conservation of this species. The following is a prioritized list of conservation practices that should be considered for *Chorizanthe parryi* var. *parryi*:

- Perform focused surveys of all Alluvial Fan Scrub on the SBNF, ANF, and CNF for this species and associated rare plants.
- Avoid and minimize any activities on the SBNF that will adversely affect downstream habitat for *Chorizanthe parryi* var. *parryi*.
- Survey all new occurrences of *Chorizanthe parryi* var. *parryi* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.

- Collect a herbarium voucher specimen of *Chorizanthe parryi* var. *parryi* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Chorizanthe parryi* var. *parryi* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Chorizanthe parryi var. *parryi* is a narrow endemic endangered species that occurs only in washes and alluvial terraces downstream from the San Bernardino, San Gabriel, and Santa Ana Mountains, with suitable habitat but no known occupied habitat on NFS lands. It is threatened by any activities that can alter hydrology or fluvial geomorphology. Because watershed management can have profound effects on downstream hydrology and fluvial morphology, this species has the potential to be affected by activities associated with Forest Service management.

Based on this analysis, *Chorizanthe parryi* var. *parryi* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

Chorizanthe parryi var. *parryi* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

No populations of *Chorizanthe parryi* var. *parryi* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Chorizanthe parryi* var. *parryi*.

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**Chorizanthe parryi var.
fernandina**

**Chorizanthe polygonoides var.
longispina**

Chorizanthe polygonoides var. longispina

Chorizanthe polygonoides T. & G. var. *longispina* (Goodman) Munz (Long-spined spineflower)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T3, S1.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-2

General Distribution

Chorizanthe polygonoides var. *longispina*, long-spined spineflower, occurs in the Peninsular Ranges of Riverside and San Diego Counties and in Baja California (California Native Plant Society 2001, Hickman 1993). Disjunct populations in the Santa Ynez Mountains of Santa Barbara County have been reported (CalFlora 2000) but need verification. The California Natural Diversity Database lists 36 occurrences, some of which are entered in the table below, many from Lake Matthews in Riverside County (California Natural Diversity Database 2004). Reiser (1994) described 11 locations in San Diego and Riverside counties.

Distribution in the Planning Area

Within the Southern California National Forest System lands, *Chorizanthe polygonoides* var. *longispina* is known from the Cleveland National Forest (CNF) and the San Bernardino National Forest (California Natural Diversity Database 2004). Within the Cleveland National Forest the majority of the occurrences are located in the San Mateo Canyon Wilderness Area, but some are in the Agua Tibia Wilderness Area, and two occurrences are near Barber Mountain in southern Descanso Ranger District (California Natural Diversity Database 2004, CNF records). Several occurrences are present within an active grazing allotment on the San Bernardino National Forest (Stephenson and Calcarone 1999; Lardner pers. comm.).

Taxonomy and Natural History

Chorizanthe polygonoides var. *longispina* is small, prostrate, annual herb. Plants are generally reddish

with soft hairs. Leaves are 3-10 mm and thinly hairy. The involucre (including awns) is 3-4 mm, tube 1.5-2 mm (Hickman 1993). Flowers are small and inconspicuous, white to rose in color and blooming from April to July (California Native Plant Society 2001).

Habitat Description

Chorizanthe polygonoides var. *longispina* is associated with heavy, often rocky, clay soils of gabbro-derivation in open areas of needlegrass grasslands, coastal scrub and chaparral habitats, but it has also been found at the edges of vernal pools in grasslands and meadows (Reiser 1994). It is also associated with mountain meadows in sandy loam soil (USDA Forest Service 1998). It occurs at elevations of 100–4,760 feet (30–1,450 meters) (California Native Plant Society 2001). Associated species include *Nassella* sp., *Avena* sp., *Microseris douglasii* ssp. *platycephala*, *Artemisia californica*, *Allium munzii*, *A. haematochiton*, *Harpagonella palmeri*, *Chorizanthe procumbens* and *Convolvulus simulans* (USDA Forest Service 1998). In addition, on the San Bernardino National Forest *Chorizanthe polygonoides* var. *longispina* is associated with *Arabis johnstonii* and with *Allium munzii* in Riverside County (Larder pers. comm.).

Occurrence Status

The California Natural Diversity Database (CNDDDB) lists 42 occurrences for *Chorizanthe polygonoides* var. *longispina* (California Natural Diversity Database 2004). Twenty-five (60%) of these occurrences are on private lands. However, 10 of the privately owned occurrences are on a biological preserve surrounding Lake Mathews and 8 of these occurrences are old records needing current confirmation of population status (California Natural Diversity Database 2004). The Cleveland National Forest has 14 occurrences and the San Bernardino National Forest has several occurrences. The CNDDDB occurrence number 41 may not actually be on the Cleveland National Forest. Additional fieldwork is needed to verify this location.

OCCURRENCE DATA of *Chorizanthe polygonoides* var. *longispina* (Long spined spineflower) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
*	2-1	12	2001	Barber Mountain / CNF	RIV
1	*	U	1991	Barber Mountain / CNF	RIV
10	*	50-	1992	Miller Mountain / CNF	RIV

11	*	50-	1992	Miller Mountain / CNF	RIV
14	*	50-	1992	San Mateo Wilderness / CNF	RIV
15	*	50-	1992	San Mateo Wilderness / CNF	RIV
31	*	U	U	San Mateo Wilderness / CNF	RIV
32	*	10,000+	1995	Dorland Mountain (Agua Tibia Mountain) / CNF	RIV
33	*	1,000+	1995	Agua Tibia Mountain / CNF	RIV
34	*	100-	1995	Agua Tibia Mountain / CNF	RIV
35	*	100+	1995	Agua Tibia Wilderness / CNF	RIV
37	*	12	2001	Barber Mountain / CNF	RIV
40	*	U	1987	Dripping Spring Campground / CNF	RIV
41	*	1,000+	U	E. Meadowlark Lane / CNF??	RIV

- U = Unknown.
- * = an occurrence number has not been assigned.
- CNF = Cleveland National Forest
- RIV = Riverside County

Threats

Threats to *Chorizanthe polygonoides* var. *longispina* on non-preserve private lands include grazing,

recreation use, and development. Occurrences on the San Bernardino National Forest are in grazing allotments, but plants are located in the rocky, gravelly, areas, upland from meadows where grazing typically occurs. On the Cleveland National Forest occurrences at Barber Mountain are potentially threatened by off-highway vehicle use and non-native plant invasion. Populations at Miller Mountain are subjected to grazing; however, the effects of grazing to *Chorizanthe polygonoides* var. *longispina* are unknown. There are no threats to the occurrences within the San Mateo and Agua Tibia Wilderness. The exact location of the occurrence near Dripping Springs Campground needs additional fieldwork to determine if the occurrence is near a trail, and it may possibly be affected by recreation use.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Chorizanthe polygonoides* var. *longispina*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Allow wildland fires to freely burn through populations.
- Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks and roads, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. The use of hand line for fuel break construction is preferred.
- Monitor effects of grazing at Miller Mountain (Tenaja Allotment). Possibly adjust the grazing period if negative effects are found.
- Monitor and deter unauthorized off-highway vehicle use at Barber Mountain.

Evaluation of Current Situation and Threats on National Forest System Lands

Occurrences of *Chorizanthe polygonoides* var. *longispina* on the National Forest System lands are considered to have low to moderate vulnerability to local extirpation. Occurrences on the San Bernardino National Forest are stable within the grazing allotment as these plants occur upland from the more typically grazed meadow. In addition, the majority of the Cleveland National Forest populations are within wilderness areas where plant populations are large and they receive few visitors. However, the occurrences at Barber Mountain are at risk of local extirpation due to the small population size and threats of crushing by unauthorized off highway vehicle use. Efforts to deter the unauthorized use could help conserve this taxon. Authorized Forest Service activities do not appear to pose a substantial threat to this plant.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Chorizanthe polygonoides var. *longispina* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Chorizanthe polygonoides* var. *longispina* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Chorizanthe polygonoides* var. *longispina* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Chorizanthe parryi var. parryi

Chorizanthe procumbens

Chorizanthe procumbens

Chorizanthe procumbens Nutt. (Prostrate spineflower)

Management Status

Federal: None

California: None

Heritage Rank: G3?, S3.1? (California Natural Diversity Database)

California Native Plant Society (2001): considered but rejected, too common

General Distribution

Chorizanthe procumbens, prostrate spineflower, occurs in the southern Transverse Ranges and western Peninsular Ranges, along the central and southern South Coast Region from Ventura County south to San Diego County, and into Baja California (Hickman 1993).

Distribution in the Planning Area

Populations of *Chorizanthe procumbens* are known to occur on the Cleveland National Forest (CNF) at Barber and Viejas Mountains and in the Big Potrero area. It was also collected historically at Echo Mountain on the Angeles National Forest (CalFlora 2001); however, no recent documented occurrences of the species are known from that area. Potential habitat is present on the San Bernardino National Forest (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Chorizanthe procumbens is an annual herb that blooms April–June (California Native Plant Society 2001). Plants are prostrate about 2-25 cm, yellow-green in color with thin hairs. Leaves are 5-40 mm long. The involucre tube is 1.5-3 mm, cylindrical to narrowly bell-shaped, bracts 6 and generally spreading with recurved to hooked awns. The perianth is 1.7-3 mm long, white to yellow, hairy, entire with equal lobe lengths (Hickman 1993).

Chorizanthe procumbens is a dicot in the buckwheat family (Polygonaceae). *Chorizanthe procumbens*

encompasses several taxa that are no longer recognized. These taxa were previously distinguished from *Chorizanthe procumbens* by flower color, but the current circumscription of the species recognizes that flower color is highly variable among populations (Hickman 1993).

Habitat Description

Chorizanthe procumbens is common and occurs on gabbroic clay or granitic soils in coastal sage scrub, chaparral, pinyon-juniper woodlands, and grasslands at elevations below 2,500 feet (800 meters) (California Native Plant Society 2001, Hickman 1993). It appears to tolerate some types of ground disturbance, often growing along dirt roads and in lightly disturbed areas of chaparral and coastal sage scrub (Stephenson and Calcarone 1999).

Occurrence Status

There are no occurrence records for *Chorizanthe procumbens* in the California Natural Diversity Database (CNDDDB) (2002) or with the California Native Plant Society as it is considered too common to track (California Native Plant Society 2001). Four locations were record during 2001 surveys at Barber and Viejas Mountains and near the Big Potrero area in the Descanso Ranger District, Cleveland National Forest (CNF occurrence records, Virginia Moran surveys).

Threats

Much habitat for *Chorizanthe procumbens* has been lost through development and conversion of lands to invasive nonnative grasses (California Native Plant Society 2001). Habitat conversion resulting from invasion by nonnative grasses is a concern for many southern California ecosystems (Eliason and Allen 1997; D'Antonio and Vitousek 1992; Cione and others 2002). *Chorizanthe procumbens* was formerly considered at risk of extirpation in a portion of its range (California Native Plant Society 2001). However, it is now considered to be too common to be included in the California Native Plant Society inventory of rare and endangered plant species (California Native Plant Society 2001).

Conservation and Management Considerations

Management measures do not currently appear to be needed to maintain the viability of prostrate spineflower on National Forest System lands.

Evaluation of Current Situation and Threats on National Forest System Lands

Chorizanthe procumbens has very low vulnerability on National Forest System lands, as is it considered common. It appears to tolerate some types of ground disturbance, often growing along dirt roads and in lightly disturbed areas of chaparral and coastal sage scrub (Stephenson and Calcarone 1999).

Based upon the above analysis this species has been assigned the following threat category:

3. Common in Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Chorizanthe procumbens* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Chorizanthe procumbens* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Chorizanthe polygonoides var.
longispina**

Chorizanthe rectispina

Chorizanthe rectispina

Chorizanthe rectispina Goodman (Straight-awned spineflower)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G1, S1.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Chorizanthe rectispina is endemic to the Santa Lucia Ranges in southern Monterey, Santa Barbara, and San Luis Obispo Counties. It is known from less than 10 occurrences (CalFlora 2002, California Natural Diversity Database 2004).

Distribution in the Planning Area

Chorizanthe rectispina occurs on Black Mountain in the La Panza Range on the Los Padres National Forest (California Natural Diversity Database 2004). It occurs on an estimated 2.5 acres (1 hectare) (California Natural Diversity Database 2004). Three other occurrences are located on Bureau of Land Management lands near Santa Margarita.

Taxonomy and Natural History

Chorizanthe rectispina is a dicot in the buckwheat family (Polygonaceae).

Chorizanthe rectispina is a small annual herb with decumbent stems up to 10 inches (25 centimeters) long that flowers May–July (Hickman 1993, California Native Plant Society 2001).

Habitat Description

Chorizanthe rectispina grows in chaparral, cismontane woodland, and coastal scrub at elevations of 650–

3,400 feet (200–1,035 meters) (California Natural Diversity Database 2004). It is most often found in openings in chaparral growing on gravelly soils derived from granitic rock (California Natural Diversity Database 2004) and sometimes diatomaceous shale (Foster 1998).

Associates at Black Mountain include *Adenostoma fasciculatum* (Chamise), *Arctostaphylos glauca* (Big berry manzanita), and *Lotus scoparius*.

Occurrence Status

There is little population data available for the occurrence of *Chorizanthe rectispina* found at Black Mountain. A report from 1984 (California Natural Diversity Database 2004) indicates that there were between 101 and 1000 plants at this location (Occurrence #1) at the time of the survey. Clare Hardham indicated that *Chorizanthe rectispina* was not numerous at Black Mountain in 1955 and noted that the plants are difficult to locate (notes on file at Los Padres National Forest). Major wildfires have occurred in the Black Mountain area many times, including 1913, 1921, 1951, and 1995 (Hwy 58 Fire).

Threats

The Black Mountain occurrence on the Los Padres National Forest is near a radio facility and may be at risk from uses and maintenance activities (California Natural Diversity Database 2004) though surveys in 2004 did not detect any *Chorizanthe rectispina* in the area in and around the radio and radar facilities. At this time, *Chorizanthe rectispina* habitat is not affected by current land uses.

Some occurrences of *Chorizanthe rectispina* on private land may be at risk from increasing residential development and the disturbance-related spread of nonnative undesirable plants (California Natural Diversity Database 2004).

Conservation and Management Considerations

More information is needed on the size and distribution of the occurrence found at Black Mountain.

Evaluation of Current Situation and Threats on National Forest System Lands

Based upon the above analysis, *Chorizanthe rectispina* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Chorizanthe rectispina is a USDA Region 5 Forest Service Sensitive species. This assures that any new

project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Chorizanthe rectispina* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Chorizanthe rectispina* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Chorizanthe procumbens

**Chorizanthe xanti var.
leucotheca**

Chorizanthe xanti var. leucotheca

Chorizanthe xanti S. Watson var. *leucotheca* Goodman (White-bracted spineflower)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G4T3; S1S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Chorizanthe xanti var. *leucotheca* is endemic to the washes and outwash plains on the desert bases of the San Bernardino, San Jacinto and Santa Rosa Mountains (Hickman 1993).

Distribution in the Planning Area

Chorizanthe xanti var. *leucotheca* is known from one occurrence on the San Bernardino National Forest (Pinyon Flats / upper near the Santa Rosa Wilderness), and the rest of the occurrences are in downstream alluvial habitats. The occurrences are widely scattered in the eastern San Gabriel, San Bernardino, San Jacinto, and Santa Rosa Mountains; however, site-specific information is sparse (USDA Forest Service 2003). *Chorizanthe xanti* var. *leucotheca* has been observed at Whitewater Canyon, Millard Canyon, and Pinyon Flats (Sanders pers. comm.).

Taxonomy and Natural History

Chorizanthe xanti var. *leucotheca* is a dicotyledon in the buckwheat family (Polygonaceae). This annual herb blooms between April–June (California Native Plant Society 2001). There are two varieties of *Chorizanthe xanti*: var. *leucotheca* has a densely white-hairy involucre, whereas var. *xanti* has a thinly hairy involucre (Hickman 1993). The two varieties occur in similar habitats.

Chorizanthe xanti has stems that are more or less erect, 3-30 cm, reddish, and thinly hairy. The leaf blades are 3-15 mm, oblong to ovate, thinly hairy above, and densely tomentose below. The lower inflorescence bracts are more or less oblanceolate, leaf-like, persistent, and have straight awns. The

involucres are more or less loosely clustered, the tube is 3.5-5 mm, cylindrical, smooth, with slender, curly hairs, 6 bracts, and hooked awns. The perianth is 4.5-6 mm, rose to red, hairy, and has unequal lobes that are generally entire. There are 9 stamens. *Chorizanthe xanti* var. *leucotheca* is distinguished by its densely white-hairy involucre (Hickman 1993).

Habitat Description

Chorizanthe xanti var. *leucotheca* is found in sandy to gravelly places (Reveal 2001) in desert scrub communities, including Mojavean Desert scrub and pinyon-juniper woodlands, at elevations of 980-3,900 feet (300-1,200 m) (California Native Plant Society 2001). It generally occurs on alluvial washes, terraces, and plains within these habitats.

Mojavean Desert scrub and pinyon-juniper woodland are widespread within the Province; however, the microhabitat required by *Chorizanthe xanti* var. *leucotheca* is much more narrowly restricted.

Occurrence Status

Population trends of *Chorizanthe xanti* var. *leucotheca* on National Forest System lands are unknown. In good rainfall years it can be locally abundant (USDA Forest Service 2003).

The following table shows the recorded occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Chorizanthe xanti* var. *leucotheca* (White-bracted spineflower)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
*	at least 50	1994	Millard Canyon, southeastern San Bernardino Mountains. Open patches in <i>Lepidospartum</i> -dominated alluvial scrub habitat. Growing with numerous herbs including <i>Lotus strigosus</i> , <i>Eriophyllum wallacei</i> , <i>Filago calif.</i> , etc. <i>Chorizanthe parryi</i> var. <i>parryi</i> also present. Site appears to be secure for now. Suitable habitat is abundant in the wash. Probably many more individuals. PVT.	SBD

*	U	1891	Cabazon, collected in April (Orcutt/UC/Jeps)	RIV
*	U	1903	Whitewater, collected in May (Jones/UC/Jeps)	RIV
*	U	1978	Pinyon Flats area, above the dolomite mine. Pinyon woodland. Lat 33deg. 34.4',N; long 116 deg, 26.5', collected April 30, at 4,000 feet. Santa Rosa Mts. (Sanders/UCR). SBNF	RIV
*	U	1941	Head of Morongo Creek, Morongo Valley, at 2600 ft. Collected June 1, (Alexander/RSA)	SBD
*	U	1944	Devil's Garden, near Whitewater, elev. 1500 ft. Collected May 6, (Cooper/RSA)	RIV
*	U	1933	Dry Morongo, California desert (Dunkle/RSA)	SBD
*	U	1933	San Gorgonio wash, collected June 24. (Epling/RSA)	RIV
*	U	1926	Mission Creek wash, collected April 15. (Jaeger/RSA)	RIV
*	U	1930	1 mile E of Cabazon, San Gorgonio Pass, collected May 1. (Munz/RSA)	RIV
*	U	1937	Palms to Pines Hwy, N slope of Santa Rosa Mts., alt. 3500, collected May 29. (Munz/RSA)	RIV

*	U	1914	Whitewater, W end of Coachella Valley, collected in April. (Pierson/RSA)	RIV
*	U	1920	Lytle Creek, end of San Gabriel Mts. Collected May 18. (Pierson/RSA)	SBD
*	U	?	Cajon Wash (Krantz/UCR)	SBD
*	U	1980	San Bernardino Mts. Along Whitewater River, ca. 2 miles N of Whitewater P.O. and Hwy 10. Collected May 28. (Thorne/RSA)	RIV
*	U	1983	San Bernardino Mts. Sandy wash along Whitewater River where road crosses river below fish hatchery. Ca. 4 miles N of Whitewater P.O. elev. ca. 2100 ft. Collected April 29. (Thorne/RSA)	RIV
*	U	1932	1 mile below the fish hatchery, Snow Creek, N base of San Jacinto Mts. Alt 1300 ft, collected May 25. (Wolf/RSA)	RIV

- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *RIV = Riverside County*

Threats

Specific threats to *Chorizanthe xanti* var. *leucotheca* include unauthorized vehicle travel in wash habitat, roads where they cross washes, and the associated effects on fluvial geomorphology, and flood control projects. On private lands, development (residential, commercial, and golf courses), sand and gravel mining, and flood control threaten occurrences.

Conservation and Management Considerations

The primary short-term strategy for managing this species is to improve the knowledge of its distribution so that impacts can be identified and avoided/minimized. The following is a list of conservation practices that should be considered for *Chorizanthe xanti* var. *leucotheca*:

- Perform focused surveys of all suitable habitat on the SBNF for this species. In locations where other known rare plant and animal taxon occur, incorporate this taxon into surveys when they occur (SB kangaroo rat)
- Survey all new occurrences of *Chorizanthe xanti* var. *leucotheca* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Chorizanthe xanti* var. *leucotheca* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Chorizanthe xanti* var. *leucotheca* in the southern California National Forests using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Chorizanthe xanti var. *leucotheca* is southern California endemic species restricted to the alluvial fans, plains, and washes of the San Bernardino and San Jacinto, and Santa Rosa Mountains. It's distribution within the province is peripheral to the primary distribution, which often occurs below the Forest boundary in elevation.

Based on this analysis, *Chorizanthe xanti* var. *leucotheca* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Chorizanthe xanti var. *leucotheca* is on the SBNF Watch list. During project surveys, information will be recorded on occurrences of this taxon to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Chorizanthe xanti* var. *leucotheca* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Chorizanthe xanti* var. *leucotheca* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Chorizanthe rectispina

Clarkia delicata

Clarkia delicata

Clarkia delicata (Abrams) Nels. & MacBr. (Delicate Clarkia, Campo clarkia)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-2

General Distribution

Delicate clarkia occurs in the southern Peninsular Ranges of San Diego County and in northern Baja California, Mexico (Lewis 1993).

Distribution in the Planning Area

Within the southern California National Forests, *Clarkia delicata* is only known from the Cleveland National Forest (CNF) two recently documented locations at the Ritchie Creek and Hauser watersheds. Two additional undocumented observations were made in the upper San Diego River (Sproul pers. comm.) and in the northwest slope of Viejas Mountain (Rebman pers. comm.). In addition, several unconfirmed occurrences are mapped in the California Natural Diversity Database (CNDDDB) with imprecise locations, possibly occurring on CNF or adjacent private lands (California Natural Diversity Database 2004).

Taxonomy and Natural History

Clarkia delicata is a small annual erect herb with glabrous to glaucous above and pubescent below of < 7 dm. Leaf petioles are < 1 cm with blades of 1.5-4 cm long, lanceolate to elliptic to ovate. The inflorescence axis is erect in bud with reflexed buds. The hypanthium is about 2 mm with sepals staying fused in 4's. Corolla is rotate with petals of 8-12 mm, rose-lavender to pale pink in color and flowering from May to June. The petal claws are shorter than the blades. Outer anthers are orange and inner paler. Ovary is 8-grooved, with stigmas not exceeding the anthers (Lewis 1993).

It may be distinguished from similar species, such as *Clarkia similis*, by its erect inflorescence axis, petals that have a distinct claw, and other floral features, such as orange-red anthers (Lewis 1993).

Habitat Description

Delicate clarkia occurs in oak woodlands and chaparral communities at elevations of 760–3,250 feet (235–1,000 meters) (Lewis 1993, California Native Plant Society 2001). It appears to be associated with gabbro soils (USDA Forest Service 1998), although it is also found on other soil types derived from marine terrace deposits and granite (Hendricks pers. comm.).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 26 occurrences, nine of which are included in the table below (California Natural Diversity Database 2004). The majority of these occurrences are on private or lands on unknown ownership. Many of the CNDDDB occurrences potentially occur on the CNF, however these occurrences have imprecise location information. The CNF has two additional documented locations and two undocumented observations.

OCCURRENCE DATA of *Clarkia delicata* (Delicate clarkia) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
*	2-2	25	2002	Ritchie Creek / CNF	SD
*	*	U	-----	Upper San Diego River / CNF	SD
1	*	U	-----	So. of Morena Reservoir / CNF?	SD
2	*	U	-----	E. of Lyons / CNF?	SD
8	*	U	-----	Corte Madera Mtn. / CNF?	SD
11	*	U	-----	El Capitan Reservoir / CNF?	SD

12	*	U	-----	Featherstone Creek / CNF?	SD
17	*	U	1978	Black Mtn. junction with Lusardi Road / CNF?	SD
18	*	U	-----	Black Canyon Road / CNF?	SD
20	2-1	335	2001	Potrero vicinity / CNF	SD
22	*	U	-----	Viejas Mtn. / CNF?	SD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *CNF = Cleveland National Forest*
- *SD = San Diego County*

Threats

Populations on private lands lack protection and are declining because of increased urban and rural development (Stephenson and Calcarone 1999, USDA Forest Service 1998). The occurrence in the Potrero vicinity on the Cleveland National Forest is threatened by nonnative weed invasion. High fire-return intervals may type convert grassland savannahs to non-native annual grasslands (USDA Forest Service 1998). Threats to other locations on the Cleveland National Forest are unknown. However, the San Diego River occurrence may receive moderate levels recreation hikers. The Viejas Mountain is location abundant and receives few visitors. The Ritchie Creek location is within the newly purchased CNF property, which was historically grazed. Cattle from adjacent private lands occasionally stray on to the newly purchased property.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Clarkia delicata*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas. Survey non-specific CNDDDB records for confirmation.
- Monitor access to the Potrero location for threats of increasing nonnative annual grasses.
- Relocate and monitor recreation use at the upper San Diego River occurrence.

- Maintain fence integrity along newly purchased Rutherford property to deter stray cattle from accessing the Ritchie Creek drainage.
- Protect from high fire-return intervals from burning through known and potential occurrences.

Evaluation of Current Situation and Threats on National Forest System Lands

Clarkia delicata is considered to have low to moderate vulnerability on National Forest System lands. Most occurrences are located within areas receiving few visitors and impacts. Several occurrence records have been reported; however, verification of the locations and population status is needed. This species may be more common than documented as focused surveys have not recently been conducted, it is easily confused with *S. similis*, and it is easily missed if surveys are conducted during inappropriate seasons (Reiser 1994).

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Clarkia delicata is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Clarkia delicata* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Clarkia delicata* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

California Native Plant Society. 2001. *Inventory of rare and endangered plants of California (Sixth Edition)*. Sacramento, CA: California Native Plant Society.

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**Chorizanthe xanti var.
leucotheca**

Clarkia jolonensis

Clarkia jolonensis

Clarkia jolonensis Parnell (Jolon clarkia)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Clarkia jolonensis is endemic to Monterey County.

Distribution in the Planning Area

CalFlora (2002) lists 29 records for *Clarkia jolonensis* of which eight are from locations on or within the Los Padres National Forest. Two additional occurrences not referenced in CalFlora are also found on or near the Los Padres National Forest and are included in the table below. All of these locations are on or adjacent to the Monterey Ranger District.

Taxonomy and Natural History

Clarkia jolonensis is a dicot in the evening primrose family (Onagraceae). Characteristics that distinguish *Clarkia jolonensis* from other closely related congeners are: brown seeds; corolla bowl-shaped with pale lavender to pinkish lavender petals that lack claw and are generally red-flecked; and by flower buds that are reflexed on an inflorescence axis that is more or less straight.

Clarkia jolonensis is an annual herb that blooms from April through June (California Native Plant Society 2001).

Habitat Description

Clarkia jolonensis is found in chaparral, cismontane woodland, and coastal scrub plant communities at an elevation of 65 to 2,165 feet (20 to 660 meters) (California Native Plant Society 2001, Matthews 1997).

One occurrence of *Clarkia jolonensis* is found in the headwaters of the Nacimiento River watershed. Habitat at this location is described as riparian banks with the following associates: *Acer macrophyllum*, *Umbellularia californica*, *Alnus rhombifolia*, *Quercus wislizenii*, *Heteromeles arbutifolia*, *Amelanchier utahensis*, *Ceanothus integerrimus*, *Cornus glabrata*, *Symphoricarpos albus*, and *Quercus parvula* var. *shrevei*.

Occurrence Status

Population trends on National Forest System lands are unknown. *Clarkia jolonensis* was added to the Forest Watch List in 2003 and it has only been since that time that the Forest has begun to track this species.

Occurrences of *Clarkia jolonensis* (Jolon clarkia)

CalFlora ID	Date	Location	Observer
1208050	1901	Saw Mill mountains above; w of summit Santa Lucia Mtns.	Jepson (1685)
1269305	1950	Castro Canyon 1.5 mi s: Hwy 1	H. & M. Lewis (716)
1269303	1950	Malpaso Creek Bridge 44-17 2.4 mi s	H. & M. Lewis (719)
1269307	1950	Tassajara 1.2 mi w; on grade	H. & M. Lewis (732)
1269302	1950	Cachuga 2.8 mi nw of road to Tassajara	H. & M. Lewis (722)
1237314	1973	China Camp near Los Padres NF, Chews Ridge region	Griffin (3747)
1307501	1962	Reliz Canyon, Santa Lucia Mountains	Hardham (10298)
1424276	1926	Big Sur	Margaret Stason

n/a	1995	Near Nacimiento-Ferguson Road bridge over Nacimiento River, 4.4 km S of San Antonio River.	Wilken, Neese, & Painter
n/a	1960	Mill Creek Road to Alder Creek (South Coast Ridge Road?)	Hardham (6049)

Threats

Clarkia jolonensis is threatened by grazing (California Native Plant Society 2001) in at least portions of its range and perhaps by trampling from dispersed recreation use. Dominance by nonnative annuals is also a likely threat to this taxon.

Conservation and Management Considerations

More information is needed for occurrences of *Clarkia jolonensis* on National Forest System lands. Surveys should be conducted to relocate the historic occurrences listed in the occurrence table. Relocated occurrences should be evaluated for current threats.

Evaluation of Current Situation and Threats on National Forest System Lands

Clarkia jolonensis is found only in Monterey County and a large part of its current and historic range is on the Los Padres National Forest in areas managed for livestock grazing.

Based upon the above analysis *Clarkia jolonensis* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	B	A

Habitat for *Clarkia jolonensis* may have been affected by past land management activities including road construction and grazing. Currently, grazing is a continuing land use in *Clarkia jolonensis* habitat,

but grazing intensity has decreased over historic levels and grazing use would remain the same or decrease slightly under Alternatives 1-5. Therefore, it is assumed that habitat for *Clarkia jolonensis* is stable and would remain so under all alternatives except Alternative 6. Under Alternative 6, the amount of reduction of suitable grazing acres on National Forest System (NFS) land may allow *Clarkia jolonensis* occurrences to increase in abundance and to again become well distributed across its historic range on NFS land.

Viability Outcome Statements for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	B

Habitat for *Clarkia jolonensis* has been fragmented by ranching, military operations and facilities, and by rural developments. Further isolation of *Clarkia jolonensis* occurrences may occur on private lands. This potential for increased fragmentation would not be substantially affected by the alternatives except that under Alternative 6 there may be sufficient recovery of habitat on NFS lands to compensate for lost habitat on private land. This finding is based on the assumption that there is more habitat for *Clarkia jolonensis* on NFS land than there is on private and military lands.

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Clarkia delicata	Claytonia lanceolata var. peirsonii
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Claytonia lanceolata var. peirsonii

Claytonia lanceolata Pursh var. *peirsonii* M. & J. (Peirson's spring beauty)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T1Q; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Claytonia lanceolata var. *peirsonii* is endemic to the eastern San Gabriel Mountains in Los Angeles and San Bernardino County, above 7,500 feet (California Native Plant Society 2001).

Distribution in the Planning Area

Claytonia lanceolata var. *peirsonii* is known from occurrences along the boundary between the Angeles and San Bernardino National Forests, all of which are in the planning area. These occurrences extend from the eastern side of Mount San Antonio to the Kelly's Camp area (Mistretta and Brown 1987; California Natural Diversity Database 2004). Two occurrences (Timber Mountain and Telegraph Peak) are in or partly in the Cucamonga Wilderness Area. Populations have been observed at Kelly's Camp, Thunder Mountain, Devil's Backbone Ridge, East Telegraph Mountain Ridge, and Timber Mountain in the eastern San Gabriel Mountains (Krantz 1980).

Taxonomy and Natural History

Claytonia lanceolata var. *peirsonii* is a dicotyledonous plant in the purslane family (Portulacaceae). The variety *peirsonii* is recognized by Munz (Munz and Keck 1973) and by the California Native Plant Society (2001), but is not recognized in *The Jepson Manual* (Chambers 1993). If *Claytonia lanceolata* var. *peirsonii* actually is synonymous with *Claytonia lanceolata*, as described by Chambers (1993), the occurrences in the planning area would be disjunct from the Sierra Nevada rather than a San Gabriel Mountains endemic species.

Claytonia lanceolata var. *peirsonii* is a perennial plant that grows from a small, spherical corm. It usually flowers May-June (California Native Plant Society 2001), but has been observed in flower in late April. In the spring, vegetative and floral parts develop under snow cover and are etiolated at the time of snow withdrawal. As the snow withdraws, the plant grows and flowers quickly; seed dispersal is generally complete within 30 days. In populations of western spring beauty (var. *lanceolata*) in Washington, plants have been observed to flower within three days of snowmelt and fruited ten days later (Douglas and Taylor 1972). The stamens mature first and wither after one day. The flowers are functionally male at first and then become functionally female for up to eight days; consequently, self-fertilization is rare. Pollinators are thought to be generalists. Like many other species of *Claytonia*, the seeds have an appendage that is attractive to ants, which are dispersal agents for the species. (Mistretta and Brown 1987)

Claytonia lanceolata var. *peirsonii* has a globose corm, 1-2 cm in diameter, largely subterranean 5-7 cm stems, a thick basal leaf with a blade roughly 1 cm long, and short-petiolate cauline leaves that are widest below the middle, 7-12 mm wide. Flowers are few, subumbellate, with 1-2 cm petioles, 3.5-5 mm sepals, and pinkish petals, 8-12 mm long that are more or less emarginate at the apex. The capsules are ovoid, approximately 4 mm long with shining black seeds about 2 mm long. (Munz 1974) The flowers appear to be protandrous, with stamens maturing before the stigma becomes reproductive (Center for Plant Conservation 2002).

Habitat Description

Claytonia lanceolata var. *peirsonii* grows on north and northwest-facing slopes of dry ridges and steep scree slopes between 7500-9000 ft (Center for Plant Conservation 2002). It is found in the understory of montane coniferous and subalpine forests under lodgepole pine, sugar pine, and white fir. *Claytonia lanceolata* var. *peirsonii* requires some tree canopy cover, but does not tolerate shrub cover or deep litter. Occurrences are usually found on steep, sheltered north-facing slopes that hold snow late in the year (Mistretta and Brown 1987). Associated species include *Abies concolor*, *Allium burlewii*, *Arctostaphylos patula*, *Chaenactis santolinoides*, *Chrysolepis sempervirens*, *Draba corrugata*, *Oreonana vestita*, *Pedicularis semibarbata*, *Penstemon grinnellii*, *Pinus lambertiana*, *Pyrola picta*, and *Ribes cereum* var. *cereum* (Soza and Boyd 2000).

Habitat associations for *Claytonia lanceolata* var. *peirsonii* are narrowly distributed within the San Gabriel Mountains. Some of its suitable habitat has been developed into ski areas; other suitable habitat is threatened by ski area expansion.

Occurrence Status

Population sizes are highly variable within individual occurrences and have been affected by fire, browsing, and recreation. However, populations appear to be relatively stable within natural fluctuations. There was a large increase in the numbers of individuals at several occurrences in 2000 (Center for Plant Conservation 2002). Surveys for *Claytonia lanceolata* var. *peirsonii* were conducted at

the five known occurrences in 1980, 1987, and 2000, and the results are described by Mistretta and Brown (1987). Population sizes fluctuated at the individual sites, but the overall number of plants counted was approximately the same (1,670) in the two surveys. Three occurrences that were monitored annually from 1987 to 1993 showed fluctuations in population sizes within a normal range of variation. Two occurrences were affected by fire in 1980, but appeared to recover by the next year (Mistretta and Brown 1987; California Natural Diversity Database 2004).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Claytonia lanceolata* var. *peirsonii* (Peirson's spring beauty)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	1167 in 2000; 500 in 1979; < 20 in 1981 (fire in 1980); up to 1000 in 1986; 360 in 1987; 1,167 in 2000	2000, 1979-1987	Above Delker Cyn, above & below trail 7W08, immediately east of Kelly's Camp, San Gabriel Mountains. On north aspect of forested draw at head of canyon. Plants clustered to scattered in shade or open sun. Most plants above trail. The construction of Kelly's Cabin may have eliminated some habitat. In addition, deer and sheep browsing, indicated by plants chewed down to the red stubs of stems, inhibited flowering. Camping and hiking impacts. Trail through population. Off-trail impacts could easily eliminate populations. SBNF.	SBD

2	1,279 in 2000; 475 in 1987	1980, 1987	<p>Timber Mountain-4 acres (3 on ANF, 1 on SBNF); 300 plants in 1980. Draws, other areas holding persistent snow. population is crossed by trail 7W06, but off trail hiking is unlikely given terrain. Locally abundant on mid to lower slopes, occasional on upper slopes. Mostly in shade of <i>Pinus murrayana</i> or filtered shade and clustered together. Occasionally in open sun and scattered. Mostly pristine/undisturbed population, partly within the boundary of the Cucamonga Wilderness Area.</p>	SBD LA
3	165 in 2000; < 100 plants in 1980; 175 in 1987; 165 in 2000	2000; 1980, 1987	<p>Telegraph Ridge: 1 acre;. Moderate browse damage. Steep scree slopes, draws. w/ <i>Abies concolor</i>, <i>Allium burlewii</i>, <i>Calyptridium cf. umbellatum</i>, <i>Chrysolepis sempervirens</i>, etc. Within the boundaries of the Cucamonga Wilderness, mostly undisturbed. ca. 40% of plants grazed. ANF.</p>	LA
4	200 in 1980; 420 in 1987	1987, 1980	<p>Thunder Mountain: 4 acres. Scree slopes. Ski lift and heavily graded runs have little or no vegetation left to provide cover for <i>Claytonia lanceolata</i> ssp. <i>peirsonii</i>. In these areas, plants dried up before flowering or setting fruit. Population is declining; habitat loss estimated as > 50%. Severe rodent/insect browse inhibited flowering. ANF.</p>	LA

5	205 in 2000; 400 in 1980; 245 in 1987; 205 in 2000	2000, 1987, 1980	Devil's Backbone: 2-3 acres. Steep scree slopes. Clustered beneath <i>Abies concolor</i> , <i>Pinus</i> spp. or growing locally w/ <i>Lithophragma</i> sp. Within area of proposed expansion of Mt. Baldy Ski Area. Foot traffic and tree removal has eliminated portions of this population. Remaining pockets to the east of Lift 1-A are undisturbed. Population declining (due to effects of ski area expansion). Grazing evident on 27% of population. Occasional trash. ANF.	LA
*	U	1980	San Gabriel Mts. Ontario Ridge. Below trail to Kelly's Camp. Cucamonga Wilderness (Krantz/RSA)	SBD
*	U	1987	Angeles National Forest. N aspect of thunder Mt. E of ski run on steep slope of unstable talus below mixed conifer woodland (Mistretta/RSA)	LA

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

Threats

Threats to *Claytonia lanceolata* var. *peirsonii* include trampling by hikers and equestrians. Three of the occurrences (Kelly's Camp (occ. no. 1), Timber Mountain (occ. no. 2), and Devil's Backbone Ridge (occ. no. 5) are in close proximity to busy trails and campgrounds. (California Natural Diversity Database 2004) Expansion of ski runs at the Mount Baldy Ski Area has significantly reduced conifer cover and partially eliminated the Thunder Mountain occurrence (occ. no. 4) (Mistretta and Brown

1987). Ski-related activities have also adversely affected the occurrence at the Devil's Backbone Ridge (occ. no. 5).

Fire is not a substantial threat to *Claytonia lanceolata* var. *peirsonii*. A fire in 1980 temporarily reduced the population size in occ. no. 1, but this population appeared to recover within two years.

Conservation and Management Considerations

A species management guide was adopted by the Angeles National Forest in 1987 (Mistretta and Brown 1987) to provide management direction to protect all known populations of *Claytonia lanceolata* var. *peirsonii*. Site-specific guidelines include monitoring, meeting with ski-area representatives, and conducting further surveys of potential habitat with a focus on the northern slopes of Cucamonga, Ontario, and Etiwanda peaks.

The following is a list of conservation practices that should be considered for *Claytonia lanceolata* var. *peirsonii*:

- Continue implementation of the site-specific guidelines described in the species management guide on the ANF and extend this implementation to include known habitat on the SBNF.
- Survey all new occurrences of *Claytonia lanceolata* var. *peirsonii* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Claytonia lanceolata* var. *peirsonii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Claytonia lanceolata* var. *peirsonii* in the southern California National Forests using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Claytonia lanceolata var. *peirsonii* is a rare, narrowly-distributed endemic species known only from the high eastern San Gabriel Mountains. If the taxonomy described in Chambers (1993) is valid, the distribution of this species in southern California is a rare disjunct from the Sierra Nevada. Either way, none of the recorded occurrences are fully protected from identified threats.

Based on the above analysis, *Claytonia lanceolata* var. *peirsonii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Claytonia lanceolata var. *peirsonii* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level. The primary ongoing threats to this species are trail use and maintenance, and associated off-trail use near watercourses.

Under Alternatives 1, 2, 3, and 6, this species would be at continued risk from hiking and equestrian impacts to its habitat at approximately current levels. Under Alternatives 4 and 5, an expected increase in road and trail use and maintenance, and possibly additional ski area impacts, increase risks above current levels.

The effects of land use zoning on this species are similar across all alternatives. The majority of this species' distribution is and will continue to be within rugged areas with few roads and limited potential for new roads and trails. About half of the known habitat for this species is within the boundaries of Cucamonga Wilderness. Under Alternatives 4a and 6, additional recommended wilderness areas including habitat for *Claytonia lanceolata* var. *peirsonii* would be expanded and would provide additional habitat protection.

Consideration of the Suitable Use restricting vehicle travel to designated Forest Transportation System roads and trails, along with Standards regarding recreation and wilderness management factor into these outcomes.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

These outcomes assume that *Claytonia lanceolata* var. *peirsonii* is a valid San Gabriel Mountains endemic taxon. Since all occurrences are restricted to a small area of the planning area, and none occur

off of NFS land, these outcomes are the same as those above. By maintaining the current distribution of *Claytonia lanceolata* var. *peirsonii* on National Forest System lands, there are no cumulative effects that would cause *Claytonia lanceolata* var. *peirsonii* to suffer a decline in its overall distribution.

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Cupressus forbesii

Cupressus forbesii Jeps. (Tecate cypress)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-2

General Distribution

Cupressus forbesii, Tecate cypress, has a limited distribution in the United States, with only four populations known. Its distribution is centered in the southern Peninsular Ranges of Baja California Norte, Mexico. The northernmost population occurs in a 960-acre (390-hectare) grove at Sierra Peak/Coal Canyon in the Santa Ana Mountains, Orange County, in an unnaturally occurring stand where trees were planted. Naturally occurring stands are located in San Diego County, including a 50-acre (20-hectare) grove on Guatay Mountain in the Laguna Mountains, a 5,000-acre (2,025-hectare) grove on Otay Mountain, and small groves east of Otay Mountain. Numerous groves of *Cupressus forbesii* occur on the Mexico side of Otay and Tecate peaks and in the coastal mountains of Baja California Norte, extending about 150 miles (241 kilometers) down the peninsula (USDA Forest Service 1991, Stephenson and Calcarone 1999, California Department of Fish and Game 2002).

Distribution in the Planning Area

Cupressus forbesii occurs on the Cleveland National Forest in the Descanso District on Guatay Mountain; however, half of the Guatay Mountain population is on adjacent private land. The Sierra Peak/Coal Canyon grove is located just outside of the Cleveland National Forest (Stephenson and Calcarone 1999). However, this grove at Sierra Peak on was planted as part of an old homestead and does not constitute a natural occurrence. The Otay Mountain grove is mostly situated on land managed by the Bureau of Land Management. Most (85%) *Cupressus forbesii* within the United States is located on public lands (Stephenson and Calcarone 1999, California Native Plant Society 2001).

Taxonomy and Natural History

Cupressus forbesii is an evergreen gymnosperm tree less than 33 feet tall with multiple trunks, generally without a terminal shoot. Bark peels to in thin plates to smooth, polished, cherry-red or mahogany-brown in color. Leaves are a rich light green to a dull green. Seed cones are closed, 0.8-1.2 inches, spheroid with 6-10 scales (Bartel 1993).

Fire induces seed release from cones, while trees are killed. Post fire environmental conditions, induce seeds to germinate and reestablish the population (Stephenson and Calcarone 1999). New seedlings trees require 10 years before cone production begins and 50 years to reach maximum cone production. Stands usually require 35-40 years of growth to reproduce sufficient seeds for stand replacement (Dunn 1987). Stands at least 52 years old produced a greater number of seedlings per pre-burn tree following a fire (Zedler 1977). Additionally these stands reestablished at densities several times higher than pre-fire densities (Zedler 1977). Keeley (1981) estimates a natural fire frequency of 50-100 years for *Cupressus forbesii* stands. Although increasing mortality thins stands as trees age, individual trees in more open stands produce more cones per tree than in dense stands, so that cone production per unit area remains relatively constant across a range of stand density and age (Dunn 1987).

Habitat Description

Cupressus forbesii occurs from elevations as low as 65 feet (20 meters) in Baja California Norte to 4,200 feet (1,280 meters) in the Laguna and Santa Ana Mountains. It is usually found on mesic east- or north-facing slopes. *Cupressus forbesii* grows in alkaline, clay soils derived from ultramafic gabbroic rocks or metavolcanics. Like *Cupressus stephensonii* (Cuyamaca cypress), *Cupressus forbesii* can be the defining component of southern interior cypress forest, which is a dense, fire-maintained low forest that forms even-aged stands surrounded by chaparral. Ceanothus, scrub oak, and chamise species are commonly found with *Cupressus forbesii*, and the trees may also be viewed as a phase of chaparral vegetation (Stephenson and Calcarone 1999).

Two federally listed plants, Braunton's milkvetch (*Astragalus brauntonii*) and Mexican flannelbush (*Fremontodendron mexicanum*), are found with *Cupressus forbesii*. Larvae of the rare Thorne's hairstreak butterfly (*Mitoura thornei*) are found exclusively with *Cupressus forbesii* (Brown 1982); however, the butterflies have only been observed in the grove on Otay Mountain, outside the National Forest (Stephenson and Calcarone 1999).

Occurrence Status

The California Natural Diversity Database (CNDDB) reports 16 occurrences of *Cupressus forbesii* (California Department of Fish and Game 2002). The majority of these occurrences are on protected state or federal lands (Bureau of Land Management, Forest Service) and five occurrences located in private lands. The Cleveland National Forest has two naturally occurring populations at Guatay Mountain. The majority of cypress trees at the Guatay stand are over 100 years old. The other two

record occurrences are planted groves.

OCCURRENCE DATA of *Cupressus forbesii* (Tecate cypress) on National Forest lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
1	*	U	1979	Sierra Peak / CNF – planted population	OR/RIV
2	*	U	1979	Above Temescal Canyon / CNF – planted pop.	RIV
7	2-1	1000+	1984	Guatay Mt / CNF	SD
15	2-3	30	1993	Guatay Mt. / CNF	SD

- U = Unknown.
- * = an occurrence number has not been assigned.
- CNF = Cleveland National Forest
- OR = Orange County
- RIV = Riverside County
- SD = San Diego County

Threats

Reduced stand densities are attributed mainly to increases in fire frequency. Data collected at both Tecate Peak and Otay Mountain suggest that some of the groves there are diminishing in size (Dunn 1989). *Cupressus forbesii* groves experiencing fire frequencies of less than 30-year intervals will have reduced stand replacement survivorship. Stands require at least 35-40 years to reproduce sufficient seeds for stand replacement (Dunn 1987). However, stands also require hot fire to release seeds from cones to replace decadent trees and stands. Excluding fire completely may have undesirable consequences. *Cupressus forbesii* cones may gradually release seeds after several to many years in the absence of fire, but release of seeds is inefficient and viability is low. Seedling recruitment can occur in mature cypress stands, however, survivorship is reduced after the first year of establishment. Consequently, fire is necessary for population viability and must occur prior to tree senescence or reduced cone production.

The cones require a high intensity crowning fire, to release the seeds. Cypress trees are sensitive to fire and can be killed from even radiant heat. Low intensity fires could kill trees without releasing the seeds and may permit larger number of shrubs and herb seeds to survive, increasing competitive pressures on the cypress stands.

Mining activities have also adversely affected *Cupressus forbesii* in southern California. Strip mining of underlying clay deposits destroyed some groves on private lands in the Sierra Peak/Coal Canyon area of the Santa Ana Mountains (Stephenson and Calcarone 1999).

Borer beetles have been suggested as a threat to this species and could warrant monitoring for impacts (Klein pers. comm.).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Cupressus forbesii*:

- Consider establishment of Guatay Mountain as a Research Natural Area.
- Guatay Mountain is an established Special Interest Area. Utilize this special area designation to best manage this taxon.
- In the event of fire, allow fire to burn freely through stand. Confine fire suppression activities and fuelbreak construction to the perimeter of the stand. Use handline as a preferred method of fire line construction.
- After fires, construct fencing to prevent grazing within the stand for at least 10 years to allow cypress regeneration.
- After the next fire, manage stand so that fires occur on greater than 50 year interval.
- In the absence of fire, *Cupressus forbesii* stands should be monitored for signs of severe population decline. A controlled fire may be necessary if widespread mortality (from disease or other catastrophic event) and a corresponding decrease in cone production is observed. Prescribed hot fire in these older stands may be necessary to maintain population viability. This management strategy should be used conservatively and only in an experimental capacity.
- Reduce fuel loads (via mechanical thinning) around stands at Guatay Mountain that are less than 40 years old.

Evaluation of Current Situation and Threats on National Forest Systems Lands

Cupressus forbesii is considered to have low to moderate vulnerability on National Forest System lands. The majority of the trees on Guatay Mountain are over 100 years old. The Guatay Mountain *Cupressus forbesii* population appears to be in good health and not conspicuously declining, though some dead trees are present. Existing trees would be killed from a wildfire; however, the stands would successfully regenerate if fire intensity were sufficiently hot to release seeds from cones. Suppression of a high intensity wildfire through the cypress stands is not urgent and may be undesirable. The Guatay Mountain occurrence on the Cleveland National Forest is within an established Special Interest Area.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon and disjunct in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Cupressus forbesii is a USDA Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Cupressus forbesii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Lands within Range of Taxon

By maintaining the current distribution of *Cupressus forbesii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Claytonia lanceolata var.
peirsonii**

Cupressus sargentii

Cupressus sargentii

Cupressus sargentii Jepson (Sargent cypress)

Management Status

Federal: None

California: Not listed (California Natural Diversity Database)

Heritage Rank: Not ranked (California Natural Diversity Database)

California Native Plant Society (2001): Not listed

General Distribution

Cupressus sargentii is the most widely distributed cypress species in California. Groves are scattered from Mendocino County to the Santa Lucia Range and the southern Los Padres region in Monterey, San Luis Obispo, and Santa Barbara Counties. *Cupressus sargentii* groves occur at elevations of 650-3,300 feet (200-1,000 meters). Based on Clare Hardham's mapping effort, an estimated 1,585 acres (641 hectares) of *Cupressus sargentii* occur in central and southern California, of which 74 percent is on public lands. A small amount is found on Fort Hunter Liggett Military Reservation (Stephenson and Calcarone 1999). It is also documented at Camp San Luis Obispo (Painter 2004).

Distribution in the Planning Area

There are an estimated 880 acres (356 hectares) of *Cupressus sargentii* on the Los Padres National Forest. Three substantial groves occur at Zaca and Alder Peaks and in the Cuesta Ridge Botanical Area. At least six additional groves are also located in the Santa Lucia Range. The grove at Cuesta Ridge in the southern Santa Lucia Range is the southernmost large occurrence and one of several isolated groves between northern Mendocino County and Zaca Peak in Santa Barbara County. The Zaca Peak grove, located near the San Rafael Wilderness Area in the San Rafael Mountains, is much smaller than the occurrence at Cuesta Ridge. Additional information can be found in studies done on Cuesta Ridge by Bollong in 1976 (Painter 2004).

In the Santa Lucia Range, the majority of groves are located along the main ridgeline at an elevation of about 2,500 feet (762 meters). *Cupressus sargentii* also occurs along a ridge formed by the King City Fault near Bryson and at lower elevations in the Los Burros Creek drainage (Stephenson and Calcarone

1999).

Taxonomy and Natural History

Cupressus sargentii is a gymnosperm in the cypress family (Cupressaceae)

Cupressus sargentii is an evergreen monoecious shrub or tree (Bartel 1993). Fire plays an integral role in the life cycle of *Cupressus sargentii*. Unable to resprout after fire, *Cupressus sargentii* is an obligate seeder that needs fire to stimulate seeds to germinate. Stands need 20-30 years between fires to replace the seed bank. However, older stands have lower seedling density, possibly due to reduced seed viability in old cones or higher fire intensity in older stands. *Cupressus sargentii* does not appear to invade chaparral; chaparral shrubs typically resprout following fire, and *Cupressus sargentii* seedlings do not establish well under a canopy (Ne'eman and others 1999).

Habitat Description

Cupressus sargentii is an indicator of serpentine soils and tends to occur with other sensitive plant species. Factors other than soil affect the distribution of *Cupressus sargentii*, however, as it occupies less than three percent of serpentine habitat on the Los Padres National Forest. The species grows on rocky slopes, ridges, and raised stream benches and terraces. Throughout most of its range, *Cupressus sargentii* occurs with gray pine (*Pinus sabiniana*), Coulter pine (*P. coulteri*), scrub oak (*Quercus berberidifolia*), leather oak (*Q. dumosa*), and buck brush (*Ceanothus cuneatus*). It also frequently grows with California bay (*Umbellularia californica*), interior live oak (*Q. wislizenii*), and knobcone pine (*P. attenuata*). Muir's hairstreak butterfly (*Mitoura muiri*) is strongly allied with *Cupressus sargentii* (Stephenson and Calcarone 1999).

Population Status

Cupressus sargentii is generally not considered a rare tree and has no legal status. However, because it is localized on serpentine soil and because some groves, particularly in the Monterey Ranger District on the Los Padres National Forest, have been reduced in size by short fire-return intervals, *Cupressus sargentii* communities are considered rare on National Forest System lands (Stephenson and Calcarone 1999).

Threats

Cupressus sargentii may be threatened by fire frequencies that are too high. Otherwise, current management activities on National Forest System land are not affecting this species.

Conservation and Management Considerations

Like other cypress species, *Cupressus sargentii* is adapted to and dependent on fire for seed dispersal

and enhancement of germination. Fires that are too frequent, however, prevent adequate seed production and can extirpate entire groves. South of an existing Waterdog Creek grove, a cypress "swamp" is believed to have been extirpated by fires in 1953 and 1960. The species has a low-branching characteristic that makes it susceptible to crown fire; it is often killed in wildfires. Required fire-free time intervals are not well defined for the species but might be consistent with other cypress species in California (Stephenson and Calcarone 1999).

Evaluation of Current Situation and Threats on National Forest System Lands

Based upon the above analysis this species has been assigned the following risk category:

3. Common or widespread in plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Cupressus sargentii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Cupressus sargentii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Cupressus forbesii

Cupressus stephensonii

Cupressus stephensonii

Cupressus stephensonii Wolf (Cuyamaca cypress)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G1, S1.2 (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Cupressus stephensonii, Cuyamaca cypress, is endemic to the Cuyamaca Mountains of San Diego County and is the most narrowly distributed cypress in California. *Cupressus stephensonii* occurs in several groves in the Cuyamaca Peak/King Creek areas (USDA Forest Service 1994, Stephenson and Calcarone 1999).

Distribution in the Planning Area

Cupressus stephensonii groves represent a single population that occurs naturally over an estimated 230 acres (93 hectares), both on the Cleveland National Forest and in Cuyamaca Rancho State Park. In 1991, the Cleveland National Forest established the King Creek Research Natural Area to protect *Cupressus stephensonii* and its habitat. A population on the Cleveland National Forest in the Agua Tibia Wilderness near Palomar Mountain, apparently planted by homesteaders (Stephenson and Calcarone 1999, USDA Forest Service 1994), was destroyed in the Pechanga Fire in 2000.

Taxonomy and Natural History

Cupressus stephensonii is a closed-cone conifer tree, 10-16 meters high. Bark is smooth, thin, and peels in red thin stripes on mature trunks. Foliage is blue-gray or gray-green. Female cones are about 2.5 cm in diameter with 4-8 often, conspicuous scales of 2-4 mm long. Seeds are 4-8 mm, often not glaucous (Bartel 1993).

Cupressus stephensonii is a gymnosperm in the cypress family (Cupressaceae) (Bartel 1993). Some

taxonomists believe that the tree is not distinct from Arizona cypress (*C. arizonica* ssp. *arizonica*), which ranges from Arizona into the neighboring mountain ranges in Sonora and the Sierra Juarez in Baja California Norte, Mexico (Bartel 1993, Eckenwalder 1993). Others have classified it as a subspecies of Arizona cypress, *C. arizonica* subsp. *stephensonii* (Beauchamp 1986). More recent genetic work indicates that *Cupressus stephensonii* should be maintained as a distinct species (California Native Plant Society 2001). Research by Connie Millar (USDA Forest Service PSW Research Station, Berkeley) on isozymes separates *Cupressus stephensonii* from the *Cupressus arizonica* complex, as does morphological and DNA sequence data for four genes by Damon Little at Cornell University (*C. Burrascano* pers. comm.).

Cupressus stephensonii is a closed-coned conifer that relies on fire for reproduction. Fire is required to open the cones so that seeds are shed. Fire is also important because it enhances seed germination. Cones may open as a result of old age or other causes, but seeds rarely become established in the absence of fire. *Cupressus stephensonii* seeds germinate during the winter following a fire event (USDA Forest Service 1994).

Habitat Description

Cupressus stephensonii usually grows in gabbro-derived clay soils on steep slopes along drainages. It can be dominant in the canopy or co-dominant with Coulter pine (*Pinus coulteri*) and coast live oak (*Quercus agrifolia*). The species occurs at elevations of 3,400-5,600 feet (1,030-1,705 meters). Groves are typically surrounded by chaparral vegetation composed of chamise, manzanita, and scrub oak. Two other rare plants, Dunn's mariposa lily (*Calochortus dunnii*) and Orcutt's brodiaea (*Brodiaea orcuttii*), may be found with *Cupressus stephensonii* (Stephenson and Calcarone 1999, California Native Plant Society 2001).

The entire stand on the Cleveland National Forest and Cuyamaca Rancho State Park was burned in 1950 in the Conejos Fire. A portion of this stand on Cuyamaca State Park burned again in 1970. These stands or a portion of the stands burned again in the 2003 Cedar Fire.

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 3 occurrences of *Cupressus stephensonii* (California Natural Diversity Database 2002).

These occurrences are on 230 acres (93 hectares) both on the Cleveland National Forest and in Cuyamaca Rancho State Park. Within the Cleveland National Forest, the *Cupressus stephensonii* is included within the King Creek Research Natural Area established in 1991. One CNDDDB occurrence (of one plant) is reported as extirpated, possibly from the Conejos Fire of 1950 (California Natural Diversity Database 2002).

OCCURRENCE DATA of *Cupressus stephensonii* (Cuyamaca cypress) on National Forest System

lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
1	2-1	2.5 acres	1980	King Creek / CNF	SD

- CNF = Cleveland National Forest
- SD = San Diego County

Threats

Cupressus stephensonii is threatened by short fire intervals and fires of low intensity. *Cupressus stephensonii* trees require hot fires to release seeds. However, as with the rare Tecate cypress (*Cupressus forbesii*), stands require long periods -- greater than 40 years -- to mature and produce sufficient seed banks to regenerate stands following a stand-replacing fire (Zedler 1977). However, low intensity fires may kill trees and not release seeds.

This species may also be adversely affected by insect infestation, mining, extreme fires, and increasing fire frequency (USDA Forest Service 1994).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Cupressus stephensonii* (USDA Forest Service 1994):

- Due to the 2003 Cedar fire, additional protection of the stand, including fire suppression, and monitoring is necessary for the establishment of seedlings and growth until cone bearing age. Optimal protection would be until 2053. Protection from short interval fires may also decrease inbreeding within and among the subpopulations. Inbreeding may be intensified among the few inbred genetic lines by repeated fires, due to delayed sexual maturity of plants and the limited seed dispersal distance (Rehfeldt 1997). Crossing of the inbred lines to redistribute the genetic variability and planting those new individuals in natural and *ex situ* sites may be strategies in conservation of the *Cupressus stephensonii* (Rehfeldt 1997).
- Manage the *Cupressus stephensonii* stand for fire intervals of 50-150 years. Active fire suppression is needed until 2053 or 2063. Confine fire suppression activities and fuelbreak construction to the perimeter of the stand. Use handline as a preferred method of fire line construction. Construct fuelbreaks where needed, primarily to the west of the stand.
- Following 2063, unless they burn again between now and then, fire should burn through stands.
- Work with adjoining landowners (private, state, county) to emphasize protection of *Cupressus*

stephensonii in all proposed actions.

- Maintain and post boundaries of the King Creek Research Natural Area to discourage unauthorized use.
- Pursue land acquisition where feasible to establish a buffer for the area.
- Encourage research on the biology and reproduction of *Cupressus stephensonii*. For research collections, remove no more than 1% of branches and foliage and no more than 5% of cones from any one tree. Cone collectors will be asked to donate 10% of seed collected to the Placerville Institute of Forest Genetics for storage.
- In the absence of fire, *Cupressus stephensonii* stand should be monitored for signs of severe population decline. A controlled fire may be necessary if widespread mortality (from disease or other catastrophic event) and a corresponding decrease in cone production is observed. Prescribed hot fire in these older stands may be necessary to maintain population viability. This management strategy should be used conservatively and only in an experimental capacity.

Evaluation of Current Situation and Threats on National Forest Systems Lands

Cupressus stephensonii was considered to have moderate vulnerability on National Forest System lands prior to the Cedar fire in 2003. The majority of the cypress trees at King Creek were approximately 30 - 50 years old, with subpopulations appearing to be in good health, until the stand burned in the 2003 Cedar fire. The stand is expected to regenerate from seed, however complete protection from fire is needed until at least 2053. Sufficient stand regeneration was observed following the Conejos Fire in 1950. If fire were to be excluded for a minimum of 50-year interval fires, the King Creek/Cuyamaca Rancho State Park stand should have low vulnerability to extirpation. The presence of urban interface on the south side of this occurrence increases this risk.

The stand is protected from disturbance within King Creek Research Natural Area, which has a management strategy directing protection of the stand and management of fire return intervals. Because of the inaccessibility of most of the stand within its matrix of chaparral, few other Forest Service activities have the potential to affect the trees. The major threat to the species at this time is the risk of reburning in less than 40 or 50 years (short fire return interval).

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon and narrow endemic, in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
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E	E	E	E	E	E	E
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Cupressus stephensonii is a USDA Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Under all alternatives, management of *Cupressus stephensonii* is within the King Creek Research Natural Area, established to conserve and protect the species due to its limited distribution. The stand is at risk of stochastic extirpation should another fire occur before trees reach reproductive maturity, a risk that is the same under all alternatives.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

Cupressus stephensonii is restricted to the King Creek Research Natural Area and adjacent Cuyamaca Rancho State Park in San Diego County. All populations are relatively protected from management activities yet are subject to natural stochastic events, such as wildfires and possibly subsequent suppression activities.

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Cupressus sargentii

Deinandra floribunda

Deinandra floribunda

Deinandra floribunda (A. Gray) Davidson & Moxley (Tecate tarplant)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-2

General Distribution

Deinandra floribunda, Tecate tarplant, is endemic to the Peninsular Ranges of southern San Diego County and Baja California, Mexico (Keil 1993; California Native Plant Society 2001).

Distribution in the Planning Area

No occurrences of *Deinandra floribunda* are known on National Forest System lands, although potential habitat is present on the Cleveland National Forest (Stephenson and Calcarone 1999). *Deinandra floribunda* potentially occurs in the Descanso Ranger District in Hauser Canyon, Thing Valley, and La Posta Creek.

Taxonomy and Natural History

Deinandra floribunda is a herbaceous annual, 6 - 40 inches tall, soft hairy below and glandular above. Leaves are 1-2 inches, with entire toothed oblanceolate lower leaves and entire linear-lanceolate upper leaves. Stems and leaves are light green and aromatic. Inflorescence heads are short peduncled and with involucre of ¼ inch. Heads have 13-20 deep yellow ray flowers with ligules ¼ inch. Corollas of disk flowers are yellow of 24-31 per flower head with black anthers (Keil 1993). Plants flower from August to October (California Native Plant Society 2001).

This species was treated as *Hemizonia floribunda* in *The Jepson Manual* (Keil 1993). However, studies of *Deinandra mojavensis* and related species have determined that the previous generic concept of *Hemizonia* encompassed several morphologically and genetically diverse lineages that should be treated

as separate genera (Baldwin 1999). *Deinandra* includes those species with beaked fruits and bright yellow flowers but lacking spine-tipped leaves and bracts. The name change is documented in Baldwin (1999). See also Jepson Flora Project (2005).

Habitat Description

Deinandra floribunda grows along narrow drainages and sandy washes in chaparral at elevations to 4,000 feet (1,220 meters) (California Native Plant Society 2001). It can typically be found growing with limited shrub cover, enabling plants to grow with limited vegetative competition (Reiser 1994) in soils that are well drained Reiff, Tollhouse, Mottsville and La Posta series, including sandy ravines, alluvial areas, grassy areas. *Associated species include Linanthus bellus, Lathyrus splendens, Ipomopsis tenuifolia, Berberis higginsiae, Mimulus aridus and Fraxinus trifoliata* (USDA Forest Service 1998).

Occurrence Status

The California Natural Diversity Database contains records for 17 occurrences of *Deinandra floribunda* (California Department of Fish and Game 2002). Ten of the occurrences are on private lands and the remaining occurrences are located on Bureau of Land Management lands. Six of these occurrences are old or unconfirmed records needing surveys for current population status. The majority of the populations have between 200-1,000 individuals with some containing over 10,000. There are no known occurrences of *Deinandra floribunda* on National Forest System lands.

Threats

Deinandra floribunda appears to be stable in throughout its range, however, grazing in the sandy washes where plants occur threatens some populations (Reiser 1994). In addition several occurrences are also threatened by subdivision development (California Department of Fish and Game 2002).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Deinandra floribunda*:

- Survey potential habitat on the Descanso Ranger District in Hauser Canyon, Thing Valley, La Posta Creek.

Evaluation of Current Situation and Threats on National Forest Systems Lands

Deinandra floribunda is not currently known from National Forest System lands, but potential habitat exists on the Cleveland National Forest. Threats to possible populations cannot be identified at this time.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the plan area.

Viability Outcomes

Deinandra floribunda is a USDA Region 5 Forest Service Sensitive species. This assures that if *Deinandra floribunda* is ever found on National Forest System lands, any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

No populations of *Deinandra floribunda* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupported assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Deinandra floribunda*.

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Cupressus stephensonii

Deinandra mohavensis

Deinandra mohavensis

Deinandra mohavensis (D.D. Keck) B.G Baldwin (Mojave tarplant)

Management Status

Federal: Forest Service Sensitive

California: Endangered

Heritage Rank: G2; S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Deinandra mohavensis is endemic to the San Bernardino, San Jacinto, and Palomar mountains in San Bernardino, Riverside, and San Diego counties (California Natural Diversity Database 2004). There is also one 1977 record from Baldwin Cross Mountain in Kern County; however, fieldwork is needed to verify this occurrence.

Distribution in the Planning Area

Deinandra mohavensis was rediscovered in the San Jacinto Mountains in 1994 (Sanders and others 1994). There are known occurrences on the San Jacinto Ranger District of the San Bernardino National Forest (SBNF) and on the Cleveland National Forest (CNF). The occurrence on the SBNF is near Fobes Spring in the San Jacinto Mountains. Occurrences on the CNF include Cutca Valley on Baldy Mountain (California Natural Diversity Database 2004). The type locality near Mojave Forks at Deep Creek, the last known historic occurrence prior to rediscovery, may have been extirpated by construction of the dam.

Taxonomy and Natural History

Deinandra mohavensis is a dicotyledon in the sunflower family (*Asteraceae*). This annual herb blooms between July-October. As with many annual species, there may be wide variation in *Deinandra mohavensis* population numbers as a result of year to year differences in rainfall patterns.

Deinandra mohavensis is a 1.5-3 dm in height. The stems are erect, soft-hairy, and sticky-glandular and highly aromatic. The lower leaves are 3-5 cm, oblanceolate, (sub) entire, and bristly. The upper leaves are oblong-oblanceolate and glandular-puberulent. The inflorescence is characterized by sessile heads. The involucre is 4.5-6 mm. The phyllaries are soft-hairy to densely glandular. There are 5 ray flowers. The ligule is approximately 5 mm and yellow. There are six staminate disk flowers, and the corollas and anthers are yellow. Fruit are 2.5-3 mm and beaked. There are 5-9 disk pappus scales that are more or less fused (Keil 1993).

This species was treated as *Hemizonia mohavensis* in *The Jepson Manual* (Keil 1993). However, studies of *Deinandra mojavensis* and related species have determined that the previous generic concept of *Hemizonia* encompassed several morphologically and genetically diverse lineages that should be treated as separate genera (Baldwin 1999). *Deinandra* includes those species with beaked fruits and bright yellow flowers but lacking spine-tipped leaves and bracts. For information on the name change see Baldwin (1999) and Jepson Flora Project (2005).

Habitat Description

Deinandra mohavensis inhabits sandy-gravelly soil in washes and mesic areas of chaparral between 900-1399 m (California Natural Diversity Database 2004; Keil 1993). *Deinandra mohavensis* has been found in association with *Muhlenbergia rigens*, *Adenostoma fasciculatum*, *Ambrosia acanthicarpa*, *Arctostaphylos glauca*, *Eragrostis pectinacea*, *Eriodictyon crassifolium*, and *Eriogonum fasciculatum*.

Occurrence Status

There are 30 occurrences of *Deinandra mohavensis* reported in the California Natural Diversity Database (2004). However, some occurrences are from historical collections and may be extirpated.

The following table shows the recorded occurrences in/near the four southern California National Forests, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Deinandra mohavensis* (Mojave tarplant)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1	10 in 1933	1981	Mojave River, just below confluence w/ Deep Creek, Mojave Desert. On low sand bars in river bed w/ <i>Verbascum thapsus</i> , <i>Mimetanthe pilosa</i> , <i>Hemizonia fitchii</i> , <i>Boisduvalia</i> sp in 1933. Disturbed by flood control modification and intensive ORV activity. No habitat found in 1981. Type locality. Land owner: U.	SBD
2	U	1924	Banning-Idyllwild Road. In clearing in chaparral. Land owner: U.	RIV
3	2450	1995	N slope of San Jacinto Mtns; S side of Twin Pines Rd just W of entrance to Twin Pines Ranch. In sandy/gravelly soil in was along canyon bottom w/ <i>Salix</i> . Chaparral on adjacent slopes. Along Azalea Creek, ca. 0.5 mi. SW of the Twin Ranch Buildings at road crossing just outside the ranch fence. Land owner: U.	RIV
4	1100	1994	N slope of San Jacinto Mtns, along unnamed tributary of Azalea Creek ca. 1 mi. S of the Twin Pines Ranch buildings. Riparian zone w/ <i>Salix</i> in sandy or grassy areas. Chaparral on adjacent slopes. In open, formerly wet areas along drainages, in sand or grassy areas. Land owner: U.	RIV

5	63 in 1994, plus many more from previous year	1994	N slope of San Jacinto Mtns. Twin Pines Creek drainage, Azalea Creek, and rocky gorge of creek. In ash-sycamore riparian habitat along Azalea Creek and chaparral on slopes. 0.7-1.35 mi. SW of Twin Pines Ranch buildings. Land owner: U.	RIV
6	~420	1994	N slope of San Jacinto Mtns. 1 mi. SE of Twin Pines Ranch, along minor gullies between Pines Creek and Dutch Creek. In grassy, formerly wet openings in chaparral. In 2 small gullies on the N side of a dirt track. Land owner: U.	RIV
7	U	1995	N slope of San Jacinto Mtns; Hwy 243, 1 mi. SE of Poppet Flat Rd. In 1995, habitat appeared suitable, but no plants observed. (Collection from 1977). Land owner: U.	RIV
8	at least 300 in 1994	1994	N slope of San Jacinto Mtns; Brown Creek drainage 0.3-0.5 mi. above confluence w/ Twin Pines Creek. Adjacent to dry slopes w/ chaparral dominated by Adenostoma. Plants found in hillside seep beside the old Cabazon-Idyllwild Rd (Hall's Grade) and above and below creek. Land owner: U.	RIV

9	315 in 1994	1994	N slope of San Jacinto Mtns; Twin Pines Creek in vicinity of confluence w/Brown Creek and the dirt road crossing. Riparian zone along sandy/rocky dry creek. Adjacent slopes w/ chaparral dominated by <i>Adenostoma</i> . Land owner: U.	RIV
10	U	1994	San Jacinto Mtns. Beside Hwy 243 near Lawlor (sic?) Lodge, CA. 2 mi. N of Pine Cove. Along roadside in mixed yellow pine and oak forest. Exact location U. Sanders unable to find plant in 1994; habitat may not be suitable. Land owner: U.	RIV
11	> 10,000 in occ. 11, 12	1995	Cutca Valley, along Cutca Trail (FR 1E01). ca. 2.25 mi. E of Eagle Crag summit. In vernal moist areas w/ <i>Muhlenbergia rigens</i> and <i>Juncus</i> sp. CNF.	SD
12	> 10,000 in occ. 11, 12	1995	Along Cutca Trail (FR 1E01). ca. 3.6-4.4 air mi. ENE of Eagle Crag summit. In vernal moist areas w/ <i>Muhlenbergia rigens</i> and <i>Juncus</i> sp. In the Long Creek drainage. CNF.	SD
13	U	1995	Indian Flats Road (Puerta de la Cruz Rd.) just E of Indian Flats, N of Warner Springs. Land owner: U.	SD
14	U	1995	Indian Flats Road (Puerta de la Cruz Rd.) ca. 1 mi. SE of Indian Flats, N of Warner Springs. Land owner: U.	SD

15	U	1995	Indian Flats Road (Puerta de la Cruz Rd.) at entrance to Indian Flats Campground, N of Warner Springs. Land owner: U.	SD
16	U	1995	Chihuahua Valley, NW of Hot Spring Mountain, 0.3 km S of Chihuahua Valley Road on 9S05. Open mesic swale in chaparral. Exact location U. Land owner: U.	SD
17	U	1995	Along road to Hungry Hollow from Hwy 243, E of Poppet Flat, San Jacinto Mountains. Seeps and drainages. Land owner: U.	RIV
18	U	1995	4.2 km S of Chihuahua Valley Rd. on 9S05. Open mesic swale in chaparral. Land owner: U.	SD
19	U	1977	Baldwin Cross Mountain. Originally collected as <i>Hemizonia arida</i> . Needs fieldwork. Land owner: U.	Kern
20	~1000 in 2000	2000	NW slope of Baldy Mountain. 0.5 air mi. NE of Rattlesnake Spring, SW of Mountain Center. Along an ephemeral stream channel. Habitat is burned over forest of chaparral w/ scattered Salix in channel itself. <i>Pinus jeffreyi</i> found on deep alluvium and <i>P. coulteri</i> on N-facing slope. Chamise chaparral on S-facing slope. S of dirt road, along ephemeral unmapped stream channel. Plants found in the channel or on adjacent banks, not on	RIV

			upland alluvial benches or hillsides. Plants scattered in patches of 10-100, totally ~1000. <i>Scutellaria bolanderi</i> ssp. <i>austromontana</i> also occurs at this site. Proposed salvage timber harvest. SBNF.	
21	U	2000	NW Gibbel Flat, 0.9 air mi. SE of Ramona Bowl, Santa Rosa Hills, S of Hemet. In dry ephemeral washes surrounded by coastal sage scrub. Generally occurs in most mesic parts of washes surrounded by <i>Muhlenbergia rigens</i> , etc. East of Cornell? Road N of JCT w/ unnamed dirt road. PVT site proposed for development, but land use plan avoids most direct impacts. Fragmentation, indirect impacts expected.	RIV
22	U	2000	NE Gibbel Flat, 1.3 air mi. ESE of Ramona Bowl, Santa Rosa Hills, S of Hemet. In dry ephemeral washes surrounded by coastal sage scrub. Generally occurs in most mesic parts of washes w/ <i>Muhlenbergia rigens</i> . PVT site proposed for development, but land use plan avoids most direct impacts. Fragmentation, indirect impacts expected.	RIV

23	U	2000	Southern Gibbel Flat, 1.3 air mi. SE of Ramona Bowl, Santa Rosa Hills, S of Hemet. In dry ephemeral washes, surrounded by coastal sage scrub. Generally occurs in most mesic parts of washes w/ <i>Muhlenbergia rigens</i> , etc. PVT site proposed for development, but land use plan avoids most direct impacts. Fragmentation, indirect impacts expected.	RIV
24	U	U	San Jacinto River drainage near McCall Park and Keenwild along Hwy 74. Growing on/in road margins. Exact location U. Land owner: U. Needs fieldwork.	RIV
25	U	U	Hurkey Creek near Hemet Lake in Garner Valley. Exact location U. PVT.	RIV
26	U	U	Off Hwy 243 at Mt. Edna Road. Exact location U. Land owner: U. Needs fieldwork.	RIV
27	< 5 in 2000	2000	E of Fobes Ranch Road, 0.2 air mi. SSE of Fobes Spring, San Jacinto Mtns. Associated w/ <i>Adenostoma fasciculatum</i> , <i>A. sparsifolium</i> , <i>Arctostaphylos</i> spp., <i>Artemisia tridentata</i> , <i>Bromus tectorum</i> , <i>Ceanothus greggii perplexans</i> , etc. Along dirt road. Grazing. Site is a former burned, grazed, and disturbed area of gentle relief near seep. SBNF.	RIV

28	U	2000	<p>McCall Memorial Park, N of Hwy 74, ca. 0.65 air mi. WNW of JCT w/ Hwy 243, San Jacinto Mtns. In open weathered granite among granitic boulders and outcroppings. Associates incl. <i>Adenostoma fasciculatum</i>, <i>Allium haematochiton</i>, <i>Arctostaphylos glauca</i>, Brassica, Bromus, <i>Cercocarpus betuloides</i>, <i>Clarkia</i>, <i>Cryptantha muricata</i>. 2 colonies: N colony along drainage off equestrian trail in former burn area; S colony in park campground. PVT recreation including equestrian use and camping.</p>	RIV
29	U	2000	<p>Along Hwy 74, 1 mi. W of Jct w/ Hwy 243, San Jacinto Mtns. In flat, gravelly soil at base of slope. Associated w/ <i>Adenostoma fasciculatum</i>, <i>Ambrosia acanthicarpa</i>, <i>Arctostaphylos glauca</i>, Bromus, <i>Eragrostis pectinacea</i>, <i>Eriodictyon crassifolium</i>, <i>Eriogonum fasciculatum</i>, <i>Erodium cicutarium</i>. PVT roadside occ.</p>	RIV

30	U	2000	<p>Keen Camp Road, 0.15 mi. SW of Camp Tahitz Meadows, E of Hwy 74, San Jacinto Mtns. On S side of road, on old graded road edge adjacent to chaparral. Associated w/ <i>Arctostaphylos pringlei</i>, <i>Bromus tectorum</i>, <i>Ceanothus cuneatus</i>, <i>Cercocarpus betuloides</i>, <i>Clarkia epilobiodes</i>, <i>Erodium cicutarium</i>, <i>Gnaphalium</i>, <i>Pinus coulteri</i>, <i>Rhamnus californica</i>. Along Keen Camp Road W of entrance to gate w/ Camp Tahquitz Meadows. PVT road maintenance.</p>	RIV
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- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *CNF = Cleveland national Forest*
- *SD = San Diego County*
- *RIV = Riverside County*

Threats

Threats to *Deinandra mohavensis* include vehicle use off of classified roads, grazing, recreational use, and alteration to hydrology. On private land, *Deinandra mohavensis* is also threatened by development and road maintenance.

Conservation Considerations

The following is a list of conservation practices that should be considered for *Deinandra mohavensis*:

- Survey all new occurrences of *Deinandra mohavensis* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Deinandra mohavensis* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Deinandra mohavensis* in the planning area using NRIS data

collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Deinanadra mohavensis is uncommon through out its range. It is threatened primarily by off-road use and lack of fire in decadent chaparral habitat.

Based on this analysis, *Deinandra mohavensis* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Deinandra mohavensis is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Deinandra mohavensis* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Deinandra mohavensis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Deinandra floribunda

**Delphinium hesperium ssp.
cuyamaca**

Delphinium hesperium ssp. cuyamacae

Delphinium hesperium Gray ssp. *cuyamacae* (Abrams) Lewis & Epling (Cuyamaca larkspur)

Management Status

Federal: Forest Service Sensitive

California: Rare

Heritage Rank: G4T2, S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Delphinium hesperium ssp. *cuyamacae*, Cuyamaca larkspur, is endemic to the Peninsular Ranges (Warnock 1993). Approximately 50 large populations occur in the Laguna and Cuyamaca Mountains in San Diego County (Stephenson and Calcarone 1999). Many of the current occurrences are within Cuyamaca Rancho State Park (California Natural Diversity Database 2004). One occurrence is also known from the San Jacinto Mountains in Riverside County.

Distribution in the Planning Area

There are two occurrences of *Delphinium hesperium* ssp. *cuyamacae* on the Cleveland National Forest in the Laguna Mountain Recreation Area (USDA Forest Service 1991; California Natural Diversity Database 2004). The species also occurs adjacent to National Forest System lands at Cuyamaca Lake and King Creek (near Descanso Ranger District) and at Pine Hills and French Valley (near Palomar Ranger District). Another occurrence is reported to have been found on the Cleveland National Forest in 2004 (Winter pers. comm.), but specific information has not been included here to date. One occurrence is reported on the San Jacinto District of the San Bernardino National Forest at the Cahuilla Mountain Research Natural Area (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Delphinium hesperium ssp. *cuyamacae* is one of three subspecies of western or coast larkspur that occur in California (Warnock 1993). Subspecies *cuyamacae* is limited to San Diego and Riverside Counties, while subspecies *hesperium* and *pallescens* have a more northern distribution.

Delphinium hesperium ssp. *cuyamaca* is a perennial herb that over winters as a rootstock. The stems are erect, unbranched, slightly hairy, generally 40-80 cm, and have puberulent stem bases. The upper leaf surface is glabrous; the lower leaf surface is puberulent. The inflorescence has more than 25 light blue to violet flowers with sepals spreading-forward-pointing (Warnock 1993). Rootstocks are long with clusters of fibrous roots (USDA Forest Service 1998). Production of aerial stems appears to vary from year to year depending on the weather. Plants flower from May to July (California Native Plant Society 2001).

Reproductive output of individual plants can be quite high. However, flowering may exhaust food reserves so that a plant does not flower again for a number of years (Bauder 1992). Seeds germinate best when soil is saturated and temperatures are cool. Field observations suggest that germination is extensive but establishment of new individuals rare; if seedlings do survive, growth is slow (Bauder 1992). Individual plants may remain dormant for long periods of time, up to several years, due to their substantial root systems (Bauder 1992). Because of this, annual counts of plants within populations may not be good indicators of population trend, especially if conducted over only a few years. Fire may stimulate expansion of populations (USDA Forest Service 1991).

Habitat Description and Status

On National Forest System lands, *Delphinium hesperium* ssp. *cuyamaca* grows along dry edges of montane meadows and vernal pools (USDA Forest Service 1991). In addition to meadow habitat, this perennial species grows in open shrub lands and appears to be associated with gabbro-derived soils (USDA Forest Service 1998). Other suitable habitat for the *Delphinium hesperium* ssp. *cuyamaca* is sandy soils, saturated during winter months combined with gentle slopes and lack of woody vegetation (Bauder 1992). It is often associated with checkerbloom (*Sidalcea malvaeflora*), California buttercup (*Ranunculus californicus*), bird's-nest thistle (*Cirsium tioganum*), and Cuyamaca meadowfoam (*Limnanthes gracilis* var. *parishii*). In some locations, it is strongly associated with deergrass (*Muhlenbergia rigens*) (Reiser 1994).

Occurrence Status

The California Natural Diversity Database (CNDDB) reports 25 occurrences (California Natural Diversity Database 2004). The majority of the occurrences occur on Rancho Cuyamaca State Park (69%), with a few occurrences on private lands. On National Forest System lands, there are 3 documented occurrences and several areas with potential habitat. A few of these occurrences are old or unconfirmed records that need population status verification.

OCCURRENCE DATA of *Delphinium hesperium* ssp. *cuyamaca* (Cuyamaca Larkspur)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
1	U	U	1901	COAHUILLA VALLEY (CAHUILLA VALLEY).	RIV
2	U	U	1901	THOMAS VALLEY (NOW=GARNER VALLEY OR HEMET VALLEY), SAN JACINTO MOUNTAINS. MAPPING AT CNDDDB IS VERY APPROXIMATE; COULD BE IN MEADOW HABITAT ANYWHERE IN GARNER VALLEY.	RIV
3	U	U	1937	UPPER FRENCH VALLEY, (APPROX 1 MILE NORTHWEST OF PALOMAR MOUNTAIN STATE PARK).	SD
4	U	U	1987	NORTHWEST SHORE OF LAKE CUYAMACA, ALONG HIGHWAY 79 FROM DAM EASTWARD ABOUT 0.5 MILE, CUYAMACA MOUNTAINS. ALONG BOTH SIDES OF HWY 79. SEVERAL COLONIES MAPPED AS ONE POLYGON.	SD
5	U	U	U	WEST SLOPE CUYAMACA PEAK AT HEADWATERS OF KING CREEK, CUYAMACA MOUNTAINS. NEAR CUYAMACA CYPRESS GROVE. EXACT LOCATION NOT KNOWN; MAPPED TO INCLUDE WEST SLOPE OF CUYAMACA PEAK.	SD

6	U	U	1937	PALOMAR MOUNTAIN. EXACT LOCATION NOT KNOWN; MAPPED IN GENERAL VICINITY OF SUMMIT OF PALOMAR MOUNTAIN.	SD
7	U	U	1977	PINE HILLS (APPROX 4 MI SW OF JULIAN).	SD
9	U	U	1983	NORTHWEST OF LAKE CUYAMACA, ABOUT 0.5 MI WNW OF GAGING STATION NEAR DAM, CUYAMACA MOUNTAINS.	SD
10	U	7 in 1999	1999	SOUTHWEST OF LAKE CUYAMACA, LA PUERTA SPRINGS, CUYAMACA RANCHO STATE PARK. NORTH OF MILK RANCH ROAD AND WEST OF MIDDLE PEAK LOOP TRAIL.	SD
11	U	245 in 1999	1999	SOUTH OF LAKE CUYAMACA, NEAR CAMP HUAL-CU-CUISH ALONG WEST SIDE OF HIGHWAY 79, CUYAMACA RANCHO STATE PARK. 3 COLONIES MAPPED WEST OF HIGHWAY AND NORTH OF CAMP HUAL-CU-CUISH AT THE SW END OF LAKE CUYAMACA.	SD

12	U	U	1983	SOUTH OF LAKE CUYAMACA, NORTH OF PASO PICACHO CAMPGROUND ALONG CALIFORNIA RIDING AND HIKING TRAIL, CUYAMCA RANCHO S.P. MAPPED ALONG NORTH SIDE OF TRAIL ABOUT 0.25 MILE WEST OF HIGHWAY 79.	SD
13	U	U	1987	S OF LAKE CUYAMACA, ALONG SOAPSTONE GRADE FROM LOS CABALLOS CAMPGROUND TO LITTLE STONEWALL CREEK, CUYAMACA RANCHO S.P. NUMEROUS COLONIES IN THIS VICINITY. NEED MAP OVERLAY TO FULLY APPRECIATE.	1987
14	U	U	1983	ARROYO SECO, ABOUT 0.7 MILE UPSTREAM FROM SWEETWATER RIVER AND NORTH OF PINE RIDGE, CUYAMACA RANCHO STATE PARK. UPSTREAM FROM GREEN VALLEY AREA CAMPGROUND.	SD

15	U	U	1983	UPPER ARROYO SECO, ABOUT 0.5 MILE SOUTH OF PRIMITIVE CAMP AND NORTH OF PINE RIDGE, RANCHO CUYAMACA STATE PARK. HEAD OF ARROYO AT JUNCTION OF CALIFORNIA RIDING AND HIKING TRAIL AND TRAIL TO GREEN VALLEY AREA CAMPGROUND.	SD
16	U	U	1983	JUST SOUTH OF PRIMITIVE CAMP, BETWEEN PINE RIDGE AND JAPACHA PEAK, CUYAMACA RANCHO STATE PARK. SINGLE COLONY MAPPED ALONG WEST SIDE OF CALIFORNIA RIDING AND HIKING TRAIL, ABOUT 100-150M SOUTH OF SPRING AT PRIMITIVE CAMP.	SD
17	U	U	1983	JUST NORTH OF PRIMITIVE CAMP, BETWEEN PINE RIDGE AND JAPACHA PEAK, CUYAMACA RANCHO STATE PARK.	SD
18	U	5 in 1983	1983	SOUTHERN END OF GREEN VALLEY, NEAR CONFLUENCE WITH JAPACHA CREEK ALONG HIGHWAY 79, CUYAMACA RANCHO STATE PARK. SEVERAL COLONIES MAPPED ALONG BOTH SIDES OF SWEETWATER RIVER; FROM ABOUT 0.1 MI TO 0.6 MIDOWNSTREAM FROM CONFLUENCE WITH	SD

				JAPACHA CREEK.	
19	U	U	1983	SOUTHERN END OF EAST MESA, ABOUT 0.7 MILE SOUTHEAST OF OAKZANITA PEAK, CUYAMACA RANCHO STATE PARK.FOUR COLONIES MAPPED ALONG EAST SIDE OF JEEP TRAIL JUST WEST OF STATE PARK/USFS, T15S/R04E/S10	SD
20	U	U	1983	WEST SIDE OF EAST MESA, ALONG DYAR SPRING FIRE ROAD ABOUT 0.7 MILE SOUTH OF DYAR SPRING, CUYAMACA RANCHO STATE PARK. SINGLE COLONY MAPPED ALONG THE EAST SIDE OF DYAR SPRING FIRE ROAD NEAR JUNCTION WITH ROAD TO EAST MESA FIRE ROAD.	SD
21	U	U	1983	EAST MESA, ALONG EAST MESA FIRE ROAD ABOUT 0.5 MILE NNW OF GRANITE SPRING, CUYAMACA RANCHO STATE PARK. SINGLE COLONY MAPPED ALONG EAST SIDE OF ROAD.,T14S/R04E/S35	SD

22	U	U	1983	EAST MESA, ABOUT 0.25 MI SOUTHWEST OF GRANITE SPRING, CUYAMACA RANCHO STATE PARK. SINGLE COLONY MAPPED ALONG ROAD TO GRANITE SPRING, ABOUT 0.15 MILE EAST OF JUNCTION WITH EAST MESA FIRE ROAD.	SD
23	U	U	1983	EAST OF EAST MESA ALONG UPPER DRAINAGE OF PINE VALLEY CREEK, ABOUT 1 MI NE OF GRANITE SPRING, CUYAMACA RANCHO SP. 5 COLONIES MAPPED ALONG EITHER SIDE OF EAST MESA FIRE ROAD, JUST WEST OF STATE PARK/USFS BOUNDARY, T14S/R04E/S36	SD
24	2-1	350 in 1991, > 2000 in 2004	2004	NORTHEAST SIDE OF SUNRISE HIGHWAY, SOUTHWEST OF GARNET PEAK.FROM GARNET INFO CENTER, CROSS TO THE E SIDE OF HWY AND TRAVEL ON FOOT FOR APPROX 800 FT., T14S/R05E/S28. Laguna Rec. Area / CNF	SD

25	2-2	3-4 in 1992, 12 in June 2004, 1 in July 2004	2004	FILAREE FLAT MEADOW, NORTH OF LUCAS CREEK AND WEST OF SUNRISE HIGHWAY, LAGUNA MOUNTAINS, CLEVELAND NATIONAL FOREST. NORTH END OF MEADOW WITHIN FILAREE ECOLOGICAL ENCLOSURE, NORTH OF OLD DIRT ROAD RUNNING E-W AND ON BORDER OF SAGEBRUSH AND PINES. MAPPED WITHIN THE SW 1/4 NE 1/4 SECTION. Filaree Ecological Enclosure / CNF	SD
26	U	U	U	KENTWOOD-IN-THE-PINES, NEAR WOODLAND DRIVE AND SUNSET DRIVE, EAST OF JULIAN. ALSO ATTRIBUTED TO THIS OCCURRENCE ARE REPORTS FROM "0.5 MILE EAST OF JULIAN HIGH SCHOOL" AND "NEAR WOODLAND DRIVE, KENTWOOD-IN-THE-PINES". EXACT LOCATION NOT KNOWN, BUT INTERSECTION IS WITHIN THE NE 1/4 NE 1/4 OF SECTION 5.	SD
U	U	U	2004	New occurrence located on CNF in 2004. See Kirsten Winter, CNF Forest Biologist, for information to add here	SD
U	U	U	U	Cahuilla Research Natural Area, San Jacinto Mountains, SBNF	RIV

645421 (RSA)	U	U	1995	Laguna Mtns: Milk Ranch Road, vicinity of Middle Peak Fire Road (Hirshberg/RSA)	SD
581818 (RSA)	U	U	1995	Cuyamaca Mountains, east of Cuyamaca Reservoir in meadow north of Pedro Fages Trail marker, ca. 1 mile north of highway S-1 on the California Riding and Hiking trail. Near 33°00'N, 116°30'W. Elevation ca. 1400 meters.(Hirshberg/RSA)	SD

- U = Unknown.
- * = an occurrence number has not been assigned.
- SBNF = San Bernardino National Forest
- CNF = Cleveland National Forest
- RIV = Riverside County
- SD = San Diego County

Threats_

Delphinium hesperium ssp. *cuyamaca* is distributed in a limited number of occurrences in California and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). Its distribution on National Forest System lands is not well understood. Fire may stimulate expansion of populations (USDA Forest Service 1991). Land use that would increase erosion or alter hydrology would threaten the viability of a population (Bauder 1992).

Development of private lands, including development of campgrounds, picnic areas, and housing in the Cuyamaca Lake and Palomar Mountain areas threaten this taxon (USDA Forest Service 1991).

On National Forest lands, threats on the Cleveland National Forest include cattle grazing, dispersed recreation activities, including horseback riding and mountain biking and fuels treatments along roads designated as escape routes. The Filaree Flat population is protected from grazing within an enclosure. As of 2003, known populations appeared to be stable (Stephenson and Calcarone 1999). In 2004 however, accidental impacts created by heavy equipment in occupied habitat during fuel treatment activities affected the largest population on the CNF. This accident may have severely reduced and may have even extirpated this occurrence (Winter pers. comm.). The extent of these impacts were not known as of April 2005. No threats are expected to occur to the San Bernardino National Forest population, as it is located in a Research Natural Area with limited use.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Delphinium hesperium* ssp. *cuyamaca*:

- Implement strategies within the Habitat Management Guide for the sensitive plant species: *Delphinium hesperium* Gray ssp. *cuyamaca* (Abrams) Lewis & Epling, *Lilium parryi* Wats., *Limnanthes gracilis* Howell var. *parishii* (Jeps.) C. Mason, *Poa atropurpurea* Scribn. in riparian montane meadows (USDA Forest Service 1991) to the greatest extent practicable.
- Monitor and maintain enclosure within Filaree Flat meadow.
- Monitor effects from fuels management activities to occupied habitat on east side of the Sunrise Highway near the Garnet Kiosk; restore habitat as necessary.
- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the GIS database.
- Locate occurrence on SBNF in Cahuilla Mountain Research Natural Area, map and collect habitat data, protect as necessary. Collect voucher if plants are numerous.
- Implement strategies in the SBNF Meadow Habitat Management Guide for the SBNF occurrences to the greatest extent practicable.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Avoid all ground disturbing activities within known occurrences or potential habitat.
- Allow wildland fires to freely burn through known occurrences. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. The use of hand line for fuel break construction is preferred.
- Minimize hydrology alterations at known occurrences and potential habitat.
- Survey the occurrences after any prescribed or wildland fire.
- On the CNF, consider updating the Memorandum of Understanding (MOU) that expired in 1999 between the U.S. Fish and Wildlife Service, Helix Water District, Lake Cuyamaca Recreation and Park district, the California Department of Parks and Recreation, and the U.S. Forest Service, which called for signatory land managers to preserve and protect the endangered species and the habitat they depend upon (Helix Water District 1996).

Evaluation of Current Situation and Threats on National Forest System Lands

As of 2003, *Delphinium hesperium* ssp. *cuyamaca* was thought to have low vulnerability on National Forest System lands (Stephenson and Calcarone 1999). The Filaree Flat occurrence contains three plants and is protected from cattle grazing by an enclosure. The other Cleveland NF occurrence which had over 300 plants in 1991 (at last count) and possibly 2000 individuals in 2004 was also considered stable. A proposed prescribed burn planned for this area, was predicted to possibly stimulate the population to expand or to promote stem emergence. However, in the winter of 2004, a fuels treatment that involved tree removal and chipping within the Garnet area was conducted within occupied habitat by mistake. Use of heavy equipment during wet conditions within occupied habitat affected the population and

degraded the habitat. As of April 2005, monitoring of the site has shown no indication that any of the plants survived (Winter pers. comm.).

Recreation activity may also threaten plants; however, rootstocks can remain dormant for up to several years, due to their substantial root systems (Bauder 1992), so the potential impact of recreation activities in habitat is difficult to evaluate. No threats to the San Bernardino occurrence within the Cahuilla RNA are expected.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	B	C	C	B

Delphinium hesperium ssp. cuyamaca is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat will undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

This taxon is included in the SBNF Meadow Habitat Management Guide. The location on the San Bernardino National Forest is protected within the established Cahuilla Mountain Research Natural Area. This location is recommended as the Cahuilla Mountain Wilderness area in Alternatives 3 and 6. It is currently zoned Back Country Non-Motorized in Alternative 1, and would retain this zoning in Alternatives 2, 4 and 4a. Zoning would change to Back Country in Alternative 5. There is a potential for this taxon to be affected by road related activities under Alternative 5 as zoning would change from non-motorized to motorized.

On the Cleveland National Forest, strategies within the habitat management guide for *Delphinium hesperium ssp. cuyamaca* would continue to be implemented under all alternatives. In addition, *Delphinium hesperium ssp. cuyamaca* would benefit across all alternatives from the CNF standard S17, that states: “Within the Laguna Mountain Recreation Area, mountain biking and horseback riding are limited to system roads and trails designated for those uses.” Under Alternatives 2, 3, 4, and 6, *Delphinium hesperium ssp. cuyamaca* would benefit from the designation of Filaree Flat Special Interest Area as Standard 33 would apply: Forest-wide Standard S33 states that within Special Interest

Areas, activities and discretionary uses are either neutral or beneficial for the resource values for which the area was established. Short term adverse impacts to these resource values can be accepted if such impacts will be compensated by the accrual of long-term benefit. The Filaree Flat SIA was not recommended in Alternatives 1, 4a and 5 and this contributed to lower viability outcomes for these alternatives.

All Cleveland National Forest occurrences are located in the Laguna Mountains in the vicinity of Filaree Flat Meadow and just north east in an unnamed wet meadow habitat near the Garnet Keosk. Land use zoning for this location is described below by alternative. Alternative 1, Developed Area Interface; Alternatives 2, 3, 4, 5, and 6, Developed Area Interface and designation of Filaree Flat Special Interest Area (SIA); Alternative 4a, Developed Area Interface and Back Country with no designation of the Filaree Flat SIA.

Viability Outcomes for All Lands within the Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Reiser (1994) states that *Delphinium hesperium* ssp. *cuyamaca* is approaching extinction in San Diego County. He also states that occurrences are affected by recreational activities within Cuyamaca State Park and livestock grazing at Cuyamaca Lake. Development of private lands, including development of campgrounds, picnic areas, and housing in the Cuyamaca Lake and Palomar Mountain areas, also threaten this taxon (USDA Forest Service 1991). Land use that would increase erosion or alter hydrology would also threaten the viability of a population (Bauder 1992). Center for Plant Conservation (2005) also lists road maintenance as a threat.

Of the two occurrences on NFS land analyzed in this assessment, one was recently degraded by heavy equipment and may have been extirpated. Due to the fact that occurrences of this taxon are so limited, the condition of occurrences on NFS land affect outcomes on all lands. Other considerations in predicting outcomes on all lands include the unknown effects of the 2003 Cedar Fire on occurrences within Cuyamaca State Park and that the MOU between the Helix Water District, the USFS and other parties for protection of this taxon expired in 1999.

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Deinandra mohavensis

Delphinium hutchinsoniae

Delphinium hutchinsoniae

Delphinium hutchinsoniae Ewan (Hutchinson's larkspur)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.1 – very threatened (California Natural Diversity Database)

California Native Plant Society (2001) - List 1B; R-E-D Code 3-2-3

General Distribution

Delphinium hutchinsoniae is endemic to coastal Monterey County from the Salinas River south to Gamboa Point, a distance of about 40 miles. It is now known from 14 locations on eight U.S. Geological Survey 7.5-minute quadrangles (California Natural Diversity Database 2004).

Distribution in the Planning Area

Delphinium hutchinsoniae occurs in two areas on the Los Padres National Forest - Pine Ridge Trail east of Pfeiffer-Big Sur State Park and at the Brazil Ranch near Hurricane Point.

Taxonomy and Natural History

Delphinium hutchinsoniae is a perennial herb and a member of the buttercup family (Ranunculaceae). Approximately 30 species of *Delphinium* occur in California, many of them of limited distribution. Hybrids are common when formerly isolated species come into contact in disturbed habitats. No naturally occurring hybrids involving *Delphinium hutchinsoniae* are known, although hybrids have been produced in horticulture (Warnock 1993). *Delphinium hutchinsoniae* is distinguished from other larkspurs by a combination of morphological characters of the root, stem, flower, and seed. *Delphinium hutchinsoniae* blooms from March to June.

Delphinium hutchinsoniae has a restricted distribution and specializes on small, patchily distributed habitats. It is a relatively long-lived perennial species that can reproduce by seed and vegetatively

through division of its roots (Yadon 1997). Epling and Lewis (1952) reported that pollination in *Delphinium* generally occurs through outcrossing though some selfing can occur as well. Bumble bees (*Bombus* spp.) are the primary pollinating agent for larkspurs. Epling and Lewis (1952) also state that larkspurs do not possess effective seed dispersal mechanisms,

"Pollen and seed dispersal of *Delphinium* are generally confined to the immediate vicinity of the parent, that migration of seeds from one colony to another is infrequent or rare, and that the establishment of seedlings is even more rare. We believe accordingly that most colonies are derived from very meager beginnings, perhaps from the establishment of a single seed, and that their variability derives chiefly from this source."

Habitat Description

Yadon (1997) describes habitat for *Delphinium hutchinsoniae* as coastal sage scrub and winter wet grasslands with the following attributes: in openings or rock piles at the foot of a slope or on ridge tops where heavy soils retain higher amounts of moisture. Although plants may be found adjacent to riparian forests and woodlands they are never found in the midst of trees and tall shrubs. Yadon (1997) reports that coastal terrace prairie and sand dunes can also provide habitat for this taxon. Habitat for *Delphinium hutchinsoniae* appears to be naturally scarce and spatially scattered. Natural erosion processes and other disturbance factors such as fire appear to be needed in some areas to help maintain the openings required by *Delphinium hutchinsoniae*. Moss (1989) noted that brush is apparently encroaching upon the occurrence found in Pfeiffer-Big Sur State Park and that off-trail hikers were affecting habitat through the creation of user-generated trails that resulted in trampling of plants and increased rates of erosion. At the same time, Moss noted that this type of disturbance could serve to maintain habitat by reducing the cover of competing vegetation. Yadon (1997) reported that infestations of French broom are threatening the suitability of habitat at this site.

In an account of the Monterey Coastal Habitats (Jones and Stokes 2002) it is stated that: "The primary factors affecting ecosystem processes are recreation activity in the coastal watersheds, livestock grazing, and the invasion of non-native species. Recreation use is high along the lower stream reaches near Highway 1; several developed campgrounds are situated along the Big Sur River, and a trail system extends into upper portions of the drainage."

Thus, it is recognized that the ecosystem that provides habitat for *Delphinium hutchinsoniae* is also affected by two of the same stressors – recreation and nonnative plants (grazing may be affecting undiscovered occurrences of *Delphinium hutchinsoniae*, but this has not been documented on NFS land). This same report also states that: "Nonnative undesirable species are among the greatest threats to the integrity of natural communities in coastal Monterey habitats." On a positive note, the report states that there is little evidence to indicate that the Monterey coastal area is experiencing vegetation changes as a result of shifting fire regimes.

Occurrence Status

Delphinium hutchinsoniae occurs in two areas on the Los Padres National Forest. The first location is at Pine Ridge Trail east of Pfeiffer-Big Sur State Park. At the time of discovery in 1994, there were about 120 plants found in four discrete colonies (Keil 1994). This location has not been revisited since that time. The second location was just discovered (Malengo 2003) on the Brazil Ranch and this occurrence consists of about 50 plants.

Elsewhere, there is one occurrence in Pfeiffer-Big Sur State Park, one occurrence at a Coast Guard installation (last seen in the 1930s), and five occurrences within or partly within Garrapata State Park. The remaining nine occurrences of *Delphinium hutchinsoniae* are on private land. The species has apparently been extirpated at three locations – Hurricane Point, Lafler Canyon and Torre Canyon (Moss 1989, Yadon 1997), possible due in part to overgrazing by livestock on private land.

In 1989, Moss reported finding 51 plants at Pfeiffer-Big Sur State Park. In 1997, a year with exceptionally low February to June rainfall, Yadon found only 17 plants. Yadon reported limiting the intensity of his search effort out of concern that such an effort might damage the scree slope where the plants occur. In this same area, Norman (personal communication 2002) observed "lots" of young and immature plants in the spring of 2002.

The southernmost known occurrence of *Delphinium hutchinsoniae* is found on private land near Gamboa Point (CNDDDB element occurrence No. 14) and is presumed to be extant.

About 1 mile north of Occurrence No. 14 is another station for *Delphinium hutchinsoniae*. This location is also found on private land along a jeep trail (CNDDDB element occurrence No. 4) in the Vicente Creek watershed. In 1982, 50 plants were reported as being present (California Natural Diversity Database 2004).

An occurrence of *Delphinium hutchinsoniae* near the presumed type locality (CNDDDB element occurrence No. 8) is on land now owned by the Big Sur Land Trust. Located in San Jose Canyon, 25 plants were observed here in 1973 (California Natural Diversity Database 2004).

Recent work by Norman (Yadon 1997) resulted in the discovery of three new occurrences of *Delphinium hutchinsoniae* in the area around Pfeiffer Ridge. The number of plants found at these three locations is as follows: CNDDDB element occurrence No. 15 – 6 plants in 1991; CNDDDB element occurrence No. 16 – 10 plants in 1979 and two in 1997; and CNDDDB element occurrence No. 17 – 98 plants in 1997.

At Garrapata State Park, as many as 250 plants were observed as recently as 1989 (California Natural Diversity Database 2004).

Four historical stations on private land (CNDDDB element occurrences Nos. 6, 8, 9, and 11) have not been revisited for 20 years or more (California Natural Diversity Database 2004).

The information contained in this section demonstrates that for the most part, population trends for *Delphinium hutchinsoniae* are unknown. Two occurrences appear to be stable. One occurrence (No. 16) appears to be in decline. However, Yadon (1997) points out that "even though plants were not found one year does not mean that they will not be found the next." This statement is supported by work done by Epling and Lewis (1952) who found that in another species, *Delphinium gypsophilum*, the detectability of individual plants on a site can vary tremendously from year to year with no plants apparent for up to nine years followed by an abundance of flowering individuals in a 'good year'. That dormant plants can remain on a site for a decade or more underscores the need to annually monitor known locations in order to acquire accurate data about the size of any given population.

OCCURRENCE DATA of *Delphinium hutchinsoniae* (Huchinson's larkspur) on National Forest lands, private lands, and other occurrences

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	51 in 1989, 17 in 1997	1997	PINE RIDGE TRAIL, ABOUT 1000 FT PAST STREAM CROSSING NEAR STATE PARK CAMPGROUND, LOS PADRES NATIONAL FOREST. PLANTS FOUND IN 1989 WHERE OPENINGS IN BRUSH HAVE BEEN CREATED BY EITHER PEDESTRIAN FOOT TRAFFIC SHORTCUTTING TO THE CAMPGROUND OR BY DEER ACTIVITY. FOUND ALONG BOTH SIDES OF TRAIL, T19S/R02E/S29	MON
2	U	1977	LAFLEER CANYON ABOVE HIGHWAY 1, WEST OF PARTINGTON RIDGE AND NORTHWEST OF JULIA PFEIFFER BURNS STATE PARK. MAPPED ALONG CANYON JUST EAST OF HIGHWAY, T20S/R02E/S10	MON

3	U	1969	TORRE CANYON ALONG EAST SIDE OF HIGHWAY 1, WEST OF PARTINGTON RIDGE AND NW OF JULIA PFEIFFER BURNS STATE PARK. SITE IS ABOUT 100' SOUTH OF BRIDGE OVER TORRE CANYON AND 5'-10' ABOVE THE HIGHWAY. MAPPED WITHIN THE SW 1/4 NE 1/4 SECTION 14.	MON
4	< 50 in 1982	1997	NORTHEAST OF GAMBOA POINT BETWEEN BIG CREEK AND VICENTE CREEK, ABOUT 0.25 MILE WEST OF HWY 1 AND 25 MI SOUTH OF BIG SUR. TWO COLONIES MAPPED WITHIN THE SE 1/4 SE 1/4 SECTION 36.	MON
6	U	1965	CARMEL HIGHLANDS OPPOSITE (ABOVE) YANKEE POINT, SOUTH OF MONTEREY. IN COASTAL SCRUB WITH ERIOGONUM PARVIFOLIUM, ARTEMISIA, AND LUPINUS ALBIFRONS, T16S/R01W/S35	MON
7	250 in 1989	1997	MALPASO CREEK CANYON, ABOUT 1 TO 1.5 MILES EAST OF HIGHWAY 1, SOUTHEAST OF CARMEL HIGHLANDS. PLANTS FOUND ON NORTH SIDE OF CREEK AND ADJACENT TO THE DIRT ACCESS ROAD. SOME PLANTS WITHIN GARRAPATA STATE PARK BOUNDARY, T17S/R01W/S01	MON

8	25 in 1973	1973	SAN JOSE CANYON, ABOUT 0.5 MILE EAST OF HIGHWAY 1, NORTH OF CARMEL HIGHLANDS. SEVERAL COLLECTIONS FROM THIS AREA. SITE MAPPED NEAR HOUSES UPSTREAM FROM HIGHWAY, BUT HISTORIC COLONIES MAY HAVE RANGED DOWNSTREAM TO MOUTH OF CANYON, T16S/R01W/S25	MON
9	U	U	POINT PINOS NEAR HIGHLANDS, NORTH END OF MONTEREY PENINSULA. MAPPED IN PACIFIC GROVE AT NORTH END OF MONTEREY PENINSULA	MON
11	U	1952	WEST SIDE OF SALINAS RIVER, 0.5 MI SOUTH OF MONTEREY-SALINAS ROAD, WEST OF SPRECKLES.	MON
13	51 in 1989	1989	PFEIFFER-BIG SUR STATE PARK, APPROX 0.2 MILE SOUTH OF WEYLAND CAMP, SOUTH OF BIG SUR. ON EAST SIDE OF PINE RIDGE TRAIL, ABOUT 0.25 MI NORTH OF THE POST CREEK CROSSING. PLANTS IN 3 GROUPS, T19S/R02E/S32	MON
14	U	1997	NORTH OF LOPEZ POINT, ABOUT 0.9 MILE ESE OF HIGHWAY 1 AT VINCINTE CREEK AND 25 MILES SOUTH OF BIG SUR. SINGLE COLONY MAPPED ALONG JEEP TRAIL NEAR THE CENTER OF THE S 1/4 SECTION 6.	MON

15	6 in 1991	1991	CLEAR RIDGE, WEST OF PFEIFFER-BIG SUR STATE PARK, ABOUT 2 MILES SOUTH OF BIG SUR. SOUTH END OF CLEAR RIDGE ON EAST SIDE OF CLEAR RIDGE ROAD. ABOUT 0.5 MILE NORTH OF JUNCTION WITH SYCAMORE CANYON ROAD. MAPPED WITHIN THE NE1/4 NE1/4 SECTION 35.	MON
16	10 in 1979, 2 in 1997	1997	PFEIFFER RIDGE, ABOUT 0.6 MILE SOUTH OF BIG SUR, NORTHWEST OF PFEIFFER-BIG SUR STATE PARK. ON RIDGE ALONG BREWER ROAD, ABOUT 2 MILES FROM JUNCTION WITH HIGHWAY 1. MAPPED ALONG SOUTH SIDE OF ROAD WITHIN THE SE 1/4 SE 1/4 SECTION 23.	MON
17	98 in 1997	1997	DEER RIDGE (COOPER POINT RIDGE) WEST OF CLEAR RIDGE AND 1.6 MILES SW OF BIG SUR, WEST OF PFEIFFER-BIG SUR STATE PARK. MAPPED ABOUT 20'-100' SOUTH OF BOUNDARY FOR ANDREW MOLINA STATE PARK, WITHIN THE SW 1/4 NW 1/4 SECTION 26.	MON
18	Up to 6 in 1980's	1980's / U	ALONG HIGHWAY 1 AT HURRICANE POINT, NORTH OF POINT SUR AND ABOUT 18 MILES SOUTH OF MONTEREY. ON STEEP BANKS ALONG BOTH SIDES OF HIGHWAY AT BEND IN ROADWAY NEAR HURRICANE POINT, T18S/R01E/S19	MON

19	12 in 1960	1960	SOUTHEAST OF SOBERANES POINT AND JUST EAST OF HWY 1, ABOUT 0.4 MILE NORTH OF GRANITE CANYON, SOUTH OF CARMEL HIGHLANDS. MAPPED ABOUT 250 METERS EAST OF HIGHWAY ALONG CREEK/ DRAINAGE BETWEEN GRANITE CANYON AND SOBERANES CREEK, T17S/R01W/S24	MON
20	12	1997	ROCKY RIDGE, BETWEEN MALPASO CREEK AND SOBERANES CREEK, ABOUT 1.25 MILES EAST OF HIGHWAY 1, SE OF CARMEL HIGHLANDS. SINGLE COLONY MAPPED JUST NORTH OF 1843' RIDGE SUMMIT ON TOPO MAP. OTHER PLANTS MAY OCCUR DOWNSLOPE, T17S/R01W/S12	MON
21	12	1997	ROCKY RIDGE, BETWEEN MALPASO CREEK AND SOBERANES CREEK, ABOUT 1.75 MILES EAST OF HIGHWAY 1, SE OF CARMEL HIGHLANDS. SINGLE COLONY MAPPED NEAR THE CENTER OF THE N 1/2 NW 1/4 SECTION 7.	MON

- U = Unknown.
- * = an occurrence number has not been assigned.
- MON = Monterey

Threats

Because of the small size of the populations found on NFS land (less than 120 plants at one location and about 50 plants at the second location) this population has a moderate risk of being extirpated by a combination of recreation impacts and stochastic events. Loss of these populations would result, in combination with the cumulative effects that are occurring on private land, in a moderate risk that this

taxon would trend toward extinction during the next 50 years.

Conservation and Management Considerations

One of the known occurrences of *Delphinium hutchinsoniae* on NFS land consists of four colonies, all of which are located within the Ventana Wilderness. Two of the colonies are within the corridor designated as the Big Sur Wild and Scenic River. The following conservation considerations were developed with these land allocations in mind.

- Use education and interpretation to ensure that hikers remain on the designated Pine Ridge Trail. If monitoring indicates that education and interpretation are not effective in avoiding off-trail impacts consider placement of natural barriers or re-routing of the Pine Ridge Trail to avoid impacts to *Delphinium hutchinsoniae*.
- Use prescribed fire to reduce brush encroachment into occupied habitats and to increase the suitability of unoccupied habitats.
- Use integrated pest management techniques to control or eradicate French broom in areas occupied by *Delphinium hutchinsoniae*.
- The second known occurrence of *Delphinium hutchinsoniae* on NFS land consists of single colony located in an area once subject to livestock grazing. This newly acquired ranch has not been allocated for any uses so at this time it is difficult to predict what the conservation needs of this occurrence may be relative to Forest Service management. There may be a need to practice vegetation management in order to reduce competition from nonnative grasses.

Evaluation of Current Situation and Risks on National Forest System Lands

Delphinium hutchinsoniae is an uncommon narrow endemic species, and the small size of its known occurrences on NFS land results in a potential risk that dispersed recreation could result in adverse impacts to plants and habitat.

Based upon the above analysis *Delphinium hutchinsoniae* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
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B	B	B	B	B	B	B
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Delphinium hutchinsoniae is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat will undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Habitat is of sufficient quality, distribution, and abundance to allow the species population to remain stable or stabilize, but with significant gaps in the historic species distribution on NFS land. These gaps are the result of road and trail construction and cause some limitations in interactions among populations. Current and proposed land use zoning would not vary by alternative; therefore, there is no variance in outcome statements.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

Habitat for *Delphinium hutchinsoniae* has been lost to development in at least one location on private land and two other locations appear to have been degraded by livestock grazing to the extent that these two occurrences are considered to be extirpated. Several other locations on private land are threatened by development. Other populations on private and public lands are small in size and threatened by trampling, erosion, and invasive nonnative plants. Because of these factors and the lack of regulatory protection under state and federal endangered species acts it is likely that one or more occurrences of *Delphinium hutchinsoniae* will become extirpated.

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**Delphinium hesperium ssp.
cuyamaca**

Delphinium inopinum

Delphinium inopinum

Delphinium inopinum (Jeps.) Lewis & Epl. (Unexpected larkspur)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G3 S3.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 1-1-3

General Distribution

Delphinium inopinum is found in the southern Sierra Nevada from Fresno County to Kern County (Warnock 1997, Tanner-Sutton and others 1998). Two occurrences in northern Ventura County are based on historical collections from 1896 and 1946 (CalFlora 2002) and these collections are now believed to be *Delphinium parishii* ssp. *pallidum* (Smith 1998).

Distribution in the Planning Area

Most populations of *Delphinium inopinum* are on the Sequoia and Sierra National Forests (Tanner-Sutton and others 1998). The recorded Ventura County occurrences are on the Los Padres National Forest near Mount Pinos and Frazier Mountain (CalFlora 2000); however, USDA Forest Service botanists have not relocated these occurrences (Tanner-Sutton et al. 1998). The exact location(s) of the Mount Pinos occurrence(s) is uncertain but CalFlora (2002) indicates 1 mile west of Chuchupate Ranger Station and near Goodenough Meadow. As mentioned above, Smith (1998) determined that these plants are *Delphinium parishii* ssp. *pallidum*. Therefore, there are no confirmed occurrences of *Delphinium inopinum* on the national forests of southern California.

Taxonomy and Natural History

Delphinium inopinum is a dicot in the buttercup family (Ranunculaceae). It is often confused with other light-flowered larkspurs, but the massive roots with prominent buds readily distinguish unexpected

larkspur from these other species (Warnock 1997). In the Mount Pinos area *Delphinium inopinum* is reported to grow with *D. parishii*.

Delphinium inopinum is a perennial herb that blooms May–July (California Native Plant Society 2001).

Habitat Description

Delphinium inopinum grows on outcrops of white metamorphic rock on open ridges in pine and red fir forest habitats, generally at elevations of 7,200–9,200 feet (2,200–2,800 meters) (Warnock 1997, Tanner-Sutton and others 1998). On Mount Pinos, habitat is described as exposed, rocky ridgetops (Twisselmann 1995).

Occurrence Status

Thirty-two occurrences have been reported, containing 10–100 plants in the smaller occurrences and hundreds or thousands of plants in the larger occurrences (Tanner-Sutton and others 1998). *Delphinium inopinum* is found in sufficient numbers and distributed widely enough that the potential for extinction is low (California Native Plant Society 2001). Population trends for unexpected larkspur are unknown, but the vulnerability of this species on National Forest System lands appears low (Tanner-Sutton and others 1998, Stephenson and Calcarone 1999).

Threats

On National Forest System lands in the Sierra Nevada, *Delphinium inopinum* faces threats from recreational activities, including off-highway vehicle traffic, and from logging and mining (Tanner-Sutton and others 1998). However, no specific threats have been identified on the Los Padres National Forest, and the reported occurrence on Mt. Pinos is within the Mount Pinos Summit Botanical Area (Stephenson and Calcarone 1999). As previously stated, the plants on Mount Pinos are probably *Delphinium parishii* ssp. *pallidum*.

Conservation and Management Considerations

More information is needed on the taxonomic status of plants found on the Los Padres National Forest.

Evaluation of Current Situation and Threats on National Forest System Lands

Based upon the above analysis *Delphinium inopinum* has been assigned the following threat category:

1. Not found in Plan area.

Viability Outcomes

Delphinium inopinum is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat will undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

No populations of *Delphinium inopinum* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Delphinium inopinum*.

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Delphinium hutchinsoniae

**Delphinium parryi ssp.
purpureum**

Delphinium parryi ssp. purpureum

Delphinium parryi Gray ssp. *purpureum* (Lewis & Epling) Warnock (Mount Pinos larkspur)

Management Status

Federal: None

California: None

Heritage Rank: G4T3, S3.3 – (California Natural Diversity Database)

California Native Plant Society (2001): List 4, R-E-D Code 1-1-3

General Distribution

Delphinium parryi ssp. *purpureum* is known from Kern and Ventura Counties, where it occurs in the Tehachapi Mountains and Western Transverse Ranges (Warnock 1993). No occurrences of this species are recorded in the California Natural Diversity Database (California Natural Diversity Database 2004).

Distribution in the Planning Area

Delphinium parryi ssp. *purpureum* is known to occur on the Los Padres National Forest on Sulphur Springs trail on north side of Zaca Lake, to Salisbury, Pine Corral and Montgomery potreros, Aliso Canyon in Lower Cuyama Valley, upper Sespe Creek, above and below Ozena, and Lockwood Valley (Smith 1998).

Taxonomy and Natural History

Delphinium parryi ssp. *purpureum* is a dicot in the buttercup family (Ranunculaceae). There are five subspecies of *Delphinium parryi*. Mount Pinos larkspur differs from the other subspecies in that the basal leaves are generally present when the plant is in flower (Warnock 1993).

Delphinium parryi ssp. *purpureum* is a perennial herb that flowers May-June (California Native Plant Society 2001).

Habitat Description

Delphinium parryi ssp. *purpureum* grows in the understory of chaparral, Mojavean Desert scrub, and pinyon-juniper woodland communities at elevations of 3,300-8,500 feet (1,000-2,600 meters) (California Native Plant Society 2001).

Occurrence Status

Delphinium parryi ssp. *purpureum* is rare but is found in sufficient numbers and wide enough distribution that the potential for extinction is currently considered to be low. The population trend of this species is unknown (California Native Plant Society 2001).

Threats

On private land this taxon could be threatened by development. No threats have been identified on National Forest System lands.

Conservation and Management Considerations

More information is needed about *Delphinium parryi* ssp. *purpureum*, its specific habitat associations, and the status of populations on National Forest System lands.

Evaluation of Current Situation and Threats on National Forest System Lands

Delphinium parryi ssp. *purpureum* appears to be relatively widespread within its known range with no identified threats on National Forest System lands.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Delphinium parryi* ssp. *purpureum* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Delphinium parryi* ssp. *purpureum* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause

this taxon to suffer a decline in its overall distribution.

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Delphinium inopinum

Delphinium umbraculorum

Delphinium umbraculorum

Delphinium umbraculorum Lewis & Epling (Umbrella larkspur)

Management Status

Federal: Forest Service Watch List; Bureau of Land Management Sensitive

California: None

Heritage Rank: G3, S2S3.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Delphinium umbraculorum is endemic to the Outer South Coast Ranges from Monterey County down through San Luis Obispo and Santa Barbara counties to Ventura County and the western Transverse Range (California Native Plant Society 2001, Warnock 1993).

Distribution in the Planning Area

Delphinium umbraculorum is found on the Los Padres National Forest at about 22 locations (CalFlora 2002) in the eastern Santa Lucia Mountains (CalFlora 2002, Matthews 1997), the San Rafael Mountains, Sierra Madre Ridge, and the Santa Ynez Mountains (CalFlora 2002, Smith 1998). *Delphinium umbraculorum* is also reported from Murieta Canyon near Ojai and Schiedecks in the upper Cuyama River watershed (Smith 1998). In San Luis Obispo County, *Delphinium umbraculorum* is reported (CalFlora 2002) from the west-facing slope of Lopez Canyon and the headwaters of the Arroyo Grande watershed, areas that may be on the Los Padres National Forest.

Taxonomy and Natural History

Delphinium umbraculorum is a dicot in the buttercup family (*Ranunculaceae*). Traits that separate *Delphinium umbraculorum* from the closely related *Delphinium parryi* are green leaves on lower 20 percent of stem in flower and lower stem and petiole glabrous.

Delphinium umbraculorum is a perennial herb that blooms from April to June (California Native Plant Society 2001).

Habitat Description

Delphinium umbraculorum is found in shaded or sunny slopes within cismontane woodland plant communities at an elevation of 340 to 600 meters (California Native Plant Society 2001). In San Luis Obispo County, Hoover (1970) reports that *Delphinium umbraculorum* is frequently found on loose soil derived from disintegrating shale.

Occurrence Status

Population trends for *Delphinium umbraculorum* are unknown. This species was only recently added to the Los Padres National Forest Watch List. Up until that time, the forest had made no effort to track *Delphinium umbraculorum*. The species is not considered endangered at this time (California Native Plant Society 2001).

Threats

No threats to the habitat or distribution and abundance of *Delphinium umbraculorum* have been identified.

Conservation and Management Considerations

More information is needed on the locations and status of Los Padres National Forest occurrences of *Delphinium umbraculorum*.

Evaluation of Current Situation and Threats on National Forest System Lands

Delphinium umbraculorum has a fairly broad range in the inner Coast Ranges of California and is known from at least 22 locations. No threats to the species have been identified.

Based upon the above analysis this species has been assigned the following threat category:

3. Common or widespread in plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Delphinium*

umbraculorum would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Delphinium umbraculorum* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Delphinium parryi ssp.
purpureum**

**Dieteria asteroides var.
lagunensis**

Dieteria asteroides var. lagunensis

Dieteria asteroides Torr. var. *lagunensis* (D. D. Keck) D.R. Morgan & R.L. Hartm. (Mount Laguna aster)

Management Status

Federal: Forest Service Sensitive

California: Rare

Heritage Rank: G5T2T3, S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 2 R-E-D Code 3-3-1

General Distribution

Dieteria asteroides var. *lagunensis*, Mount Laguna aster, is known from the Laguna Mountains in the Peninsular Ranges of San Diego County, California, and from Baja California Norte, Mexico (California Natural Diversity Database 2004, Keil & Brown 1993).

Distribution in the Planning Area

Occurrences of *Dieteria asteroides* var. *lagunensis* comprising an estimated 9,000-10,000 plants, are documented on the Cleveland National Forest and private lands in the Wooded Hill/Laguna Meadow area of Laguna Mountain (Stephenson and Calcarone 1999). These occurrences occupy approximately 5.5 square miles (1,425 hectares), centered near the junction of Sunrise Highway and Morris Ranch Road.

Taxonomy and Natural History

See Jepson Flora Project (2005) for information on the name change from *Machaeranthea asteroides* var. *lagunensis* to *Dieteria asteroides* var. *lagunensis*.

Dieteria asteroides var. *lagunensis* is a perennial herb that generally flowers July – August (California Native Plant Society 2001).

Middle cauline leaves of *M. asteroides* var. *lagunensis* are generally 2-5 mm wide, entire or obscurely toothed. The involucre of the inflorescence is widely obconic to hemispheric. The phyllary tips are 1-3 mm, acute to short acuminate. A similar variety, *M. asteroides* var. *asteroides*, occurs in the eastern Sonora Desert near the Colorado River to southwest New Mexico and into Mexico. *M. asteroides* var. *lagunensis* is distinguished from *M. asteroides* var. *asteroides* by its geographical range, shorter phyllary tips, and the shape of its involucre (Keil & Brown 1993).

Habitat Description

M. asteroides var. *lagunensis* occurs in scattered openings in black oak/Jeffrey pine forest at elevations of 2,600-7,900 feet (800-2,400 meters) (Keil & Brown 1993, Stephenson and Calcarone 1999). In Baja California Norte, the plant grows in chaparral and associated desert regions on sandy or gravelly soils (Stephenson and Calcarone 1999).

Occurrence Status

California Natural Diversity Database (CNDDDB) records for *Dieteria asteroides* var. *lagunensis* reflect only two occurrences, one on the Cleveland National Forest and the other on property of unknown ownership. Of these occurrences, the population located off Forest is questionable, formerly determined to be *Aster teprodes*, and observed once in 1948. In the late 1980's, approximately 100 occurrences of *Dieteria asteroides* var. *lagunensis* were mapped and recorded as separate populations in the Laguna Mountains to protect the plants from disturbance during proposed timber stand improvement activities (Kopp pers. comm.). The California Natural Diversity Data Base combined these population records into one occurrence record (#3) for the Cleveland National Forest. Sites range from presence of a single plant to over 2000 individuals (California Natural Diversity Database 2004; Cleveland National Forest records).

Although *Dieteria asteroides* var. *lagunensis* is distributed in highly restricted occurrences and is considered to be endangered throughout its range in California (California Native Plant Society 2001), it is considered to have low vulnerability on National Forest System lands (Stephenson and Calcarone 1999). Populations are more abundant in Baja California, Mexico (California Native Plant Society 2001) and are currently considered to be stable on National Forest System lands (Stephenson and Calcarone 1999).

OCCURRENCE DATA of *Dieteria asteroides* var. *lagunensis* (Mount Laguna aster) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County

3	2-1	20	1987	Wooded Hill/CNF	SD
*	2-2	U	1979	Wooded Hill/CNF	SD
*	2-3	U	1979	Wooded Hill/CNF	SD
3	2-4	100+	1987	Mount Laguna / CNF	SD
*	2-5	U	1979	Wooded Hill/CNF	SD
3	2-6	200	1987	Wooded Hill Area / CNF	SD
3	2-7	10	1987	Wooded Hill Area / CNF	SD
3	2-8	30	1988	Wooded Hill Area / CNF	SD
3	2-9	50-100	1987	Wooded Hill Area / CNF	SD
3	2-10	25	1987	Wooded Hill Area / CNF	SD
3	2-11	200	1987	Wooded Hill Area / CNF	SD
3	2-12	30	1987	Wooded Hill Area / CNF	SD
3	2-13	1	1987	Wooded Hill Area / CNF	SD
3	2-14	200+	1987	Wooded Hill Area / CNF	SD

3	2-15	200	1987	Wooded Hill Area / CNF	SD
3	2-16	75-100	1987	Wooded Hill Area / CNF	SD
3	2-17	20	1987	Wooded Hill Area / CNF	SD
3	2-18	23	1987	Wooded Hill Area / CNF	SD
3	2-19	10	1987	Wooded Hill Area / CNF	SD
3	2-20	50	1987	Wooded Hill Area / CNF	SD
3	2-21	25	1987	Wooded Hill Area / CNF	SD
3	2-22	10-20	1987	Wooded Hill Area / CNF	SD
3	2-23	50	1987	Wooded Hill Area / CNF	SD
3	2-24	1	1987	Wooded Hill Area / CNF	SD
3	2-25	10	1987	Wooded Hill Area / CNF	SD
3	2-26	20	1987	Wooded Hill Area / CNF	SD
3	2-27	50-100	1987	Wooded Hill Area / CNF	SD

3	2-28	6	1987	Wooded Hill Area / CNF	SD
3	2-29	10	1987	Wooded Hill Area / CNF	SD
3	2-30	200	1987	Wooded Hill Area / CNF	SD
3	2-31	50-75	1987	Wooded Hill Area / CNF	SD
3	2-32	10	1987	Wooded Hill Area / CNF	SD
3	2-33	15	1987	Wooded Hill Area / CNF	SD
3	2-34	25	1987	Wooded Hill Area / CNF	SD
3	2-35	10	1987	Wooded Hill Area / CNF	SD
3	2-36	10	1987	Wooded Hill Area / CNF	SD
3	2-37	4	1987	Wooded Hill Area / CNF	SD
3	2-38	16	1987	Wooded Hill Area / CNF	SD
3	2-39	2	1987	Wooded Hill Area / CNF	SD
3	2-40	14	1987	Wooded Hill Area / CNF	SD

3	2-41	7	1987	Wooded Hill Area / CNF	SD
3	2-42	3	1987	Wooded Hill Area / CNF	SD
3	2-43	50	1987	Wooded Hill Area / CNF	SD
3	2-44	8	1988	Wooded Hill Area / CNF	SD
3	2-45	27	1988	Wooded Hill Area / CNF	SD
3	2-46	14	1988	Wooded Hill Area / CNF	SD
3	2-47	5	1988	Wooded Hill Area / CNF	SD
3	2-48	40	1988	Wooded Hill Area / CNF	SD
3	2-49	54	1988	Wooded Hill Area / CNF	SD
3	2-50	2	1988	Wooded Hill Area / CNF	SD
3	2-51	45	1988	Wooded Hill Area / CNF	SD
3	2-52	10	1988	Wooded Hill Area / CNF	SD
3	2-53	2	1988	Wooded Hill Area / CNF	SD

3	2-54	8	1988	Wooded Hill Area / CNF	SD
3	2-55	1	1988	Wooded Hill Area / CNF	SD
3	2-56	18	1988	Wooded Hill Area / CNF	SD
3	2-57	85	1988	Wooded Hill Area / CNF	SD
3	2-58	33	1988	Wooded Hill Area / CNF	SD
3	2-59	1	1988	Wooded Hill Area / CNF	SD
3	2-60	33	1988	Wooded Hill Area / CNF	SD
3	2-61	30	1988	Wooded Hill Area / CNF	SD
3	2-62	35	1988	Wooded Hill Area / CNF	SD
3	2-63	2000	1988	Wooded Hill Area / CNF	SD
3	2-64	500	1988	Wooded Hill Area / CNF	SD
3	2-65	10	1988	Wooded Hill Area / CNF	SD
3	2-66	4	1988	Wooded Hill Area / CNF	SD

3	2-67	8	1988	Wooded Hill Area / CNF	SD
3	2-68	2	1988	Wooded Hill Area / CNF	SD
3	2-69	50	1988	Wooded Hill Area / CNF	SD
3	2-70	27	1988	Wooded Hill Area / CNF	SD
3	2-71	49	1988	Wooded Hill Area / CNF	SD
3	2-72	21	1988	Wooded Hill Area / CNF	SD
3	2-73	40	1988	Wooded Hill Area / CNF	SD
3	2-74	18	1988	Wooded Hill Area / CNF	SD
3	2-75	300	1988	Wooded Hill Area / CNF	SD
3	2-76	28	1988	Wooded Hill Area / CNF	SD
3	2-77	10	1988	Wooded Hill Area / CNF	SD
3	2-78	100	1988	Wooded Hill Area / CNF	SD
3	2-79	43	1988	Wooded Hill Area / CNF	SD

3	2-80	10	1988	Wooded Hill Area / CNF	SD
3	2-81	34	1988	Wooded Hill Area / CNF	SD
3	2-82	7	1988	Wooded Hill Area / CNF	SD
3	2-83	5	1988	Wooded Hill Area / CNF	SD
3	2-84	80	1988	Wooded Hill Area / CNF	SD
3	2-85	55	1988	Wooded Hill Area / CNF	SD
3	2-86	160	1988	Wooded Hill Area / CNF	SD
3	2-87	7	1988	Wooded Hill Area / CNF	SD
3	2-88	200	1988	Wooded Hill Area / CNF	SD
3	2-89	50	1988	Wooded Hill Area / CNF	SD
3	2-90	3	1988	Wooded Hill Area / CNF	SD
3	2-91	250	1988	Wooded Hill Area / CNF	SD
3	2-92	16	1988	Wooded Hill Area / CNF	SD

3	2-93	38	1988	Wooded Hill Area / CNF	SD
3	2-94	150	1988	Wooded Hill Area / CNF	SD
3	2-95	50	1988	Wooded Hill Area / CNF	SD
3	2-96	200	1988	Wooded Hill Area / CNF	SD
3	2-97	4	1988	Wooded Hill Area / CNF	SD
3	2-98	1500+	1988	Wooded Hill Area / CNF	SD
3	2-99	30	1988	Wooded Hill Area / CNF	SD
3	2-100	200	1988	Wooded Hill Area / CNF	SD
3	2-101	3	1988	Wooded Hill Area / CNF	SD
3	2-104	20	1988	Wooded Hill Area / CNF	SD
3	2-105	37	1989	Wooded Hill Area / CNF	SD

- U = Unknown.
- * = an occurrence number has not been assigned.
- CNF = Cleveland National Forest
- SD = San Diego County

Threats

Livestock grazing occurs in a portion of the taxon's known habitat. Monitoring to determine the effects of grazing was proposed for the Wooded Hill area, and a grazing exclosure was placed at the site, but results so far have been inconclusive (Stephenson and Calcarone 1999). Grazing during fall months appears to be the most detrimental to regeneration of *Dieteria asteroides* var. *lagunensis*. A large number of plants also occur on lands managed under special use permit for the San Diego State University Observatory. Plants within the permitted area appear to respond favorably to the low level of ground disturbance created by raking soils annually to remove pine and oak litter for fire hazard reduction (Kopp pers. comm.). Several plants that occur amongst recreational cabins under special use permit also appear to be minimally affected by cabin use or annual leaf litter raking.

Plants have also been documented as occurring on lands maintained beneath an aerial powerline under special use permit. Plants are present along the Sunrise Highway, where the use of salt during the winter months to melt road ice puts this taxon and other native plants at risk from salt accumulation in the soil. Unauthorized vehicle use has occurred in occupied habitat, and one small area along Morris Ranch Road was fenced in 1986 to prevent disturbance from recreation activities (Stephenson and Calcarone 1999, USDA Forest Service 1992). Impacts associated with increased recreational activities and construction of mountain cabins on private lands pose additional threats to *Dieteria asteroides* var. *lagunensis* populations (Reiser 1994).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Dieteria asteroides* var. *lagunensis*:

- Implement strategies in the Laguna aster (*Machaeranthera asteroides* var. *lagunensis*) species management guide (USDA Forest Service 1992).
- Monitor known populations in areas where livestock grazing occurs.
- Monitor populations near Forest system roads and trails.
- Maintain the genetic diversity of the species by protecting all known populations on Federal lands.
- Avoid actions associated with salt accumulation in native soils.
- Halt unauthorized vehicle use in habitat known to support this species.

Evaluation of Current Situation and Threats on National Forest System Lands

The known distribution of *Dieteria asteroides* var. *lagunensis* in California appears to be restricted to a small area in the vicinity of Laguna Meadows, with the center of the populations found near the junction of Morris Ranch Road and Sunrise Highway, on the Cleveland National Forest. Forest Service activities within habitat include both dispersed and developed recreation, timber stand improvement and regeneration, grazing, special use permit administration, and road maintenance. Occupied habitat is also within proposed Wildland Urban Interface defense and threat zones. Unauthorized off-road driving has occurred as well. This taxon seems to be somewhat disturbance adapted, as it appears in the openings

created by road and utility line maintenance and by the clearing of pines and diseased trees (California Natural Diversity Database. 2002). Thus recreation activities may create openings that benefit the plants by providing opportunities for seedling establishment, in addition to having direct negative impacts when plants are crushed. This taxon also appears to respond favorably to broadcast burning, although changes in plant density after fire have not been fully determined (Stephenson and Calcarone 1999). Potential effects from grazing are not known at this time. Populations of *Dieteria asteroides* var. *lagunensis* appear to be stable on National Forest System lands at this time. However, increases in authorized or unauthorized recreation activities could have substantial impacts to this taxon. Since the majority of the occupied habitat for this species occurs on the Cleveland National Forest, protection of this habitat will rely on Forest management.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon narrow endemic with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Dieteria asteroides var. *lagunensis* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

A species management guide for this species was completed in 1992 (USDA Forest Service 1992), and actions to protect habitat were implemented. The guide would remain in effect as a strategy to utilize under all alternatives.

Under Alternatives 1, 2, 3 and 4, land use zoning in *Dieteria asteroides* var. *lagunensis* habitat would be a combination of Developed Area Interface, Back Country Non-Motorized and Back Country. Habitat under Alternative 4a would be zoned as above with small amount of Back Country Motorized Use Restricted replacing some of the Developed Area Interface and Back Country zoning. Under Alternative 5, habitat would be zoned as under Alternatives 1,2 and 4 except that the existing Back Country Non-Motorized zoning would become motorized as it is changed to Back Country. Under Alternatives 3 and 6, land use zoning would be a combination of Developed Area Interface, Back Country Non-Motorized and Back Country. Under Alternative 6, a small portion of Critical Biological land use zone on the

south end of the Laguna Meadow near Los Rosales would protect habitat into the future. Grazing would also be curtailed within this zone providing an opportunity to study the effects of grazed versus non-grazed occurrences under natural conditions. Other locations under Alternative 6 not within the Critical Biological zone may also be affected by a potential decrease in the acres of lands suitable for grazing. Effects cannot be predicted until the effects of grazing are known.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	D	C

Vulnerability of *Dieteria asteroides* var. *lagunensis* throughout its range is considered to be low (Stephenson and Calcarone 1999). Populations are abundant in Baja California, Mexico however there is little guarantee they would remain that way over the long term. The Mexico and Laguna Mountain occurrences do not occur adjacent to one another so the potential for interactions amongst populations is low. The occurrences at Laguna Mountain are currently stable as plants continue to persist and regenerate with recreation and grazing pressures. Protection of plants in the United States would depend on management of habitat on the Cleveland National Forest and those few possible occurrences on private land within the Laguna Recreation Area.

By maintaining the current distribution of *Dieteria asteroides* var. *lagunensis* on National Forest System lands through similar land use zoning in Alternatives, 1-4a and 6, only the land use zoning and alternative emphasis in Alternative 5 could contribute cumulative effects that would cause the species to suffer a decline in its overall distribution from FS activities. The change within occupied habitat from the current non-motorized zoning to motorized in Alternative 5 and the alternative emphasis combined with the uncertainty of the future management of the occurrences on private land within the Laguna Recreation Area and those in Mexico also contribute to predicted outcomes for All Lands.

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Personal Communication

Kopp, Deveree. District Botanist, USDA Forest Service, San Bernardino National Forest. [Telephone conversation with Jan Beyers]. 28 September 2003.

Delphinium umbraculorum

**Dieteria canescens var.
ziegleri**

Dieteria canescens var. ziegleri

Dieteria canescens (Pursh) Nutt. var. *ziegleri* (Munz) D.R. Morgan & R.L. Hartm. (Ziegler's aster)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T1; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Dieteria canescens var. *ziegleri* is endemic to the Santa Rosa Mountains of Riverside County in southern California.

Distribution in the Planning Area

Two occurrences of *Dieteria canescens* var. *ziegleri* are known in the San Bernardino National Forest in the area of Santa Rosa Mountain (California Natural Diversity Database 2004). A portion of these occurrences may occur on private lands. Both occurrences are along roads and in somewhat disturbed clearings (California Natural Diversity Database 2004). Another occurrence vouchered by Munz in 1952 is from Vandeventer Flat east to Santa Rosa Mountain. Vandeventer Flat is located on the Santa Rosa Indian Reservation however the lands to the east toward Santa Rosa Peak are NFS lands. Munz also collected it near Santa Rosa Peak in 1938 at 6800 feet. Ziegler collected it in 1969 on the north slope of the Santa Rosa Mts. at 6500-7500 feet. Both of these locations could be on NFS lands however private lands are present on the NE side of Santa Rosa Mountain. The majority of these occurrences appear to be on NFS lands east of Vandeventer Flats to the east side of Santa Rosa Mountain. Sanders collected vouchers in the Garner Valley area of the San Bernardino National Forest also. It is unknown if the Wear collection (1996) in Garner Valley is on NFS lands.

Taxonomy and Natural History

See Jepson Flora Project (2005) for information on the name change from *Machaeranthea canescens*

var. *ziegleri* to *Dieteria canescens* var. *ziegleri*.

Dieteria canescens var. *ziegleri* is a dicotyledonous plant in the sunflower family (Asteraceae). Five varieties of *D. canescens* are recognized; the other four are common and occur in a variety of habitats throughout California. Of the five varieties, only var. *ziegleri* is a long-lived perennial or subshrub; it is further distinguished by its larger flower heads (Keil & Brown 1993).

Dieteria canescens is less than 12 dm, generally canescent-puberulent, and often glandular. The stems are generally branched above and more or less bushy. The leaves are generally 3-10 cm, generally 2-6 mm wide, linear to obovate, subentire to dentate or minutely serrate. The lower leaves are tapered, and the upper are sometimes clasping. The inflorescence consists of radiate heads with phyllaries generally in a 3-10 series with tips that are short triangular to elongate, acuminate, and spreading to bent backward. The phyllaries are generally more or less glandular or glabrous. There are many rayflowers (except in var. *shastensis*), the corollas are blue-purple, and the ligules are 1-2 cm. There are many disk flowers with corollas 5.5-8 mm. Fruit are 2.5-3.5 mm, narrowly obovate, weakly curved and more or less flattened with 5-7 mm ribs on each face, and glabrous or more or less silky. The pappus is 6-8 mm (Keil & Brown 1993).

Dieteria canescens var. *ziegleri* is distinguished by its lifeform as a long-lived perennial or subshrub. It has stems that are 1-5 dm that are spreading or erect. The branches are loosely spreading to ascending. Inflorescence heads are radiate, 12-20 mm, 15-20 mm wide (when pressed), and have involucre that are 14-15 mm. Ray flowers are fertile with a well developed style. *Dieteria canescens* var. *ziegleri* flowers July-September (California Native Plant Society 2001, Keil & Brown 1993).

Habitat Description

Dieteria canescens var. *ziegleri* grows in the understory of small montane coniferous forest stands at elevations of 4,500–8,200 feet (1,400–2,470 meters) on dry ridges, along roadsides, and in slightly disturbed clearings (California Natural Diversity Database 2004; USDA Forest Service 2002). Both occurrences are located near roads and campsites. *Dieteria canescens* var. *ziegleri* may have some tolerance to ground disturbance.

Dieteria canescens var. *ziegleri* is associated with *Pinus jeffreyi*, *Quercus agrifolia*, and *Eriogonum wrightii*.

Occurrence Status

There is no information on population size or trends for the known occurrences of *Dieteria canescens* var. *ziegleri*.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Dieteria canescens* var. *ziegleri* (Ziegler's aster)

Occurrence No. (CNDDDB, RSA, UCR)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1977	Santa Rosa Mountain summit and west slope. Grows on dry ridges scattered under pines, along roadsides and in dry, somewhat disturbed clearings. Associates include <i>Eriogonum wrightii</i> , <i>Pinus jeffreyi</i> , and <i>Quercus agrifolia</i> . Along Road 7S02 and disturbed sites from Stump Spring to 0.5 air mi. SW of Santa Rosa Spring Campground. Off-road vehicles may threaten this occurrence. T 7S, R5E N ¼ section 27, also in sections 22 and 28. SBNF.	SBD
3	U	1970	Santa Rosa Mountain, along road to Santa Rosa Mountain. Grows on dry ridges scattered under pines, along roadsides in dry, somewhat disturbed clearings. Occasional off-road vehicle use. SBNF.	SBD
78306 (RSA)	U	1952	Vandeventer Flat east to Santa Rosa Mountain. Munz/RSA Santa Rose Indian Reservation and SBNF lands.	SBD
259193 (RSA)	U	1938	near Santa Rosa Peak at 6800 feet. Munz/RSA	SBD

*	*	1969	north slope of the Santa Rosa Mts. at 6500-7500 feet. Ziegler/RSA	SBD
111531 (UCR)	U	1998	San Jacinto Mts., Pine Meadow along Hwy 74 in Garner Valley (eastern), 1 mi. NW of Hwy 371 jct. To Anza, T7S/R4E/S33, USFS land. (Sanders/UCR)	RIV
26092 (UCR)	U	1946	Santa Rosa Mountain, Lat:33 ° 32'33"N/Lon:116 ° 27'38"W / elev. 7900 ft.(Roos/UCR)	RIV
106356 (UCR)	U	1996	San Jacinto Mts., upper end of Garner Valley, T7S/R4E/S8 (Wear/UCR)	RIV
20178 (UCR)	U	1977	Santa Rosa Mt., along FS Rd. 7S02,T5E/R7S/S28 (Derby/UCR)	RIV
13885 (UCR)	U	1973	Santa Rosa Mts., Stump Spring, elev. 7700 ft. Lat: 33 ° 32'15"N/ Lon:116 ° 26W	RIV
58304 (UCR)	U	1989	Santa Rosa Mts., N slope of Thomas Mt., 1 mi. SW of Hwy 74 on Thomas Mtn. Rd., 4920 ft. Lat:33 ° 39'00"N / Lon:116 ° 41'52"W (Helmkamp/UCR)	RIV

- U = Unknown
- * = an occurrence number has not been assigned
- SBNF = San Bernardino National Forest
- SBD = San Bernardino County
- RSA= Rancho Santa Ana Botanic Garden Herbarium
- UCR= University of California Riverside Herbarium

Threats

Unauthorized off road driving may threaten occurrences. In addition, high levels of disturbance from trampling, road grading, and livestock grazing may pose risks to the taxon (California Natural Diversity Database 2002). The extremely narrow distribution makes this taxon susceptible to stochastic extinction.

Conservation and Management Considerations

The USDA Forest Service is actively trying to acquire more land with potential habitat for this taxon, although very little potential habitat exists outside of its known distribution, as the Santa Rosa Mountains are surrounded by desert vegetation (USDA Forest Service 2002).

The following list of conservation practices should be considered for *Dieteria canescens* var. *ziegleri*:

- Survey all new occurrences of *Dieteria canescens* var. *ziegleri* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Dieteria canescens* var. *ziegleri* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Dieteria canescens* var. *ziegleri* in the planning area using SBNF data collection standards, and incorporate these occurrences into the GIS database.

Evaluation of Current Situation and Threats on National Forest System Lands

Dieteria canescens var. *ziegleri* is endemic to the Santa Rosa Mountains of Riverside County. A limited number of occurrences have been documented from within a seven mile range. Plants occurring near roads and campgrounds may be affected by recreational activities that occur within these areas and/or by road and developed site maintenance. Unauthorized off road driving may also affect occurrences and habitat. CNDDDB records for this species have not been updated for 26 years, so true threats to this species remain known, and the level of ground disturbance this plant can tolerate is also unknown.

Based on what is known about this species distribution and habitat associations, and considering the threat inherent in poor knowledge, *Dieteria canescens* var. *ziegleri* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	B	A

Dieteria canescens var. *ziegleri* is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Under Alternative 1, open-structure habitats in general, and *Dieteria canescens* var. *ziegleri* in particular, would continue to be at risk from unauthorized vehicle travel off Forest Transportation System roads and trails.

For the Santa Rosa Mountain occurrences, the alternatives are zoned as follows:

Alternatives 1, 2, 4, and 5, Back Country; Alternative 3, Back Country and Back Country Non-Motorized and Recommended wilderness; Alternative 4a, Back Country and Back Country Non-Motorized; Alternative 6, Back Country Non-Motorized.

For the Garner Valley occurrences the alternatives are zoned as follows: Alternative 1, Developed Area Intermix and Back Country; Alternative 2, Back Country; Alternative 3, Back Country, Back Country Non-Motorized, recommendation for the Garner Valley SIA, and recommended wilderness; Alternative 4, Back Country; Alternative 4a, Back Country and Back Country Non-Motorized; Alternative 5, Back Country; and Alternative 6, Back Country, Back Country Non-Motorized and recommendation of the Garner Valley SIA.

Predicted outcomes by alternative are based on observations that this species can tolerate some level of ground disturbance and the reviewer's knowledge from observations of ground disturbance tolerance with similar taxa (*Dieteria canescens* var. *canescens* and *Deiteria asteroides* var. *lagunensis*).

Viability Outcome for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	B	C	C	C	B

Dieteria canescens var. *ziegleri* occurs on the Santa Rosa Indian Reservation and on private lands on the east side of Santa Rosa Mountain. The status of occurrences and potential threats at these locations are

unknown. Viability may depend upon management on NFS lands. By maintaining the current distribution of *Dieteria canescens* var. *ziegleri* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Dieteria canescens* var. *ziegleri* to suffer a decline in its overall distribution.

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Dieteria asteroides var.
lagunensis

Dodecahema leptoceras

Dodecahema leptoceras

Dodecahema leptoceras (A. Gray) Rev. & Hardham (Slender-horned spineflower)

Management Status

Federal: Endangered (52 Federal Register 36270, USDI Fish and Wildlife Service September 28, 1987)

California: Endangered (California Natural Diversity Database)

Heritage Rank: G1, S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

There is no Critical Habitat designated or proposed for this taxon.

General Distribution

Dodecahema leptoceras, slender-horned spineflower, is endemic to alluvial systems on the coastal side of the Transverse and Peninsular Ranges in Los Angeles, Riverside, and San Bernardino counties. It occurs along the southern margins of the San Gabriel, San Bernardino, and San Jacinto mountains, from Bee Canyon in the north, to the Santa Ana River Wash, Bautista Canyon, and Vail Lake in the south (Gordon-Reedy 1997; USDI Fish and Wildlife Service 2001). Other occurrences are on the east side of the Santa Ana Mountains in Riverside County and at Arroyo Seco and Temescal Creeks in San Diego County (Stephenson and Calcarone 1999).

Distribution in the Planning Area

Dodecahema leptocera occurs at two locations on National Forest System lands: in Bautista Canyon on the San Bernardino Forest, and near Dripping Springs Campground on the Cleveland National Forest (USDI Fish and Wildlife Service 2001). The Bautista Canyon occurrence contained 1,000 plants in 1999 and is monitored annually (California Natural Diversity Database 2004). The Dripping Springs populations were discovered in the late 1980s and are located in the Arroyo Seco drainage near the USFS Dripping Springs Fire Station and Campground, with additional occurrences on private lands (USDA Forest Service 1989; Gordon-Reedy 1997). They are significant for being the largest populations known, containing tens of thousands of plants (Gordon-Reedy 1997; USDI Fish and

Wildlife Service 2001).

Taxonomy and Natural History

Dodecahema leptoceras is low-growing annual producing a slender taproot. Plants are spreading prostrate dichotomously branched stems of 3-10 cm across, but may be several times larger after fire (USDA Forest Service 1998). The leaves are basal, 1-6 cm long, linear oblanceolate and glabrous. The inflorescence is 1-5 dm in diameter with 1 bract per node. Bracts are 3-6 mm and 3-lobed. The involucre is 2-4 mm long, cylindrical, and glandular. Involucres lobes have 6 (2-3 mm long) awns at the tips and 6 (1-2 mm long) awns at the base. There are 3 flowers per involucre. Flowers are 1.2-2 mm long, white to pink, hairy, 6-lobed, and with 9 stamens. Plants flower from April to June (California Native Plant Society 2001).

The abundance of *Dodecahema leptoceras* changes greatly from year to year in response to timing and amount of rainfall (USDI Fish and Wildlife Service 2001). Too-frequent fires are considered to adversely affect *Dodecahema leptoceras* habitat; however, increased vigor and seed-set has been observed after fire in some populations (USDI Fish and Wildlife Service 2001).

This species was formerly assigned to *Centrostegia* and *Chorizanthe*, but is now placed in the monospecific genus *Dodecahema* (Reveal and Hardham 1989), distinguished by the unique morphology of its involucre. The genus is named for the 12 spines on the involucre: six hooked spines at the base and six straight spines of unequal length at the end of each lobe (Reveal and Hardham 1989; Hickman 1993). *Dodecahema leptoceras* was federally listed as *Centrostegia leptoceras* (USDI Fish and Wildlife Service 1987).

Habitat Description

Dodecahema leptoceras grows on sandy soils of alluvial fans and sandy stream terraces within chaparral, cismontane woodland, and coastal sage scrub at elevations of 650–2,500 feet (200–760 meters) (California Native Plant Society 2001). Most occurrences are on flood-deposited river terraces associated with later successional stages of alluvial scrub habitat, typically with scrub oak (*Quercus berberidifolia*), coast live oak (*Q. agrifolia*), chamise (*Adenostoma fasciculatum*) and buckwheat (*Eriogonum fasciculatum*); however, some of the Vail Lake populations occur in upland chaparral habitat and on dry drainages (USDA Forest Service 1989; Gordon-Reedy 1997). *Dodecahema leptoceras* has never been recorded on new alluvial deposits or on recently disturbed ground, nor is it found on sites with dense growth of introduced annual grasses (USDA Forest Service 1989; USDI Fish and Wildlife Service 2001), suggesting that the plant is tolerant of low-nutrient substrates and intolerant of competition. In the Santa Ana River wash, *Dodecahema leptoceras* occurs with another federally listed plant, Santa Ana River woollystar (*Eriastrum densifolium* ssp. *sanctorum*).

Occurrence Status

The California Natural Diversity Database lists 22 extant occurrences of this species (California Natural Diversity Database 2002). Over half of the occurrences are on lands of private or unknown ownership (63%). A few of these occurrences on private land are old, unconfirmed records needing current population status verification. The remaining occurrences are on protected lands of varied ownership (Cleveland National Forest, Angeles National Forest, San Bernardino National Forest, Riverside County, and Bureau of Land Management). The occurrences at Vail Lake on private lands and the Cleveland National Forest occurrences constitute the southernmost and largest known population, with 19,000 plants counted in 1990 (Gordon-Reedy 1997), and 13,000 in 1995 (California Natural Diversity Database 2002). The Bautista Canyon occurrences on the San Bernardino National Forest are much smaller, with around 1,000 plants estimated in 1999 (California Natural Diversity Database 2002).

Extensive surveys conducted on the Angeles, Cleveland, and San Bernardino National Forests in 1991 failed to discover additional populations (USDI Fish and Wildlife Service 2001).

OCCURRENCE DATA of *Dodecahema leptoceras* (Slender-horned spineflower) on National Forest lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
1	*	500	1999	ABOUT 1.5 MILE EAST OF VALLE VISTA, NORTH OF HIGHWAY 74, OPPOSITE SCHULTZ DRIVE, SOUTH OF SAN JACINTO RIVER. EASTERN MWD	RIV
2	*	30	1999	EAST HIGHLANDS, WHERE HIGHWAY 30 CROSSES WASH OF SANTA ANA RIVER. BLM-ESCONDIDO RA	SBD
3	*	100	1984	CAJON CREEK WASH, BEHIND FIRE STATION, AT DEVORE. PVT	SBD

16	*	50	1991	TEMESCAL CANYON, INDIAN WASH AT DE PALMA ROAD NEAR GLEN EDEN NUDIST COLONY. PVT	RIV
18	*	10	1984	CAJON PASS; CAJON CANYON NEAR DEVORE, NORTH OF EXISTING GLEN HELEN CAMPGROUND AREA. POSSIBLY EXTIRPATED. SBD COUNTY	SBD
22	*	1100+	1992	UPPER SANTA ANA WASH; EAST OF CHURCH STREET. MAPPED WITHIN THE NE 1/4 OF THE SW 1/4 OF SECTION 11. SBD VALLEY MUTUAL WATER CO	SBD
24	*	3635	1990	KOLB CREEK DRAINAGE, SOUTH OF VAIL LAKE. PVT	SBD
25	*	106	1990	VAIL LAKE VICINITY; ARROYO SECO DRAINAGE, NORTH OF HWY 79 AND SOUTH OF VAIL LAKE. DEVELOPMENT MAY THREATEN IN FUTURE (PROPOSED RESERVOIR EXPANSION). PVT	RIV

27	*	1000+	1993	BEE CANYON WASH TRIBUTARY OF THE SANTA CLARA RIVER, NORTH OF SOLEDAD CANYON ROAD AND LANG R.R. SIDING. THREATENED BY 1200 UNIT MOBILE DEVELOPMENT AND HIGHWAY REALIGNMENT. ILLEGAL DUMPING ALSO A PROBLEM.PVT	LAX
28	*	86	1990	ABOUT 200 FT. S OF ROAD BETWEEN VAIL LAKE MARINA AND CAMPGROUND, ABOUT 0.5 MI SW OF MARINA, 0.75 MI N OF HWY 79. PVT?	RIV
29	*	U	1989	DRIPPING SPRINGS, WEST OF AGUANGA. PVT	RIV
30	*	102	1992	SANTA ANA RIVER WASH; APPROX 0.9 MI ESE OF LA CARRERA FIELD, 0.95 MI N OF PIONEER AVE. PVT	SBD
31	*	95	1990	1.3 MI E OF LA CARRERA FIELD, 1.0 MI N OF PIONEER AVE. SANTA ANA RIVER WASH.	SBD
32	*	650	1990	1.7 MI E OF LA CARRERA FIELD, 1 MI N OF PIONEER AVE. SANTA ANA RIVER WASH.	SBD

33	*	350	1990	APPROX 2.6 MI E OF HWY 30, N OF MUNICIPAL AIRPORT AND JUST E OF OLD RAILROAD GRADE. 0.7 MI N OF TERMINUS OF WABASH AVE.	SBD
34	*	1000+	1990	1.0 MI S OF GREENSPOT RD, 0.5 MI E OF OLD RAILROAD GRADE. SANTA ANA RIVER WASH. INTRODUCED ANNUALS THREATEN.	SBD
35	*	100	1993	LYTLE CREEK, NORTHWEST OF DEVORE ROAD. FLOOD CONTROL DIST	SBD
37	*	U	1979	WEST FORK SAN GABRIEL RIVER, SAN GABRIEL MOUNTAINS. NEAR COGSWELL RESERVOIR.	LAX
23	2-1	1500	1989	S. of Dripping Springs Campground / CNF	RIV
23	2-2	700	1989	S. of Dripping Springs Campground / CNF	RIV
23	2-3	300	1989	S. of Dripping Springs Campground / CNF	RIV
26	2-4, 2-5	5700 100	1989 1991	N. of Dripping Springs Campground / CNF	RIV
7	*	1577	1997	Big Tujunga Wash / private NOT on ANF	LA

17	*	1000	1999	Bautista Canyon Creek / SBNF	RIV
21	*	500-900	1999	Bautista Canyon Creek / SBNF	RIV

- *U = Unknown.*
- ** = an occurrence number has not been assigned.*
- *SBNF = San Bernardino National Forest,*
- *ANF = Angeles National Forest,*
- *CNF = Cleveland National Forest,*
- *RIV = Riverside County,*
- *SBD = San Bernardino County,*
- *LA = Los Angeles County*

Threats

Populations of *Dodecahema leptoceras* on private lands are threatened by development and non-native species invasions, dumping, off highway vehicle (OHV) use, flood control practices, illegal mining, homeless encampments, development, erosion, shooting, and other recreation activities.

On The Cleveland National Forest, plants occurring near recreation areas at Dripping Springs Campground were threatened by trampling from recreation users. This habitat upstream from the trail out of Dripping Springs Campground was fenced and signed in 1999 and no adverse effects have been recorded since then. During 67 monitoring visits to determine the effectiveness of conservation measures only one trespass incident was recorded from 2001 through 2004 at the Dripping Springs fence. In addition, seasonal closure of the campground to protect arroyo toads was expected to add protection for *Dodecahema leptoceras* during flowering and seed-set (USDI Fish and Wildlife Service 2001). It is possible that effects could occur to this population over time with the continued use of this adjacent Campground and trails. Coordination with Southern California Edison regarding power line access near the Dripping springs occurrence has resulted in knowledge of the sensitivity of this habitat and no effects from this use have been observed. The Cleveland National Forest continues to utilize recommendations in the Interim Management Prescription for *Dodecahema leptoceras* (USDA Forest Service 1989) when planning projects or managing ongoing activities.

On the San Bernardino National Forest, OHV activities, erosion, unauthorized target shooting, and bulldozing for flood control have threatened occurrences in Bautista Canyon. In the 1990's this area was closed to target shooting and fenced resulting in a higher level of protection from disturbance (USDI Fish and Wildlife Service 2001). These populations continue to be monitored by SBNF botanists and appear to be in good condition; however some level of unauthorized use continues to affect habitat (Kramer, Loe pers. comm.) to discourage unauthorized shooting, trash is removed and the area is patrolled.

There are also threats to the habitat type where these plants occur. In the vicinity of the occurrences, but not directly upon them, presence of unauthorized camping and use of campfires at the motorcycle crossing in Bautista Creek increases the risk of wildfire and the reburning of habitat that has recently burned (Loe pers. comm.). An increase in the fire rotation interval of this habitat has the potential to type convert vegetation to annual nonnative grassland. Wildfires in this location also increase the risk that plant occurrences would be affected by heavy equipment used for fire suppression efforts in emergency situations prior to knowledge that an endangered species is present. Efforts to eliminate effects from bulldozing for flood control have been completed; however this still remains a potential threat. The Bautista Canyon highway improvement project, mentioned in previous documents as a potential threat to habitat no longer threatens this occurrence as the environmental analysis for this project was cancelled in 2005 (Kramer pers. comm.).

No occurrences on NFS lands burned in the 2003 wildfires however there is the potential that they may have all been affected during January 2005 flood events. Effects from flooding remain unknown at the time of this analysis as it is too early to survey for this annual taxon.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Dodecahema leptoceras*:

- Monitor (and repair as needed) Forest fences at Dripping Springs Campground and Bautista Canyon.
- Monitor all species occurrences and habitat in the Cleveland and San Bernardino National Forests. Manage threats; revise occurrence information and the Sensitive Plant Atlas as necessary.
- Apply the habitat suitability criteria and detection protocol developed for this taxon to surveys at the project level.
- Survey modeled habitat.
- Survey modeled habitat in spring of 2004-2005 within City Creek Drainage burned in the 2003 Bridge Fire on the San Bernardino National Forest.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Allow wildland fires to freely burn through occurrences. However, protect from short fire intervals through occurrences. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. Use ridgelines or base of mountains for fuel break construction. The use of hand line for fuel break construction is preferred (USDA Forest Service 1991).
- Do not develop additional trails near known occurrences.
- Use general watershed management to benefit populations of *Dodecahema leptoceras* downstream of National Forest System lands by protecting the integrity of the natural hydrology and fluvial geomorphology.
- Implement actions to protect this species using the conservation strategy for coastal sage scrub as

applicable.

- Monitor occupied habitat for the introduction on invasive non-native plants. Treat by pulling.
- On the Cleveland National Forest, implement strategies in the "Interim Management Prescription for *Dodecahema leptoceras* (USDA Forest Service 1989) to the greatest extent practicable.
- When completed, compile results of the 2005 modeled habitat surveys performed by Rancho Santa Ana Botanic Garden botanists within modeled habitat within the 2003 Grand Prix and Old fires on the SBNF.
- Update GIS database with modeled habitat found to be suitable or not suitable.

Evaluation of Current Situation and Threats on National Forest Systems Lands

Dodecahema leptoceras is considered to have moderate vulnerability on the Cleveland National Forest and high vulnerability on the San Bernardino National Forest (Stephenson and Calcarone 1999). Populations of *Dodecahema leptoceras* on National Forest System lands are well documented, and measures have been implemented to provide protection from human disturbance where needed.

On the Cleveland National Forest, populations in the Agua Tibia Wilderness Area and are protected from most ground-disturbing activities and seasonal closure of the Dripping Springs Campground provides additional protection during flowering and seed set. However, use of the campground and designated trails will continue to promote use of the area, and active site management of the occurrences will continue to be needed over the long term.

On the San Bernardino National Forest, closure of the area to target shooting and fencing of occurrences has also reduced effects. However, the area is popular for dispersed recreation and unauthorized activity is high. Direct effects from unauthorized target shooting to one occurrence have occurred over the last several years (Kramer pers. comm.). Potential for type conversion of recently burned habitat to nonnative annual grass is high due to potential for wildfires to ignite from unauthorized campfire use occurring in the vicinity (Loe, pers. comm.) Fires in this location also increase the risk that occurrences and habitat would be affected by heavy equipment utilized for fire suppression efforts. Effects to occurrences from flooding in 2005 are not known.

An Interim Management Prescription is used to protect *Dodecahema leptoceras* on the Cleveland National Forest (USDA Forest Service 1989). This species is included in a conservation strategy for coastal sage scrub (USDA Forest Service and others 1997). General watershed management will benefit populations of *Dodecahema leptoceras* on National Forest System lands by protecting the integrity of the natural hydrology and fluvial geomorphology (U.S. Fish and Wildlife Service 2001).

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome on National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	A	C	A

Dodecahema leptoceras is listed as Endangered under the Endangered Species Act of 1973, as amended, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the U.S. Fish and Wildlife Service.

Predicted outcomes are based on the continued use of strategies outlined in the Interim Management Prescription for *Dodecahema leptoceras* on the Cleveland National Forest (USDA Forest Service 1989), the conservation strategy for coastal sage scrub (USDA Forest Service and others 1997), and protection of the integrity of the natural hydrology and fluvial geomorphology through watershed management National Forest System lands (U.S. Fish and Wildlife Service 2001) through use of Forest-wide riparian standards. In Alternatives 2-6, use of CNF standard S15 that restricts activities that may disturb *Dodecahema leptoceras* was also used in predicting outcomes. In all alternatives except 1 and 5, Bautista Creek would be eligible as a Wild and Scenic River. Under this status, the area would be managed as such until a suitability analysis is completed. If suitable, dams would not be placed within the river and the river's free-flowing characteristics would be maintained. This management which encompasses 65 acres of occupied habitat on the SBNF would protect the integrity of the natural hydrology and fluvial geomorphology.

On the Cleveland National Forest, both *Dodecahema leptoceras* populations (4 acres) are located in the existing Agua Tibia Wilderness and are protected from most ground-disturbing activities. This area would remain wilderness under all alternatives. Under Alternative 1, current management would be retained. In alternatives 3, 4a and 6, both *Dodecahema leptoceras* populations would be located within a Critical Biological land use zone, assuring that protection of species-at-risk from recreation impacts would be a priority (also 4 acres but it is trumped by wilderness designation on maps).

Dodecahema leptoceras populations within Bautista Canyon on the San Bernardino National Forest would be managed in a Back Country land use zone under alternatives 1, 2, 4 and 5. This would maintain current levels of access to the plant occurrences and the potential for unauthorized activities to damage plants. The greater emphasis on motorized recreation under alternative 5 would likely increase use of the area and increase the potential for unauthorized activities. Additional OHV trails could be developed under this alternative; although they would not be located directly through occupied *Dodecahema leptoceras* habitat, the increased access could lead to more accidental fire starts and the potential for habitat degradation.

Under Alternative 3, Bautista Canyon is recommended both as Wilderness, except for the immediate highway corridor, and as a Critical Biological zone (39 acres occupied habitat) with the Hixon Bautista motorized trail crossing retained outside of the Critical biological zone. This would result in decreased use of the area and increased efforts to protect the taxon.

Under alternative 4a, at least 39 acres of occupied habitat would be protected within the Bautista Canyon Critical Biological zone with the Hixon Bautista motorized trail crossing retained outside of the Critical biological zone (as in alternative 3).

Under Alternative 6, a Critical Biological zone is proposed for Bautista Canyon that includes relocation of the Hixon Bautista trail crossing, and adjacent portions of the canyon would be managed under the Back Country Non-Motorized zone except for the immediate highway corridor. Removal of the motorized trail would reduce use of the area, and consequent unauthorized activities, even further than under Alternative 3.

On both the CNF and SBNF, Alternatives 3, 4a and 6 would provide the highest protection for *Dodecahema leptoceras* with the Critical Biological zoning.

Viability Outcomes for All lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	B	C	B	C	B

Dodecahema leptoceras is distributed in highly restricted occurrences and is considered to be at risk of extirpation throughout its range (California Native Plant Society 2001). Occurrences on private lands are threatened by loss of habitat to increasing urbanization and flood control projects (California Native Plant Society 2001, Hickman 1993, Stephenson and Calcarone 1999, U.S. Fish and Wildlife Service 2001). *Dodecahema leptoceras* does not appear to tolerate ground-disturbing activities or competition from nonnative annual grasses (California Natural Diversity Database 2004, U.S. Fish and Wildlife Service 2001). The plant is consequently highly vulnerable to habitat-altering activities such as gravel mining, trash dumping, and off-highway vehicle use (California Native Plant Society 2001, Hickman 1993, Stephenson and Calcarone 1999, U.S. Fish and Wildlife Service 2001).

This species is included in a conservation strategy for coastal sage scrub (USDA Forest Service and others 1997). General watershed management will benefit populations of *Dodecahema leptoceras* downstream of National Forest System lands by protecting the integrity of the natural hydrology and fluvial geomorphology (U.S. Fish and Wildlife Service 2001). Because approximately 63% of

occurrences are in private ownership, where they may be lost to land development, protection of the few occurrences on National Forest System land may play an important role in sustaining the species. Most of the remaining occurrences on private land are targeted for acquisition as preserve land under the Riverside County Multiple Species Habitat Conservation Plan (Dudek & Associates, Inc. 2003). However, the size and density of populations on National Forest System lands may also be important in determining the range of genetic variation remaining within the species. The likelihood of an improved outcome for the species under alternatives 3, 4a and 6 could affect the overall status of *Dodecahema leptoceras* over the long term.

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Personal communications

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**Dieteria canescens var.
ziegleri**

**Downingia concolor var.
brevior**

Downingia concolor var. brevior

Downingia concolor Greene var. *brevior* McVaugh (Cuyamaca Lake downingia)

Management Status

Federal: None

California: Endangered (California Natural Diversity Database)

Heritage Rank: G4T1, S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Downingia concolor var. *brevior*, Cuyamaca Lake downingia, is endemic to the Cuyamaca Lake area in the Peninsular Ranges of San Diego County.

Distribution in the Planning Area

There are no documented occurrences of *Downingia concolor* var. *brevior* on National Forest System lands. However, this species has the potential to occur on the Cleveland National Forest (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Downingia concolor var. *brevior* is an annual herb in the bellflower family (Campanulaceae) that generally flowers May-July (California Native Plant Society 2001). Corolla is 7-13 mm, glabrous except for the upper lobes that are ciliate-scabrous. The lateral sinuses are more or less equal or with the upper being greater. Lower lip is blue with central white field including one purple and 4-sided spot at the base. The lower lobes are abruptly toothed and obovate to obtuse in shape. Anthers are included in the corolla tube. Fruits are 12-25 mm and soon dehiscent, with translucent lines (Ayers 1993).

Two varieties of *Downingia concolor* are recognized: var. *concolor* and var. *brevior*. Populations of var. *brevior* are widely disjunct from the nearest occurrences of var. *concolor*, which are in Monterey County. Var. *brevior* is also distinguished morphologically from var. *concolor* by its smaller fruits (Ayers 1993).

Distribution and population sizes of *Downingia concolor* var. *brevior* within its habitat area fluctuate greatly from year to year. Seeds of *Downingia* species are known to float, so changing water levels in Cuyamaca Lake from year to year could help explain the variation in distribution (Bauder 1992). Seeds of *Downingia concolor* var. *brevior* germinate best at cool temperatures (8 to 10°C) in the light under laboratory conditions. Seeds floating in water at higher temperature (23.5°C) remained viable and were capable of germination later when transferred to cooler temperatures (Bauder 1992). These experiments indicate that *Downingia concolor* var. *brevior* is adapted to germinate in late winter/early spring, when soil and water temperatures are cool. Seedlings were observed to remain in an arrested state of development while floating up to a year, and did not resume growth until in contact with saturated soil. This suggests that some factor present in soil cues the seedlings to begin growth, so that they do not start growth in deep water (Bauder 1992). Experiments testing plant tolerance to inundation found that seedlings of *Downingia concolor* var. *brevior* periods. Plants inundated for 2 weeks and 8 weeks produced the same number of flowers by 4 weeks after emergence from the water, but plants that were never inundated had nearly twice as many flowers (Bauder 1992).

Habitat Description

Downingia concolor var. *brevior* is found on the periphery of Cuyamaca Lake, an artificial reservoir. This habitat has been described as a montane variation of coastal vernal pools, with very moist soils in spring that dry out by late summer (Reiser 1994). *Downingia concolor* var. *brevior* is found around the lake at elevations of 4,600–4,900 feet (1,400–1,500 meters) (California Native Plant Society 2001). It occurs on mudflats exposed by receding waters of the lake, as well as in drainages that enter the valley (Bauder 1992). The most common associates of *Downingia concolor* var. *brevior* are *Navarretia intertexta* and *Plagiobothrys* cf. *ancanthocarpus*, two other annual forb species (Bauder 1994).

Occurrence Status

Downingia concolor var. *brevior* is known from just seven occurrences (California Native Plant Society 2001). Three occurrences are listed in the California Natural Diversity Database (CNDDDB) (California Natural Diversity Database 2004). Two of these are on private lands with one presumed extant and the other presumed extirpated. The third CNDDDB Occurrence no. 4 is on state owned land at Rancho Cuyamaca State Park. In addition, fifteen records are documented in the CalFlora database, all from the Cuyamaca Lake area (CalFlora 2002), presumably the same as CNDDDB Occurrence no. 4. An estimated 80% of the known remaining populations of *Downingia concolor* var. *brevior* occur on land owned or managed by the Helix Water District and the Lake Cuyamaca Recreation and Park District. All known populations collectively occupy less than 200 acres (81 hectares); however, populations fluctuate based on annual rainfall, winter flooding, and temperature (Stephenson and Calcarone 1999). There are no occurrences known on National Forest System lands.

Threats

Downingia concolor var. *brevior* was in decline, primarily as a result of overgrazing (Stephenson and Calcarone 1999); however, after cattle were removed from meadows north of the lake, an estimated several thousand plants flowered in 1988 (a drought year) (Bauder 1992, Reiser 1994). In 1991 the same area was submerged under water that collected from spring rainfall. Subsequent populations could be negatively affected if the lake level is allowed to remain high for consecutive years (Reiser 1994). Attempts have been made to restore proper hydrologic function to meadow areas in Cuyamaca Rancho State Park and to introduce *Downingia concolor* var. *brevior* back into these restored habitats (Bauder 1994).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Downingia concolor* var. *brevior*:

- *Downingia concolor* var. *brevior* was included in a time limited conservation agreement between the USDI Fish and Wildlife Service, the California Department of Fish and Game, the California Department of Parks and Recreation, the USDA Forest Service, the Lake Cuyamaca Recreation and Park District, and the Helix Water District (Stephenson and Calcarone 1999). Consider the need to renew this agreement.
- Survey potential habitat (vernal pool or very moist areas near Cuyamaca Lake) on the Cleveland National Forest.

Evaluation of Current Situation and Threats on National Forest Systems Lands

There are no documented occurrences on National Forest System lands for *Downingia concolor* var. *brevior*. Potential habitat on the Cleveland National Forest should be surveyed for presence of this taxon. If it is found, proper riparian or wetland management of the habitat could help conserve *Downingia concolor* var. *brevior*.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

There are no documented occurrences on National Forest System lands for *Downingia concolor* var. *brevior*. *Downingia concolor* var. *brevior* only has potential habitat on National Forest System lands. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Downingia concolor* var. *brevior*.

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Dodecahema leptoceras

Draba corrugata var. saxosa

Draba corrugata var. saxosa

Draba corrugata S. Watson var. *saxosa* (Davidson) Munz & I.M. Johnston (Rock draba)

Management Status

Federal: None

California: None

Heritage Rank: G2T2; S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Draba corrugata var. *saxosa* is known only from the San Jacinto and Santa Rosa Mountains in Riverside County (California Native Plant Society 2001). The California Natural Diversity Database (2004) reports four occurrences of this taxon. White (2001) lists occurrences of *Draba corrugata* on Tahquitz Peak and the summit of Mt. San Jacinto, but does not specify which variety is present.

Distribution in the Planning Area

Draba corrugata var. *saxosa* is known on the on the San Bernardino National Forest at Toro Peak (occ. no. 1) and at Tahquitz Peak (USDA Forest Service 2003). This taxon is present on lands adjacent to the San Bernardino National Forest in San Jacinto State Park on the peak of Mt. San Jacinto (California Natural Diversity Database 2004, White 2001)

Taxonomy and Natural History

Draba corrugata var. *saxosa* is a dicotyledon and a member of the mustard family (Brassicaceae). This taxon is a biennial to perennial herb that blooms June–September (California Native Plant Society 2001, Price 1993). The original description is in *Bulletin of the Southern California Academy of Sciences* 19 (1):11 (1920), revised nomenclature is in *Bulletin of the Torrey Botanical Club* 49(12): 352 (1922), and taxonomic treatment is in *University of Washington Publications in Biology* 11:33 (1941) (California Native Plant Society 2001). *Draba corrugata* var. *saxosa* is distinguished from *D. corrugata* var. *corrugata* by having simple, rather than branched, stems and few, uncrowded cauline leaves (Price

1993).

Draba corrugata is characterized as a biennial to perennial herb. There are one to several stems from the base, which are under 25 cm. The stems have coarse hairs that are simple and forked. The leaves have coarse, simple and forked hairs. The basal leaves are oblanceolate, entire, and grayish and are arranged in dense cushion-like rosettes that are 10-30 mm. There are 0-15 cauline leaves. There are 10-100 or more flowers. The flowers have yellow petals that are 3-5 mm. Fruit are 5-20 mm, (1.5)2–3(4) mm wide, elliptic, and generally twisted. The fruit have an acute tip and may or may not have simple, forked, and stellate hairs. The style is 1.5-3.5 mm. There are fewer than 35 seeds. The seeds are 1.2-1.6 mm and lack wings (Price 1993).

Draba corrugata var. *saxosa* is distinguished by the following characteristics: The stems are generally simple. The 0-3 cauline leaves are not crowded. Fruit are sparsely clustered (Price 1993).

Habitat Description

Draba corrugata var. *saxosa* occurs at elevations of 8,000–11,500 feet and inhabits alpine boulder and rock fields, subalpine coniferous forests, and upper montane coniferous forests in rocky areas (California Native Plant Society 2001). Munz (1974) lists habitat for *Draba corrugata* var. *saxosa* as dry slopes in montane coniferous forest.

Alpine plants are vulnerable to trampling by hikers and other forms of ground disturbance (Billings 1988), but these impacts are limited to a small number of locations around developed recreation areas, roads, and trails. Trampling and other ground disturbances resulting from hiking, rock climbing, camping, and road building have removed or degraded some areas of alpine and subalpine plants. In general, however, alpine and subalpine ecosystems are considered to be largely intact, stable, and little disturbed with the exception of some heavy recreation use in the immediate vicinity of trails. (USDA Forest Service 2003)

Occurrence Status

There are five known occurrences of *Draba corrugata* var. *saxosa*; however, four of these are based on historical collections. Fieldwork is needed to relocate historical occurrences and determine their status.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Draba corrugata* var. *saxosa* (Rock draba)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1993 2003	Toro Peak. Collections from 'E of Toro Peak', 'Saddle between Santa Rosa Peak and Toro Peak,' and 'Ridge 1 mi. NW of Toro Peak' also attributed to this site. RSA botanists surveyed N and NW slopes and did not relocate occurrence in 2003. SBNF.	RIV
2	U	1932	Summit of San Jacinto Peak. Among rocks; granite ledges. Needs fieldwork. DFG, DPR (San Jacinto Mountain State Park).	RIV
3	U	1921	Tamarack Valley, San Jacinto Mountains. Collection from 'sandy flay, 1 mi. below Round Valley' also attributed to this site. Needs fieldwork. DFG, DPR.	RIV
4	U	1937	Between Hidden Lake and Round Valley, San Jacinto Mountains. On shaded slope. Needs fieldwork. DFG, DPR.	RIV
* (RSA)	U	1938	East of Toro Peak, Santa Rosa Mtns. 8000'. Land owner: U.	RIV
* (RSA)	U	1937	Forest near Hidden Lake, San Jacinto Mtns. Land owner: U.	RIV
* (RSA)	U 4	1931 2003	Tahquitz Peak, San Jacinto Mtns. 8600'. San Jacinto Wilderness. RSA relocated 4 plants in 2003. SBNF	RIV

- U = Unknown

- * = an occurrence number has not been assigned
- SBNF = San Bernardino National Forest
- RIV = Riverside County

Threats

Plants on Tahquitz Peak were observed in rock outcropping above the trail in the San Jacinto Wilderness Area. No invasive non-native species were observed. The population vitality and vigor was rated "marginal", potential for habitat to recover from disturbances, long term prospect for continued existence, defensibility from human factors, and overall occurrence ranking was "good" (USDA Forest Service 2003).

A large area of habitat was surveyed on National Forest System land at Toro Peak (occ. no .1) in 2003 with negative results, however the potential for habitat to recover from disturbances was rated "good" (USDA Forest Service 2003). It was noted that there was OHV use along Forest Road 7S02, that the road is gated below and the peak is developed and disturbed with facilities/towers. *Bromus tectorum* was present and trees were cut. At this time there are no indications that these activities are specific threats to the *Draba corrugata* var. *saxosa*. *Draba corrugata* var. *saxosa* occurrences on State Park land are protected from most high impact human-caused disturbances.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Draba corrugata* var. *saxosa*:

- Survey all new occurrences of *Draba corrugata* var. *saxosa* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Draba corrugata* var. *saxosa* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Draba corrugata* var. *saxosa* in the planning area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and threats on National Forest System

Draba corrugata var. *saxosa* is a very narrow endemic species restricted to the San Jacinto and Santa Rosa Mountains. It occurs within the San Jacinto Wilderness and the San Jacinto State Park with little known and/or measurable disturbances. *Draba corrugata* var. *saxosa* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level. By maintaining the current distribution of *Draba corrugata* var. *saxosa* on National

Forest System lands, no alternative would contribute to adverse cumulative effects.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Draba corrugata* var. *saxosa* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Draba corrugata* var. *saxosa* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Downingia concolor var.
brevior**

Dudleya abramsii ssp. affinis

Dudleya abramsii ssp. affinis

Dudleya abramsii Rose ssp. *affinis* K. Nakai (San Bernardino Mountains dudleya)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3T2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Dudleya abramsii ssp. *affinis* is endemic to the San Bernardino Mountains in San Bernardino County (California Native Plant Society 2001). Known populations are generally centered around Big Bear Lake in the northern and eastern San Bernardino Mountains.

Distribution in the Planning Area

Dudleya abramsii ssp. *affinis* occurs on the San Bernardino National Forest. It is essentially endemic to the Mountaintop Ranger District, ranging from Kinley Creek, Deep Creek, and Little Pine Flats, east to the Onyx Peak Area, and from Bear Valley to the north slope (USDA Forest Service 2002). Most of the known occurrences are on National Forest System lands, although some are on private land in Bear Valley and on private inholdings within the Forest boundary.

Dudleya abramsii ssp. *affinis* occurs in the Coxey, Fawnskin, Arrastre Flats, North Baldwin Lake, Broom Flat, and Rattlesnake pebble plain complexes.

Taxonomy and Natural History

Dudleya abramsii ssp. *affinis* is a dicotyledon in the stonecrop family (Crassulaceae). There are six subspecies of *Dudleya abramsii* that differ in their distribution and habitat requirements. *Dudleya abramsii* ssp. *affinis* is distinguished by leaf shape, petal length, and caudex characteristics (Bartel 1993). This taxon is a perennial succulent herb that blooms from April to June (California Native Plant

Society 2001)

Dudleya abramsii ssp. *affinis* has a 10-15 mm wide caudex that is generally simple. The leaves are 2-4 cm, 7-15 mm wide, glaucous, oblanceolate to elliptic. The inflorescence is characterized by a 5-11 cm peduncle that is 1-3 mm wide. The lower bracts are 5-6 mm. The flowers have fused petals 1.5-2.5 mm with a generally red-lined keel (Bartel 1993).

Habitat Description

Dudleya abramsii ssp. *affinis* occurs in desert-side montane, upper montane conifer, and subalpine habitats (including pebble plains, carbonate, and pinyon-juniper woodlands). It grows on soil and rock outcrops and talus slopes composed of granite, quartzite, or limestone/carbonate. Populations are found at elevations of 4,100–8,530 feet (1,270-2,600 meters) (California Natural Diversity Database 2004).

Suitable habitat for *Dudleya abramsii* ssp. *affinis* is relatively widespread within the Planning Area, and may be threatened by vegetation and fuels treatments, mining (primarily where it occurs on carbonate), and vehicle travel off designated system roads (especially where they occur on pebble plains).

Occurrence Status

Dudleya abramsii ssp. *affinis* is recorded from fewer than 20 small populations within a narrowly restricted range (California Natural Diversity Database 2004), and numerous additional localities documented in herbaria. Population trends on private lands are negative due to habitat loss from development, but trends on National Forest System lands appear to be stable to slightly negative. (USDA Forest Service 2002).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Dudleya abramsii* ssp. *affinis* (San Bernardino Mountains dudleya)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1984	Green Canyon, ca. 0.5 km SW of FR 2N93 on trail to Sugarloaf Mtn. where trail crosses creek, on E side of creek. Common on granite w/ <i>Juniperus</i> , <i>Pinus</i> , <i>Cercocarpus</i> , <i>Echinocereus</i> . Type locality. SBNF.	SBD

2	U	1882	Cushenbury Springs. Land ownership: Mitsubishi Cement Company.	SBD
3	U	U	NW slope of Gold Mountain, 3.2 km W of Big Bear Refuse Dump. SBNF.	SBD
4	U	U	N shore of Baldwin Lake. Land owner: U.	SBD
5	U	U	Johnston Grade, San Bernardino Mountains. Collections from Johnston Grade and ridge E of Baldwin Lake. SBNF (at least in part).	SBD
6	U	U	Cushenbury Canyon, San Bernardino Mountains. Land owner: SBNF	SBD
7	U	U	Plateau S of Baldwin Lake, San Bernardino Mountains. (=South Baldwin Ridge) SBNF.	SBD
8	U	U	Holcomb Creek, ca. 5 mi. SW of Big Pine Flat. SBNF.	SBD
9	U	U	Mapped in vicinity of Deep Creek and Hooks creek, San Bernardino Mountains. (PCT) SBNF.	SBD

10	100-200	1996	ca. 0.4 mi. W of mouth of Arctic Canyon, N slope of San Bernardino Mountains. Single colony. Locally common on carbonate bedrock outcrop. w/ <i>Astragalus albens</i> , <i>Erigeron parishii</i> , <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> var. <i>goodmaniana</i> . Site approved for development as new limestone quarry. PVT.	SBD
11	U	1996	Upper Furnace Canyon, ca. 0.7 mi. up from confluence w/ Wild Rose Canyon, N slope San Bernardino Mtns. Ridgetops and steep slopes on carbonate bedrock. 'occasional' in 1996. SBNF, in part, and also portion on private/patented land owned by SMI (targeted for acquisition under CHMS))	SBD
12	20	1996	NE slope of White Mountain, ca. 1.6 mi. E of North Peak, N slope of San Bernardino Mtns. Just S of jeep trail in SW ¼ of SE ¼ of sec.5. On carbonate rock outcrop – ridgetop. <i>Eriogonum ovalifolium</i> var. <i>vineum</i> is just to W. BLM or PVT?	SBD
*	30	2000	S of Bertha Peak below cable line ca. 0.5 mi. to steep rocky slope. Pinyon/juniper woodland w/ <i>Quercus chrysolepis</i> , <i>Cercocarpus ledifolius</i> , <i>Arctostaphylos patula</i> , <i>Echinocereus</i> sp., <i>Achnatherum</i> sp., <i>Eriogonum</i> spp. On S-facing slope. Small section below utility line. Threat = utility line maintenance. SBNF.	SBD

*	30	1998	W side of Hwy 18, in flat region near crest of Nelson Ridge. Pinyon/juniper woodland with Joshua trees. Pebble plain habitat. SBNF.	SBD
*	< 5	1998	ca. 0.75 mi. ENE of confluence of Wild Rose and Furnace canyons. SBNF/Mitsubishi Cement Co.	SBD
*	U	U	Coxey Meadow Pebble Plain Complex. SBNF.	SBD
*	U	U	Fawnskin Pebble Plain Complex. SBNF/PVT.	SBD
*	U	U	Arrastre Flats Pebble Plain Complex. SBNF.	SBD
*	U	U	N Baldwin Lake Pebble Plain Complex. SBNF/CDFG.	SBD
*	U	U	Broom Flat Pebble Plain Complex. SBNF/PVT.	SBD
*	U	U	Rattlesnake Pebble Plain Complex. SBNF.	SBD
369313 (RSA)	U	1975	SBNF isolated tract S23 near Sawmill Canyon on pebble plain (Thorne/RSA)	SBD
83102 (UCR)	U	1994	Lower Furnace canyon on N slope San Bernardino Mts above Lucerne Valley T3N, R1E, S18. Landowner: U. (FS land with private inholding) (Sanders/UCR)	SBD

*	U	1994	Kinley Creek above Hwy 173 bridge toward the Pinnacles. Granitic area with rounded boulders on slopes and along creek bed. T3N,R3W,S28. SBNF (Sanders/UCR)	SBD
* 83635 (UCR)	U	2003	Kinley Creek below Hwy 173 bridge approx. 0.2 mi N of Forest Road 3N46 and just east of incinerator site in rocks above pools. SBNF (Kopp/Stamer/USFS) // Kinley Creek, above the Hwy 173 bridge, toward the Pinnacles (Sanders/UCR)	SBD
83435 (UCR)	U	1994	Deep Creek, from jeep trail crossing to Bacon flat to near Lion Canyon T3N,3W,S25,E1/2 and T3N, 2W, S31 W1/2. Both locations are on SBNF. (Sanders/UCR)	SBD
*	U	1998	Desert slope above Lucerne Valley, Mitsubishi cement property. NE of Cushenbury quarry and W of Hwy 18. T3N, R1E,S14 NE1/4. Alluvial wash and benches along Cushenbury Creek. (White/UC/Jeps)	SBD
*	U	1985	N slope along Hwy 18 1.5 mile below the point where it begins descending toward Mojave desert 5 miles above NF boundary. SBNF (Sanders/RSA)	SBD
*	U	1985	E end BB Valley around Baldwin Lake, North Shore. (LePre/UC/Jeps)	SBD

*	20	1996	Desert facing slopes, above Lucerne Valley, W of Silver Cr, just S of Pluesstauffer haul rd to White Knob quarry. (White/UC/Jeps) BLM & pvt.	SBD
*	U	1995	Mouth of Cushenbury Canyon, ridges and canyons just S of Mitsubishi Plant (Sanders, Wear/UC/Jeps) Pvt: MCC.	SBD
*	U	1998	Cushenbury Canyon, off Hwy 18 to the west. Pvt land. (Soza/RSA)	SBD
*	U	1976	Hwy 18, Cushenbury Grade summit with <i>Castilleja cinerea</i> , <i>Eriogonum kennedyi</i> . T2N, R2E, S5/6. SBNF (Davidson/RSA)	SBD
*	U	1978	Hwy 18, limestone bluffs on N side of rd. 9.2 miles SE of Lucerne Valley, 0.6 miles inside SBNF. (Davidson/RSA)	SBD
*	U	1976	N end Baldwin Lk near junction of Hwy 38 and 3N79Y. SBNF (DeBuhr/RSA)	SBD
*	U	1977	Cushenbury Grade, Hwy 18. N. slope SB mts, ca. 2 mi S of limestone quarry (DeBuhr/RSA)	SBD
*	U	1930	Ridge S of summit of Johnson Grade, east end SB Mts. (Peirson/RSA)	SBD
6621 (RSA)	U	1933	N end Baldwin Lk just above high water line on small rocky knoll (Stark/RSA)	SBD

24400 (RSA)	U	1941	Desert side Johnson Grade 3 1/10 mile below summit (Wolf) SBNF	SBD
*	U	2002	South slope Delamar Mountain, upslope from Forest Road 2N71, among white quartzite scree. SBNF	SBD
619337 (RSA)	U	1998	San Bernardino Mountains: Cushenbury Canyon, off Highway 18 to the west, near Cal Trans 5000 foot elevation sign. UTM 05 14 846 mE, 37 99 505 mN. Near 34 ° 20.3' N 116 ° 50.3'. T3 N R1 E SE 1/4, SE 1/4 sec. 14. Elev. ca. 5000 Feet. (Soza)	SBD
423474 (RSA)	U	1978	Hwy 18, 9.2 mi SE of Lucerne Valley, 0.6 mi inside San Bernadino National Forest Elev. 4900 ft.	SBD
802937 (CalFlora)	U	1989	San Bernardino Mountains, Bear Valley, hill in SW¼ of SW¼ Section 31, T3N, R2E 6800 ft elev	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned (USDA Forest Service 2002)*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Threats on National Forest System lands are recreational impacts resulting from hiking, mountain biking and vehicle travel off forest transportation system roads. Large-scale carbonate mining is substantial threat to this species where it grows on carbonate. (USDA Forest Service 2002)

Conservation and Management Considerations

Some occurrences of *Dudleya abramsii* ssp. *affinis* are adversely affected by limestone mining. Many

of the occurrences associated with pebble plains on the San Bernardino National Forest are protected by fencing, but many pebble plain occurrences remain at risk of vehicle travel off designated roads (USDA Forest Service 2002). Some populations of *Dudleya abramsii* ssp. *affinis* occur on pebble plains and carbonate soils with listed threatened and endangered species; however, more often, this taxon occurs with pebble plain species. Habitat protection for pebble plains and carbonate endemics will help satisfy viability needs of this taxon in part of the species range. However, the portion of the range associated with granite or quartzite is essential to maintain viable and well distributed populations on National Forest System lands. These areas currently receive minimal to moderate ongoing impacts from general recreation use (USDA Forest Service 2002), and are at the highest for fuels and vegetation treatments.

The primary conservation strategy for this species is to implement the Pebble Plain Habitat Management Guide and the Carbonate Habitat Conservation Strategy, and to improve our knowledge of this species' distribution. The following is a list of conservation practices that should be considered for *Dudleya abramsii* ssp. *affinis*:

- Implement the Pebble Plain Habitat Management Guide and the Carbonate Habitat Management Strategy.
- Survey all new occurrences of *Dudleya abramsii* ssp. *affinis* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Dudleya abramsii* ssp. *affinis* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Dudleya abramsii* ssp. *affinis* in the southern California National Forests using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Dudleya abramsii ssp. *affinis* is a locally-common narrow endemic species known only to occur in the northeastern San Bernardino Mountains on pebble plain and carbonate habitat, and occasionally quartzite scree and granite outcroppings. Some of the pebble plain habitat on which it occurs is protected from identified threats, although most other occurrences are not well protected from identified threats.

Based on the above analysis, *Dudleya abramsii* ssp. *affinis* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	A	A	B	A	C	A

Dudleya abramsii ssp. *affinis* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The viability of this species is tied to protection and management of pebble plain and carbonate habitats.

Existing protections of these habitats for the benefit of the associated listed threatened and endangered plant species provide considerable baseline protection. With implementation of the Pebble Plain Habitat Management Guide and the Carbonate Habitat Management Strategy, viability for this species across most of the species range from Onyx Peak to Coxey Meadow and north to the north slope is secure. Additional protection at the south and west portion of its distribution from Fawnskin to Deep Creek is important for viability independent of pebble plain and carbonate management.

Under Alternative 1, pebble plain habitat in general, and *Dudleya abramsii* ssp. *affinis* in particular, would continue to be at risk from unauthorized vehicle travel off Forest Transportation System roads and trails. There is an existing area zoned Back Country Non-Motorized (BCNM) at Little Pine Flat that would provide some protection. Under Alternative 2, the Bertha, Coxey, Deep Creek and Gold Mountain Critical Biological (CB) zones, the Blackhawk, Arrastre and Wildhorse recommended RNA's, the Sugarloaf proposed wilderness, and BCNM zoning at Deep Creek, Little Pine Flat and lower Sugarloaf would provide substantial protection for this species. Under Alternative 3, the Coxey, Union, and Gold Mountain CB zones, the Blackhawk, Arrastre and Wildhorse recommended RNA's, the Sugarloaf proposed wilderness, the Deep Creek proposed wilderness (including Little Pine Flat) and BCNM zoning at upper Arctic and Marble Canyons (where this species occurs on carbonate) would provide substantial protection for this species. Under Alternative 4, the Coxey and Deep Creek CBZ, BCNM zoning at Little Pine Flat, and the Sugarloaf proposed wilderness would provide protection for limited portions of the species range, however the important protections associated with RNA designations and the Gold Mountain CBZ would not occur. Under Alternative 4a, the Bertha, Coxey, Deep Creek and Gold Mountain CB zones, the Blackhawk and Arrastre recommended RNA's, the Heartbreak Ridge recommended Wilderness, and more extensive backcountry non-motorized zoning across the species range provide substantial protection. Under Alternative 5, land use zoning would not provide any protection, nor are there recommendations for special area designations that would protect occurrences under this alternative. Under Alternative 6, BCNM zoning across the range of the species, along with the Blackhawk, Arrastre and Wildhorse recommended RNA's and the Union, Gold Mountain, and Coxey CBZ, and the Sugarloaf proposed wilderness would provide substantial protection. Deep Creek, including habitat for this species, is mapped as eligible for Wild and Scenic River designation under all alternatives.

Consideration of the Suitable Use restricting vehicle travel to designated Forest Transportation System roads and trails, along with Standards regarding recreation factor into the outcomes. The proposed Blackhawk, Wildhorse, and Arrastre RNA's, the Sugarloaf and Heartbreak recommended wilderness areas, and the Gold Mountain CB zone, where applied, are critical to the outcomes. Presumed implementation of the Pebble Plain Habitat Management Guide and Carbonate Habitat Management Strategy is key to these outcomes under all alternatives.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

The relatively small area of habitat for *Dudleya abramsii* ssp. *affinis* on private lands in Big Bear Valley has been reduced by residential and commercial development. Carbonate habitat on patented lands on the north slope has been reduced by large-scale limestone mining operations. The remaining fragments on private land continue to be lost as continued development occurs. These losses are not expected to reduce the viability of the protected and managed occurrences on the SBNF.

By maintaining the current distribution of *Dudleya abramsii* ssp. *affinis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Dudleya abramsii* ssp. *affinis* to suffer a decline in its overall distribution.

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Draba corrugata var. saxosa

**Dudleya cymosa ssp.
crebrifolia**

Dudleya cymosa ssp. crebrifolia

Dudleya cymosa (Lemaire) Britton & Rose ssp. *crebrifolia* K. Nakai & Verity (San Gabriel River dudleya)

Management Status

Federal: None

California: none

Heritage Rank: G5T1, S1.2 (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Dudleya cymosa ssp. *crebrifolia* is known from a single occurrence in Fish Canyon in the San Gabriel Mountains (California Natural Diversity Database 2004).

Distribution in the Planning Area

The single known occurrence of this taxon is entirely within the Angeles National Forest, constituting about a one-mile stretch along the walls of Fish Canyon (California Natural Diversity Database 2004).

Taxonomy and Natural History

Dudleya cymosa ssp. *crebrifolia* is a dicot in the stonecrop family (Crassulaceae). There are nine subspecies of *Dudleya cymosa*. San Gabriel River dudleya differs from the other subspecies in the number of peduncle bracts, leaf shape and size, and its restricted distribution (Bartel 1993). *Dudleya cymosa* ssp. *crebrifolia* is an uncommon perennial succulent herb that blooms April-July (California Native Plant Society 2001).

Dudleya cymosa ssp. *crebrifolia* is one of seven recognized subspecies of *D. cymosa*. Subspecies *pumila* may overlap in range with *Dudleya cymosa* ssp. *crebrifolia*, and there are collections of a variety of *Dudleya cymosa* that are as yet unidentified from steep walls of several canyons across the lower San Gabriel and San Bernardino front country from Pasadena east to City Creek.

Habitat Description

Dudleya cymosa ssp. crebrifolia grows on granite cliffs and outcrops within sage scrub and chaparral between 1000 and 1500 feet (California Natural Diversity Database 2004, Nakai 1987).

Occurrence Status

The CNDDDB lists the single occurrence at Fish Canyon as extant, with 1000's of individual plants.

OCCURRENCE DATA of *Dudleya cymosa ssp. crebrifolia* (San Gabriel River dudleya) on National Forest lands

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	1000's	U	Fish Canyon, ANF	LA

- U = Unknown
- ANF = Cleveland National Forest
- LA = Los Angeles County

Threats

Any *Dudleya cymosa ssp. crebrifolia* on adjacent private land has likely been extirpated by mining of decomposed granite, which has removed the canyon walls from the ANF boundary to the foot of the mountain. If any plants have survived this mine, they would be at risk of loss by expansion of raveling of slopes made more unstable by mining. There is a trail up Fish Canyon that attracts limited recreation use. However, the steep canyon wall habitat for this species makes substantial impacts of recreation very unlikely. Mechanical treatment of sage scrub and chaparral vegetation in the Wildland Urban Interface would be nearly impossible on this terrain.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Dudleya cymosa ssp. crebrifolia*:

- Monitor and map all habitat and species occurrences on National Forest System land and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Potential threats to *Dudleya cymosa* ssp. *crebrifolia* on National Forest System lands may include disturbance of habitat by hikers and possible horticultural collecting, although there have been no observations of these potential impacts to this taxon. The steep and inaccessible terrain that this species occupies is expected to protect it from any substantial threats to its persistence.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon and disjunct in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Dudleya cymosa* ssp. *crebrifolia* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Dudleya cymosa* ssp. *crebrifolia* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Dudleya abramsii ssp. affinis

Dudleya cymosa ssp. ovatifolia

Dudleya cymosa ssp. ovatifolia

Dudleya cymosa ssp. ovatifolia (Britton) Moran (Santa Monica Mountains dudleya)

Management Status

Federal: Threatened (62 Federal Register 4172, January 29, 1997)

California: None

Heritage Rank: G1, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

There is no Critical Habitat designated or proposed for this taxon.

General Distribution

Dudleya cymosa ssp. ovatifolia is known from Orange, Los Angeles, and Ventura counties in the Santa Monica and Santa Ana Mountains (California Natural Diversity Database 2004).

Distribution in the Planning Area

Within National Forest System lands, *Dudleya cymosa ssp. ovatifolia* occurs in the Santa Ana Mountains on the Cleveland National Forest. These occurrences represent a range disjunction of approximately 60 miles (97 kilometers) from populations in the Santa Monica Mountains. The Cleveland National Forest has two occurrence records for *Dudleya cymosa ssp. ovatifolia*. One occurrence is located on the north-facing escarpment of Santiago Canyon near the town Modjeska Canyon. The other occurrence is on the northwest slope of Modjeska Peak south of the Maple Springs Truck Trail junction. A third occurrence is mapped in the California Natural Diversity Database (CNDDDB) along Santiago Canyon/Joplin Trail (starting at the town of Modjeska Canyon and running to the saddle between Modjeska Peak/Santiago Peak) (California Natural Diversity Database 2004, Occ. # 9).

Taxonomy and Natural History

Dudleya cymosa ssp. ovatifolia is a perennial herb in the stonecrop family (Crassulaceae) that blooms

March–June (California Native Plant Society 2001). The stem caudex is 1-1.5 cm wide with 0 to few branches. Leaves are oblong to elliptic to ovate in shape with 6-10 per rosette, 2-5 cm long and 15-25 mm wide. Peduncles are 4-15 cm with terminal branches of 1-3 cm with 3-5 flowers. Petals are bright yellow (rarely orange or red-marked) (Bartel 1993).

Nakai (1987) treated the populations on the north slope of the Santa Monica Mountains as a separate subspecies, *ssp. agourensis*. This subspecies (*agourensis*) was not considered to be a valid taxon in *The Jepson Manual* (Bartel 1993), nor was it recognized in the final listing rule for *Dudleya cymosa ssp. ovatifolia* (U.S. Fish and Wildlife Service 1997). The two taxa are treated together in this account. The California Native Plant Society (2001) and the California Natural Diversity Database continue to maintain separate records for the two taxa (California Natural Diversity Database 2004).

Dudleya cymosa ssp. ovatifolia is one of seven recognized subspecies of *D. cymosa*. Subspecies that may have some overlap in their ranges with *Dudleya cymosa ssp. ovatifolia* are *ssp. marcescens*, *ssp. paniculata*, and *ssp. pumila*. *Dudleya cymosa ssp. ovatifolia* can be distinguished from *ssp. marcescens* by the caudex width and number of leaves (as well as by the fact that *ssp. marcescens* leaves wither in the summer). It can be distinguished from *ssp. paniculata* and *ssp. pumila* by leaf and inflorescence characteristics (Bartel 1993).

Habitat Description

Dudleya cymosa ssp. ovatifolia grows on sedimentary conglomerate or volcanic breccia rock outcrops in coastal scrub and chaparral habitats (California Natural Diversity Database 2004, Nakai 1987). With the exception of the Modjeska Peak populations, at an elevation of 4640 and 5100 feet (1415 and 1555 meters), this taxon usually occurs on steep slopes between 700 and 1600 feet (215 and 490 meters) in elevation (Soza and Boyd 1999).

Occurrence Status

The CNDDDB lists 7 occurrences for *Dudleya cymosa ssp. ovatifolia* (4 of which are included in the table below) and 8 occurrences for *ssp. agourensis*. The subspecies *agourensis* occurrences are in Ventura and Los Angeles Counties, with 8 on private land and one owned and protected on Conejo Open Space Conservation Agency. These occurrences range from 100-1000 individuals per site. The subspecies *ovatifolia* occurrences are located in Santa Ana Mountains and Santa Monica Mountains. Two of these CNDDDB occurrences are on private lands, one on State lands. The remaining four CNDDDB occurrences on the Cleveland National Forest actually make up three locations. These populations range from 80 to 1000 individuals per site.

OCCURRENCE DATA of *Dudleya cymosa ssp. ovatifolia* (Santa Monica Mountains dudleya) on National Forest lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
1	2-1	1000	1999	Santiago Canyon / CNF	OR
11	*	U	1988	Santiago Canyon, Joplin Trail / CNF-non-specific	OR
9	2-2	500 800	1997 1999	Modjeska Peak / CNF	OR
12	2-2	80	1999	Modjeska Peak / CNF	OR

- U = Unknown
- * = an occurrence number has not been assigned
- CNF = Cleveland National Forest
- OR = Orange County

Threats

Dudleya cymosa ssp. *ovatifolia* populations on private lands are declining primarily because of habitat loss from urban development (U.S. Fish and Wildlife Service 1997).

On the Cleveland National Forest, the occurrence on Modjeska Peak is roadside and experiences some local foot traffic and some trash accumulation, in addition of dust accumulation due to its proximity to the road. In addition, some plants occur on talus slopes adjacent to the road. Rockslides and shifts in habitat are inherent in steep these talus slope environments. Tumbling rocks may move whole plants off talus slopes and on to the road below where plants may be crushed or dried out. The occurrence along Santiago Canyon/Joplin Trail is in a remote location and receives few visitors. The occurrence near Modjeska Canyon Village (CNF Occ. 2-1) is also partially within Orange County Parks and private lands. Use of this area by rock climbers may affect this occurrence (California Natural Diversity Database 2004).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Dudleya cymosa* ssp.

ovatifolia:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Survey modeled habitat.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Monitor occurrences at Modjeska Peak and Santiago Canyon. Monitor during high recreation periods or during Santiago Peak communication site maintenance periods along Forest Road 13S04 (North main Divide Road) near the occurrences.
- Allow wildland fires to freely burn through occurrences. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads.
- Avoid the use of Modjeska Peak and adjacent ridgelines as for fuel breaks construction or as holding lines during wildfire suppression. The use of hand line for fuel break construction is preferred.
- Do not develop additional trails or other facilities near known occurrences.
- Avoid constructing pullouts or parking areas along Forest Road 13S04 (North Main Divide Road) near the occurrences.
- Avoid using or dumping fill material at the occurrence at Modjeska Peak during road maintenance along Forest Road 13S04 (North Main Divide Road).
- Use water tanks for dust abatement during road maintenance near occurrences along Forest Road 13S04 (North Main Divide Road).
- The species is included in the conservation strategy for coastal sage scrub protection (USDA Forest Service and others 1997). Implement to the extent practicable.

Evaluation of Current Situation and Threats on National Forest System Lands

There are no substantial threats from Forest Service activities to habitat which occurs on steep talus slopes and rock outcrops. Potential threats to *Dudleya cymosa* ssp. *ovatifolia* on National Forest System lands include disturbance of habitat by recreationists and possible horticultural collecting, although there has been no evidence to date of this type of disturbance (USDA Forest Service 2000). One occurrence located on an old road off of North Main Divide leading to Modjeska Peak is accessible to foot traffic, and evidence of trash has been noted. However, the occurrence of this plant generally on steep talus slopes means that it is not substantially affected by the occasional recreation use in its habitat. Continued monitoring of known locations should identify whether risks to the taxon are increasing and whether additional protective measures need to be implemented.

There are no developed recreation sites within or near occupied habitat. The North Main Divide Road runs adjacent to but not through, the Modjeska Peak occurrence, and road maintenance does not directly affect plants. There is no overlap of occupied or suitable habitat with existing trails or areas under recreation special use permit. No areas of occupied habitat are grazed by livestock or under development for minerals. Current populations on NFS lands are stable.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon and disjunct in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Dudleya cymosa ssp. *ovatifolia* is listed under the Endangered Species Act of 1973, as amended, as threatened, which assures that any new project proposed on NFS land in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Dudleya cymosa* ssp. *ovatifolia* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Dudleya cymosa* ssp. *ovatifolia* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Dudleya cymosa ssp.
crebrifolia**

Dudleya densiflora

Dudleya densiflora

Dudleya densiflora (Rose) Moran (San Gabriel Mountains dudleya)

Management Status

Federal: Forest Service Sensitive Species

State: None

Heritage Rank: G1 S1.1 – very threatened

California Native Plant Society (2001): List 1B, R-E-D Code 3-3-3

General Distribution

Dudleya densiflora is known from six occurrences in three groups along the San Gabriel River at Fish Canyon, Roberts Canyon, and the mouth of the San Gabriel River canyon (California Natural Diversity Database 2004). Surveys in 1989 identified additional potential habitat in the current geographic range of this species, but these areas are inaccessible due to the steep terrain and dense vegetation (Mistretta and Brown 1989).

Distribution in the Planning Area

Dudleya densiflora occurs on the Angeles National Forest at San Gabriel, Roberts and Fish Canyons, and on private land at the mouth of the San Gabriel River (California Natural Diversity Database 2004). Most of the individual plants censused in 1989 occur on the Angeles National Forest (Mistretta and Brown 1989).

Taxonomy and Natural History

Dudleya densiflora is a dicot in the stonecrop family (*Crassulaceae*). It is distinguished from congeners that share its range by clumping rosettes, subterete (roundish) leaves, spreading follicles, and white or pink petals (Mistretta and Brown 1989).

Dudleya densiflora is a succulent perennial herb that blooms March-July (California Native Plant Society 2001). Plants persist in a semi-dormant state during periods of drought, and leaf turgidity is restored by additional precipitation (Mistretta and Brown 1989).

Habitat Description

Like many *Dudleya* species, *Dudleya densiflora* grows on granitic substrates on cliffs, from crevices in rocks, and on steep canyon walls (California Natural Diversity Database 2004). It occurs at elevations of 800-2,000 feet (240-600 meters) in chaparral, coastal scrub, mixed evergreen woodland, and riparian woodland (Mistretta and Brown 1989, California Natural Diversity Database 2004).

Occurrence Status

Since the 1940s, the number of *Dudleya densiflora* plants at the San Gabriel River canyon and Fish Creek Canyon has declined, especially at lower canyon sites (Stephenson and Calcarone 1999). This decline is attributed mainly to rock-quarrying operations on private lands below the forest boundary (Mistretta and Brown 1989). Approximately 1,750 plants were counted during surveys in 1989 (Mistretta and Brown 1989).

OCCURRENCE DATA – *Dudleya densiflora* (San Gabriel Mountains Dudleya)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	100 in 1986	1986	MOUTH OF FISH CANYON AT THE SAN GABRIEL RIVER, NORTH OF AZUSA, SAN GABRIEL MOUNTAINS. THREE COLONIES BETWEEN THE MOUTH OF CANYON AND THE GAGING STATION, T01N/R10W/S21	LA
2	1000+ in 1986, 750 in 1989	1989	FISH CANYON, FROM ABOUT 1 MILE UPSTREAM TO 1 MILE DOWNSTREAM OF THE FALLS, NORTH OF AZUSA, SAN GABRIEL MOUNTAINS. SEVERAL COLONIES SCATTERED ALONG THE CANYON WALLS, BEGINNING JUST NORTH OF FERN CANYON AND CONTINUING FOR ABOUT 2 MILES. MAPPED AS SEVEN LITTLE POLYGONS	LA

			AT CNDDDB, T01N/R10W/S09	
4	100's in 1989	1989	ROBERTS CANYON, ABOUT 1-2 MILES UPSTREAM FROM MOUTH, NORTH OF AZUSA, SAN GABRIEL MOUNTAINS. FOUR COLONIES OVER 0.8 MILE OF CANYON, FROM 0.3-1.1 MILES NORTH OF MWD UPPER FEEDER. ELEVATION RANGES FROM 1000 TO 1600 FEET, T01N/R10W/S10	LA
5	250 in 1989	1989	SAN GABRIEL CANYON, ABOUT 1 MILE EAST OF MOUTH OF ROBERTS CANYON, NORTH OF AZUSA, SAN GABRIEL MOUNTAINS. NORTHWEST ASPECT ALONG AZUSA POWER PLANT CONDUIT AT 800-1200 FEET ELEVATION, T01N/R10W/S24	LA
9	30 in 1985	1985	NEAR SAN GABRIEL DAM, ON CLIFF FACE JUST SOUTH OF GAGING STATION. LOCATION IS JUST WEST OF QUARRY USED FOR DAM CONSTRUCTION, T01N/R09W/S05	LA
11	100's in 1989	1989	LOWER ROBERTS CANYON ABOUT 0.5-1 MILE UPSTREAM FROM MOUTH, NORTH OF AZUSA, SAN GABRIEL MOUNTAINS. THREE COLONIES MAPPED ALONG EITHER SIDE OF CANYON, MOSTLY WITHIN THE E 1/2 OF THE SE 1/4 OF SECTION 15; SOME IN SW1/4 SECTION 14.	LA

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *LA = Los Angeles County*

Threats

Threats include mining, development (California Native Plant Society 2001), and, possibly, unauthorized collecting.

Conservation and Management Considerations

The Angeles National Forest has produced a management guide for *Dudleya densiflora*, the objective of which is to outline a management plan that will ensure the survival of the species through time (Mistretta and Brown 1989). The management directives include the following: that biological concerns for the species are addressed, that conflicts with other resource values are minimized, that opportunities for reintroduction of the species into suitable habitat are investigated, that geographic and genetic diversity within the species be maintained by protecting all known populations in occupied habitat, and that populations be monitored to assess vigor and gather life history information.

Evaluation of Current Situation and Threats on National Forest System Lands

Quarrying activities on private land in Fish Canyon obliterated all native vegetation at the mouth of the canyon, and the 1989 surveys were unable to locate any plants from this historic occurrence location (Mistretta and Brown 1989). A hiking trail through one occurrence could provide hikers the opportunity for collecting plants. This potential threat may increase as visitor use increases. The population in the San Gabriel River canyon could be affected by road maintenance that could cause damage to surrounding cliff faces (Mistretta and Brown 1989).

Based upon the above analysis *Dudleya densiflora* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6

C	C	C	C	C	C	C
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Dudleya densiflora is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Existing and proposed management direction provides for the protection of all known populations in occupied habitat, and this direction should enable existing occurrences on National Forest System land to maintain their current distribution and abundance. Under all alternatives, impacts from quarrying, facility development, and road maintenance would be avoided or minimized.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

Dudleya densiflora is known from only six occurrences and has a restricted distribution that raise additional concerns regarding its long-term viability. Because of its limited geographic distribution, localized habitat disruptions on private lands can pose threats to individual populations and to the species.

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Dudleya cymosa ssp. ovatifolia	Dudleya multicaulis
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Dudleya multicaulis

Dudleya multicaulis (Rose) Moran (Many-stemmed dudleya)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 1-2-3

General Distribution

Dudleya multicaulis, Many-stemmed dudleya, is known from coastal and foothill areas of Los Angeles, Orange, San Bernardino, western Riverside, and San Diego counties (Bartel 1993, California Natural Diversity Database 2004).

Distribution in the Planning Area

Within National Forest System lands, *Dudleya multicaulis* occurs on the Cleveland National Forest. Occurrence locations include the Santa Ana Mountains southwest of Sierra Peak summit; the Santa Margarita Mountains along Indian Potrero Truck Trail; and the San Mateo Wilderness area in Oak Flats and along the Lucas Canyon Trail in Aliso Canyon. There are several occurrences recorded adjacent to the Angeles National Forest near San Dimas (California Natural Diversity Database 2004).

Taxonomy and Natural History

Dudleya multicaulis is a perennial succulent herb. Stems are corm-like, 1.5-5 cm long and 3-18 mm side, simple, and oblong. Leaves are 4-15 cm long, 2-6 mm wide, linear and cylindrical (except at the base, 4-10 mm wide). Leaf tips are narrowly acute. The inflorescence has 2 to many primary branches that are simple or forked. Peduncles are 5-35 cm long, 2-4 mm wide, with terminal branches of 2-10 cm with 3-15 flowers having pedicels of 0-3 mm long. Sepals are 2-3 mm, deltate-acute. Petals are 5-9 mm and 2-3 mm wide, fused for 1-2 mm, elliptic-lanceolate, and acute. Fruits have spreading follicles (Bartel 1993). Plants flower from March to July having yellow flowers with red flecks (California Native Plant Society 2001).

This species forms vegetative parts and inflorescences aboveground each year during the rainy season (December-May), with the aboveground parts dying back in late spring, leaving just the dormant underground corm (Marchant and others 1998). It is pollinated by at least one bee species, and it may be capable of some self-pollination (Marchant and others 1998).

Habitat Description

Dudleya multicaulis occurs in *clay soil and Cretaceous marine sediment* in barrens, rocky places, or thinly vegetated openings in chaparral, coastal scrub, and valley and foothill grasslands at elevations of 50–2,590 feet (15–790 meters) (Bartel 1993, California Native Plant Society 2001). Majority of the population are associated with coastal sage or open coastal sage scrub. It is usually found in openings on dry, stony soils, often with high clay content (Stephenson and Calcarone 1999). Associated species include *Harpagonella palmeri*, *Allium munzii*, *Fritillaria biflora*, *Lupinus bicolor*, *Nassella pulchra*, *Eriogonum fasciculatum*, *Artemisia californica*, and *Juniperus californica*.

Occurrence Status

The California Natural Diversity Database (CNDDDB) lists 113 occurrences for *Dudleya multicaulis*, 14 of which are presumed extirpated. The majority of the occurrences (71) are located on private lands (approximately 70% of extant occurrences). Some populations have over 10,000 plants (CNDDDB Occ. # 9, Estelle Mountain in Riverside County; CNDDDB Occ. # 32, Christianitos Canyon in Orange County) (California Natural Diversity Database 2004). Most occurrences range from 25 to 400 to 1000 individuals per site. The remaining occurrences not on private lands are protected on State (University of California, Irvine, and California State Parks), Audubon Starr Ranch, County and City municipalities, and Camp Pendleton Marine Corps Base (Department of Defense). Occurrences on these protected sites have between 7 to over 2500 individuals per site. On National Forest System lands there are four occurrences on the Cleveland National Forest.

OCCURRENCE DATA of *Dudleya multicaulis* (Many-stemmed dudleya) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
2-1	98	100	1992	Sierra Peak /CNF	OR
2-2	104	1000	1992 / 1999	Aliso Cyn (San Mateo Wilderness) / CNF	RIV/OR

2-3	103	500-1000	1992 / 1999	Oak Flats (San Mateo Wilderness) / CNF	RIV
2-4	99	500	1995	Indian Potrero (San Mateo Wilderness) /CNF	SD

- CNF= Cleveland National Forest
- RIV = Riverside County
- SD = San Diego County
- OR = Orange County

Threats

Many of the *Dudleya multicaulis* occurrences on private lands and in road corridors are threatened primarily by road construction and maintenance. Other threats include fire suppression activities, mining, grazing, dumping, and recreation activities (trampling) (California Natural Diversity Database 2004). Some occurrences are also threatened by nonnative species invasion such as *Brassica nigra* (California Natural Diversity Database 2004). Most occurrences are located on private lands with potential for development. Potential threats to the populations on the Cleveland National Forest include off-highway vehicle use, grazing, and recreation (USDA Forest Service 1998).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Dudleya multicaulis*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Allow wildland fires to freely burn through occurrences. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads.
- Do not develop additional trails or other facilities near known occurrences.
- The species is included in the conservation strategy for the protection of coastal sage scrub (USDA Forest Service and others 1997). Continue to implement elements of this strategy as practicable.

Evaluation of Current Situation and Threats on National Forest System Lands

Dudleya multicaulis is considered to have low vulnerability on National Forest System lands. Three of the occurrences on the Cleveland National Forest are within the San Mateo Wilderness and receive few

visitors. These occurrences are subjected to grazing and the occasional recreation trampling, but monitoring has indicated that these populations are stable. Threats to the fourth occurrence at Sierra Peak are unknown. However, this occurrence is mapped along of a spur road off of North Main Divide and may potentially be disturbed by off-highway vehicles or other recreation activity. If monitoring shows damage to this population, protective barriers may be installed.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Dudleya multicaulis is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Dudleya multicaulis*. Variations in land use designations would not alter this current situation, and the various emphases of the alternatives would not result in a substantial change in conditions for *Dudleya multicaulis*. *Dudleya multicaulis* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Lands within Range of Taxon

Dudleya multicaulis is at risk of extirpation in a portion of its range but is found in sufficient numbers and wide enough distribution that the potential for extinction is considered to be low (California Native Plant Society 2001). Populations of *Dudleya multicaulis* are declining, primarily due to development (Marchant and others 1998, USDA Forest Service 1998). Low gene flow between populations and a high level of interpopulation genetic variation suggest that populations may be adapted to local habitats (Marchant and others 1998), indicating that maintaining both population sizes and numbers are important for conserving the species. By maintaining the current distribution of *Dudleya multicaulis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Dudleya multicaulis* to suffer a decline in its overall distribution.

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Dudleya densiflora

Dudleya viscida

Dudleya viscida

Dudleya viscida (S. Watson) Moran (Sticky dudleya)

Management Status

Federal: Forest Service Sensitive

California: None (California Department of Fish and Game)

Heritage Rank: G2, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Dudleya viscida, sticky dudleya, is distributed in the coastal foothills and mountains of Orange, Riverside, and San Diego counties.

Distribution in the Planning Area

Dudleya viscida occurs on the Cleveland National Forest in the Santa Ana and Santa Margarita Mountains. Large populations are present in the San Mateo Wilderness, including a significant occurrence at Devil's Gorge where Devil's Canyon and San Mateo Creek meet in the northeastern corner of Camp Pendleton (Stephenson and Calcarone 1999, California Department of Fish and Game 2002). One large occurrence is found along the Ortega Highway in San Juan Canyon (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Dudleya viscida is a perennial succulent herb in the stonecrop family (Crassulaceae). The stem is a short caudex 1-4 cm side and branched. Leaves are 6-15 cm long, 5-15 cm wide, 3-5 mm thick, elliptic in cross-section, linear-deltate, sticky, appearing oily and with a resinous odor. The leaf bases are 1-2 cm wide and leaf tips are abruptly pointed. Primary inflorescences are 3 to many, forked 1-2 times. The peduncle is 2-4 dm long, and 2-8 mm wide. Terminal branches are 2-6 cm with 3-10 flowers having pedicels of 1-4 mm. Sepals are 1.5-4 mm, ovate and acute. Petals are 6-9 mm, 2.5-3.5 mm wide, elliptic, acute, and spreading from the middle. Fruit follicles are ascending (Bartel 1993). Flowers are

white with red stripes (Bartel 1993) and are seen from May to June (California Native Plant Society 2001).

Habitat Description

Dudleya viscida occurs on rock outcrops, cliffs, and bluffs along stream courses and also along road cuts in coastal bluffs in southern mixed chaparral, coast live oak woodland and sycamore woodland (California Native Plant Society 2001, Stephenson and Calcarone 1999). In San Diego County, it has been associated with exposed gabbroic or in very shallow soils and cracks on vertical rock faces (Cleveland National Forest records).

Occurrence Status

The CNDDDB lists 20 occurrences for *Dudleya viscida*. Six of these occurrences are on private lands in small numbers, and five occurrences are relatively protected on Camp Pendleton Marine Corps Base (Department of Defense–DOD). The DOD occurrences range from 300 to 2000 plants per site, with one occurrence well protected on cliffs. The remaining occurrences are on National Forest System lands on the Cleveland National Forest, having the largest population centers with 30,000–500,000 total individuals. *Dudleya viscida* is restricted in distribution, but abundant where it occurs.

OCCURRENCE DATA of *Dudleya viscida* on National Forest System lands

Sticky Dudleya

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
5?	2-1	U	1936	San Juan Creek / CNF	OR
5?	2-2	U	1948	San Juan Canyon / CNF	OR
5?	2-3	U	1976	San Juan Hot Springs / CNF	OR
5	2-4	U	U	San Juan Hot Springs / CNF	OR

13	2-5	1000	1990	Fisherman's Camp (San Mateo Wilderness) / CNF	RIV
24	2-7	5000+	1992	Lucas Canyon (San Mateo Wilderness) / CNF	OR
22	2-8	100-500	1992	Lucas Canyon (San Mateo Wilderness) / CNF	RIV
20	2-9	U	1992	Santa Mateo Creek (San Mateo Wilderness) / CNF	RIV/SD
21	2-10	U	1992	Santa Mateo Creek (San Mateo Wilderness) / CNF	RIV
13	2-11	1000	1992	San Mateo Canyon (San Mateo Wilderness) / CNF	RIV
14	2-12 2-6	10,000	1992	San Mateo Canyon (San Mateo Wilderness) / CNF	SD
19	2-13	U	1992	Cold Spring Canyon (San Mateo Wilderness) / CNF	SD
20	2-14	U	1992	Santa Mateo Creek (San Mateo Wilderness) / CNF	SD/RIV
20	2-15	U	1992	Santa Mateo Creek (San Mateo Wilderness) / CNF	SD/RIV

18	2-16	50,000	1992	Devil Canyon (San Mateo Wilderness) / CNF	SD
6	*	300	1978	Sitton Peak Truck Trail (San Mateo Wilderness) / CNF	OR
*	2-17	U	1992	San Mateo Canyon (San Mateo Wilderness) / CNF	SD

- U = Unknown.
- * = an occurrence number has not been assigned.
- CNF = Cleveland National Forest
- RIV = Riverside County
- SD = San Diego County
- OR = Orange County

Threats

On private lands *Dudleya viscida* is threatened by road maintenance and development. Occurrences on Camp Pendleton are protected with occasional disturbance from military training activities. On the Cleveland National Forest all occurrences are in the San Mateo Wilderness, with the exception of four occurrences along Highway 74 (Ortega Highway). These populations are well protected on cliffs in remote areas that receive few visitors. Two of the large populations were burned over in the 1993 Ortega Fire with few plant deaths resulting (USDA Forest Service 1998). *Dudleya viscida* populations appear to be stable, except for populations that may be displaced by road construction (Stephenson and Calcarone 1999). The four Cleveland NF populations occurring along Highway 74 (Ortega Highway) are inaccessible to recreationists. However, proposed re-alignment and widening of Highway 74 may threaten these occurrences.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Dudleya viscida*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Allow wildland fires to freely burn through occurrences. Minimize earth-movement during fire

suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads.

- Do not develop additional trails or other facilities near known occurrences.
- The species is included in the conservation strategy for coastal sage scrub protection (USDA Forest Service and others 1997). Continue to implement the provisions of this strategy to the extent practicable.

Evaluation of Current Situation and Threats on National Forest System Lands

Dudleya viscida is considered to have low vulnerability on National Forest System lands. The majority of the occurrences are within the San Mateo Wilderness with population numbers ranging from 300,000 to 500,000 plants. Occurrences along Highway 74 are on steep, inaccessible road cuts and slopes. This plant is currently not substantially affected by Forest Service activities.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, but abundant where it occurs, in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Dudleya viscida is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Dudleya viscida*. Variations in land use designations would not alter this current situation and the various emphases of the alternatives would not result in a substantial change in conditions for *Dudleya viscida*. *Dudleya viscida* would remain generally well distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for All Lands Within Range of Taxon

Some *Dudleya viscida* occurrences are threatened by development and by road construction and maintenance (California Native Plant Society 2001, California Department of Fish and Game 2002). However, vulnerability of occurrences on National Forest System lands appears to be low (Stephenson and Calcarone 1999). This species is included in a multi-agency conservation strategy for coastal sage scrub (USDA Forest Service and others 1997). By maintaining the current distribution of *Dudleya viscida* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Dudleya viscida* to suffer a decline in its overall distribution.

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Dudleya multicaulis

**Eriastrum densifolium ssp.
sanctorum**

Eriastrum densifolium ssp. sanctorum

Eriastrum densifolium (Benth.) H. Mason ssp. *sanctorum* (Milliken) H. Mason (Santa Ana River woolly-star)

Management Status

Federal: Endangered

California: Endangered

Heritage Rank: G4T1; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Eriastrum densifolium ssp. *sanctorum* is endemic to the Santa Ana River drainage and some of its tributaries. Its former range encompassed about 60 miles (97 km) along the Santa Ana River from Santa Ana in Orange County through Riverside County to the base of the San Bernardino Mountains in San Bernardino County, and up the washes of Lytle, Cajon, City, Pulnge and Mill Creeks (California Native Plant Society 2001; USDI Fish and Wildlife Service 2001). Currently, *Eriastrum densifolium* ssp. *sanctorum* occurs in one large extended, but fragmented, population mostly within San Bernardino County. Occurrences are recorded at Lytle Creek, along the floodplain of the Santa Ana River and along its tributaries between the city of Colton and the mouth of Santa Ana Canyon (Zembal and Kramer; California Native Plant Society 2001). Two occurrences are reported from Riverside County just south of the Riverside/San Bernardino county line (California Natural Diversity Database 2004) however these have not been located in recent years. The distance between extant occurrences comprises only 18 river miles, a 70% reduction from the taxon's historical distribution (Zembal and Kramer). At the time of listing, there were estimated to be 1,800 acres of occupied habitat (USDI Fish and Wildlife Service 1987). The California Natural Diversity Database (2004) reports 12 extant occurrences.

Distribution in the Planning Area

One former occurrence of *Eriastrum densifolium* ssp. *sanctorum* was located on an in-holding of the San Bernardino National Forest but was extirpated in 1993 by flooding. Potential habitat for this plant still occurs at the base of the San Bernardino Mountains along the Santa Ana River, Lytle, Cajon, and Mill Creeks (USDI Fish and Wildlife Service 2001). All known occurrences of *Eriastrum densifolium* ssp.

sanctorum are in drainages that flow from the San Bernardino National Forest (California Natural Diversity Database 2004; USDI Fish and Wildlife Service 2001).

Taxonomy and Natural History

Eriastrum densifolium ssp. *sanctorum* is a dicotyledon in the phlox family (Polemoniaceae). Five subspecies of *Eriastrum densifolium* are recognized, however a recent paper (Brunell, 1998) suggests that only ssp. *sanctorum* is distinct from the nominal sub-species. If this premise is accepted, there would be only two recognized subspecies, and the taxonomy (and listing status) of the occurrences at Lytle/Cajon would be in question.

Eriastrum densifolium ssp. *sanctorum* is densely woolly and is distinguished from the other subspecies by leaf morphology and by its corolla length, which is the longest of all the subspecies (Patterson 1993). Populations of *Eriastrum densifolium* ssp. *sanctorum* in Cajon and Lytle Creeks have shorter corollas than other populations and may be hybrids with subspecies *elongatum* (Burk and others 1989).

Eriastrum densifolium ssp. *sanctorum* is a short-lived perennial herb or subshrub that flowers June–September (California Native Plant Society 2001). The other species of *Eriastrum* in California are all annuals (Patterson 1993), whereas *Eriastrum densifolium* ssp. *sanctorum* typically lives for around 5 years and can reach 10 years (Burk and others 1989). The flowers release pollen before the stigma becomes receptive, ensuring outcrossing. Various pollinators, including bees, moths, flies, and hummingbirds, have been observed visiting the large (1.25 inches [32 millimeters]), funnel-shaped flowers (USDI Fish and Wildlife Service 2001). Primary pollinators include the giant flower-loving fly, hummingbirds, bumblebees, halictid bees, and digger bees (Dorsett and others 2001).

Seed dispersal appears to be limited; seeds typically land within a few inches of the parent plant. The seeds have a mucilaginous seed coat that sticks to soil particles when wetted (Burk and others 1989). However, seeds that are not dropped can remain on the plant in the capsule, forming a standing seed-bank that, during floods, may disperse farther than individual seeds could disperse. Seed viability is high (Burk and others 1989); in one study, seeds germinated with the first major rainfalls after summer (USDI Fish and Wildlife Service 2001). Seedlings have also been observed to flower in the first year, producing viable seeds in their second year (Chambers Group, Inc. 1993).

Eriastrum densifolium is a perennial with erect or spreading stems that are nearly glabrous to woolly. The glabrous to woolly leaves are 10-50 mm with generally 2-16 lobes. The corolla is funnel-shaped, blue or white, has a 15-35 mm tube, and 5-15 mm lobes. The stamens are equal, attached in the throat or upper tube, and are exerted. *Eriastrum densifolium* ssp. *sanctorum* has 2-6 leaf lobes, and the leaves are densely woolly. The corolla tube is greater than 30 mm (Patterson 1993).

Habitat Description

Eriastrum densifolium ssp. *sanctorum* grows on sandy or gravelly soils of alluvial fans, floodplain

terraces, and gravelly riverbeds in alluvial fan scrub, chaparral and coastal scrub at elevations of 490–2,000 ft (150–610 m) (California Native Plant Society 2001; California Natural Diversity Database 2004, Patterson 1993). *Eriastrum densifolium* ssp. *sanctorum* grows best on bare sandy substrates with low silt and clay components and does not appear to tolerate competition from introduced annual or perennial plants (Burk and others 1989). This open sandy habitat of *Eriastrum densifolium* ssp. *sanctorum* requires periodic natural flooding, scouring, and sediment deposition for renewal (Burk and others 1989). Flooding must be infrequent enough to allow the persistence of open shrublands, but frequent enough to maintain pioneer to intermediate successional phases (Zemba and Kramer 1988; Burke and Jones 1988). *Eriastrum densifolium* ssp. *sanctorum* inhabits gentle terrain with a low gradient and is associated with *Eriogonum californicum*, *Lotus scoparius*, *Dodecahema leptoceras*, *Croton californicus*, and *Lepidospartum squamatum* (California Natural Diversity Database 2004). This taxon tends to occupy areas that are relatively free of non-native species (Chambers Group Inc. 1993).

Habitat for *Eriastrum densifolium* ssp. *sanctorum* has been severely altered over the past century, and remains threatened today. Much of its original habitat has been destroyed by flood-control projects that altered natural flooding regimes. In addition, sand and gravel mining have resulted in extensive habitat loss.

Occurrence Status

Eriastrum densifolium ssp. *sanctorum* is distributed in highly restricted occurrences and is considered to be at risk of extirpation throughout its range (California Native Plant Society 2001). Approximately 90% of its original habitat has been eliminated by flood control projects, sand and gravel mining, urbanization, and farming (Zemba and Kramer 1985, USDI Fish and Wildlife Service 2001). Historically, this taxon occurred along a 60-mile (97-km) stretch of the Santa Ana River, but by 1989 it was confined to an 8-square-mile (21-square-km) area (Burk and others 1989). *Eriastrum densifolium* ssp. *sanctorum* was listed in 1987 because of the dramatic reduction in its range as well as immediate and tangible threats to the remaining populations (USDI Fish and Wildlife Service 1987). Since listing, the population has continued to decline, primarily because of urban development (USDI Fish and Wildlife Service 2001).

The table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Eriastrum densifolium* ssp. *Sanctorum* (Santa Ana River woolly-star)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1	~50 in 1985; 110 in 1994	1994	SE edge of town of Highland, City Creek Floodplain, E side of percolation basin. On both sides of Boulder Ave. On alluvial bench w/ gravelly soil. In alluvial fan scrub w/ <i>Eriogonum fasciculatum</i> , <i>Platanus racemosa</i> , <i>Juniperus californica</i> , <i>Lepidospartum squamatum</i> , <i>Senecio flaccidus</i> , <i>Schismus barbatus</i> , <i>Yucca schidigera</i> . Highly disturbed. Plants only in areas not affected by ground disturbance. ORVs and development are threats. PVT.	SBD
2	U	1927	Black Star Canyon Quadrangle, possibly near JCT of Weir Canyon Rd. and Riverside Freeway. PVT. Possibly extirpated.	Orange
3	444 in 1988	1988	W side of Lytle Creek Wash, S of Highland Ave. On sandy soil in Riversidian alluvial fan sage scrub. w/ <i>Eriogonum fasciculatum</i> , <i>Croton californicus</i> , <i>Gutierrezia bracteata</i> , <i>Senecio douglasii</i> , <i>Lotus scoparius</i> . This population may be a hybrid swarm of <i>E. d. sanctorum</i> and <i>E. d. elongatum</i> acc. to J. Wheeler. More studies needed. Area completely surrounded by trailer parks, railroad, stables, etc. Construction of RTE 30 Freeway would destroy many plants. PVT.	SBD

4	U	1952	3.8 mi. NW of JCT of Highland Ave. and RTE 66 (now Hwy 215). Cajon Wash populations may be hybrid swarm of <i>E. d. sanctorum</i> and <i>E. d. elongatum</i> . More studies needed. Land owner: U.	SBD
5	1000's in 1984-1986; 330 in 1992	1992	Santa Ana River Wash; floodplain of the Santa Ana River, N of Redlands. Huge area of subpopulations, from approx. Norton Air Force Base E to Greenspot Rd. 250 ft. W of Orange St. and behind gun range, 200 ft. W of Orange St. In alluvial fan sage scrub, w/ <i>Eriogonum californicum</i> , <i>Lotus scoparius</i> , nonnative grasses. Also found w/ <i>Dodecahema leptoceras</i> . Part highly disturbed by ORVs, dumping, bulldozing, and exotics. Portion extirpated at Borrow site for HWY 30 construction. Some plants transplanted as mitigation for HWY 30 construction. Fire in 1988 burned some plants; water tanker damaged some plants. Rehab work planned. Land owners: San Bernardino County Flood Control/BLM.	SBD

10	30 in 1984 and 1987; U in 1988; 60 in 1992 (30 mature, 30 seedlings)	1992	Santa Ana River Canyon, 0.6 air mi. N of mouth of Morto N Canyon, between gaging station and powerhouse. Mapped along E side of the canyon along road just S of gaging station. w/ <i>Eriogonum fasciculatum</i> , <i>Lepidospartum squamatum</i> , <i>Bebbia juncea</i> , <i>Encelia farinosa</i> , <i>Senecio douglasii</i> . Seven Oaks dam to be located just upstream, altering natural flood regime. Increased recreational use could follow. Likely to be impacted or eliminated by dam construction. Part of land owned by So. Cal. Edison (?). PVT in SBNF.	SBD
15	0	1985	Vicinity of Devore. < 50 plants seen 'recently,' but population entirely disced on 5/2/85. Land owner: U.	SBD
17	U	1988	Mill Creek, near Santa Ana Wash. ca. 1 mi. NE of Mentone, along Mill Creek. 0.3 mi. W of Garnet St. Recently exposed sandy substrate on alluvial fan. Construction of the Seven Oaks dam will modify the flood regime. Land owner: U.	SBD

18	16 in 1987	1987	W side of Cajon Blvd., 0.3 mi. N of Institution Rd. Close to Cajon Blvd., brush clearing along shoulder of road. Mixed chaparral, alluvial fan scrub of chamise, scalebroom and buckwheat. A few seedlings extending into brush-cleared area. Land owner: U.	SBD
19	55 in 1967; 64 in 1988	1988	W branch of Lytle Creek Wash; immediately E of Frisbie Park and immediately S of Highland Ave. Along Rialto Corp. Boundary. Semi-stabilized old floodplain on sand lens's containing bars and lenses of cobble, gravel, and sand. w/ <i>Lepidospartum squamatum</i> , <i>Eriogonum fasciculatum</i> , <i>Yucca whipplei</i> , etc. This population may be a hybrid swarm of ssp. <i>densiflorum</i> and ssp. <i>sanctorum</i> . More taxonomic work needed. Sand and gravel mining just upstream. Rte 30 freeway existing alignment goes through most of population. Land owner: CalTrans?	SBD

20	20 in 1987	1987	<p>S side of Baseline Ave., W of Lytle Creek Wash.</p> <p>Southernmost extent of Lytle Creek populations. Just S of here, creek enters a detention basin and is thereafter channelized to confluence w/ Santa Ana River. Highly disturbed area w/ <i>Adenostoma fasciculatum</i>, <i>Eriogonum fasciculatum</i>. Lytle and Cajon Creek Wash populations may be hybrids of ssp. <i>densiflorum</i> and ssp. <i>sanctorum</i>. Aggregate mining and flood control modifications. Land owner: U.</p>	SBD
21	2 in 1994	1994	<p>Santa Ana River Wash, just W of Riverside Ave. bridge, S of Rialto. Sheep grazing, ORV use, occasional grading. One plant is right under the bridge; the second is 200 m downstream. Elevated alluvial fan w/ dense vegetation. w/ <i>Eriogonum fasciculatum</i>, <i>E. thurberi</i>, <i>Croton californica</i>, <i>Heterotheca sessiliflora</i>, <i>Cryptantha muricata</i>. Sandy soils. Sheep grazing, ORV use, occasional grading. Land owner: Riverside Co. Flood Control.</p>	SBD

22	3 in 1994	1994	<p>Santa Ana River Wash, ca. 0.8 mi. SW of Riverside Ave. bridge, Riverside. In wash between Market St. and Riverside Ave. Elevated alluvial fan w/out dense vegetation. w/ <i>Eriogonum fasciculatum</i>, <i>E. thurberi</i>, <i>Croton californica</i>, <i>Heterotheca sessiliflora</i>, <i>Cryptantha muricata</i>. Sandy soils. Sheep grazing, ORV use, occasional grazing. Land owner: Riverside County Flood Control.</p>	RIV
23	200 in 1994	1994	<p>Santa Ana River Wash, ca. 0.5 mi. W of Mount Vernon Ave., Colton. Mapped as 3 polygons along alluvial fan that feeds into the wash S of the SP RR yards and E of Veterans Park. Stream drainage of alluvial fan. w/ <i>Lepidospartum squamatum</i>, <i>Eriodictyon trichocalyx</i>, <i>Ambrosia acanthocarpa</i>, <i>Lessingia glandulifera</i>, <i>Erodium cicutarium</i>, weedy grasses. Sandy soils. Potential habitat disturbance from proposed transmission line and substation project. Impacts may be avoided if transmission lines span the alluvial wash. Land owner: City of Colton.</p>	SBD

24	1 in 1994	1994	Santa Ana River Wash, ca. 0.2 mi. S of Hwy 60 and W of Fairmont Park Gold Course, Riverside. Elevated alluvial fan w/put dense vegetation. w/ <i>Eriogonum fasciculatum</i> , <i>E. thurberi</i> , <i>Croton californica</i> , <i>Heterotheca sessiliflora</i> , <i>Cryptantha muricata</i> . More plants in a wetter year? Land owner: Riverside County Flood Control.	RIV
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- *U* = Unknown
- * = an occurrence number has not been assigned
- *SBNF* = San Bernardino National Forest
- *ANF* = Angeles National Forest
- *SBD* = San Bernardino County
- *LA* = Los Angeles County
- *RIV* = Riverside County

Threats

The main threat to *Eriastrum densifolium* ssp. *sanctorum* is elimination of habitat by flood control projects and development of floodplain habitat (USDI Fish and Wildlife Service 1987, 2001). Other threats are associated with increasing urbanization; these include vehicle use off of classified roads, sand and gravel mining, grazing, and non-native plants (California Native Plant Society 2001; California Natural Diversity Database 2004; USDI Fish and Wildlife Service 2001). The Seven Oaks Dam upstream from the Santa Ana River populations, now completed, may alter flood regimes in the Santa Ana River with devastating long-term effects on this species.

There are no known occurrences of *Eriastrum densifolium* ssp. *sanctorum* on National Forest System lands; however, all occurrences are in drainages that originate on the San Bernardino National Forest. The highly specific habitat requirements for *Eriastrum densifolium* ssp. *sanctorum* establishment and growth are maintained by a natural flood regime that periodically deposits sand (Burk and others 1989, USDI Fish and Wildlife Service 2001). Watershed management on National Forest Service lands upstream of occurrences, specifically management of the Lytle, Cajon, Mill, Plunge, and City watersheds, has the potential to affect occupied habitat in several creeks around Redlands. Proposed activities in these drainages will be evaluated for downstream effects on populations of *Eriastrum densifolium* ssp. *sanctorum* (USDI Fish and Wildlife Service 2001).

Conservation and Management Considerations

The primary short-term conservation strategy for this species is to perform focused surveys within the relatively small amount of alluvial fan scrub on the SBNF to determine whether suitable habitat on NFS is occupied. Of equal importance is to manage NFS land watersheds in a manner consistent with the conservation of this species.

The following is a prioritized list of conservation practices that should be considered for *Eriastrum densifolium* ssp. *sanctorum*:

- Perform focused surveys of all Alluvial fan scrub on the SBNF for this species and associated rare plants, along with the endangered San Bernardino kangaroo rat.
- Avoid and minimize any activities on the SBNF that will adversely affect downstream habitat for *Eriastrum densifolium* ssp. *sanctorum*.
- On SBNF, if located, survey all new occurrences of *Eriastrum densifolium* ssp. *sanctorum* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Eriastrum densifolium* ssp. *sanctorum* to document any new-found occurrences on SBNF.
- Map known and new occurrences of *Eriastrum densifolium* ssp. *sanctorum* in the area using NRIS data collection standards, and incorporate these occurrences into the SBNF Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Eriastrum densifolium ssp. *sanctorum* is a narrow endemic endangered species that occurs only in washes and alluvial terraces downstream from the SBNF, with suitable habitat but no known occupied habitat on NFS lands. It is threatened by any activities that can alter hydrology or fluvial geomorphology. Because watershed management can have profound effects on downstream hydrology and fluvial morphology, this species may be threatened by impacts associated with Forest Service management.

Based on this analysis, *Eriastrum densifolium* ssp. *sanctorum* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

Eriastrum densifolium ssp. *sanctorum* is listed as Endangered under the Endangered Species Act of 1973, as amended, which assures that on NFS lands, any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the U.S. Fish and Wildlife Service.

No populations of *Eriastrum densifolium* ssp. *sanctorum* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Eriastrum densifolium* ssp. *sanctorum*.

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Dudleya viscida

Eriastrum hooveri

Eriastrum hooveri

Eriastrum hooveri (Jeps) Mason (Hoover's eriastrum)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3 S3.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-3

General Distribution

Eriastrum hooveri is found in the Temblor Range and adjacent San Joaquin Valley, ranging from San Benito and Fresno counties south to Kern and Santa Barbara counties (California Native Plant Society 2001). Most occurrences are grouped into four meta-populations, large areas within which *Eriastrum hooveri* occurs as scattered groups of plants (USDI Fish and Wildlife Service 1998).

Distribution in the Planning Area

Six occurrences of *Eriastrum hooveri* are found on the Mount Pinos Ranger District of the Los Padres National Forest. They are part of a metapopulation that covers the Carrizo Plain, Elkhorn Plain, Temblor Range, Caliente Mountains, Cuyama Valley, and Sierra Madre Mountains. The occurrences are located in the foothills of Sierra Madre Ridge, just south of Cuyama Valley in Castro, Goode, and Tennison Canyons (Stephenson and Calcarone 1999). Other occurrences are adjacent to National Forest System lands in and around the confluence of Santa Barbara Canyon and the Cuyama River, on private land and on land administered by the Bureau of Land Management (USDA Forest Service 2000).

Taxonomy and Natural History

Eriastrum hooveri is a dicot in the phlox family (Polemoniaceae). It is distinguished from other eriastrums within its range by a combination of floral characters, in particular, the small flower size (Patterson 1993).

Eriastrum hooveri is an annual herb that generally blooms April–July (California Native Plant Society 2001). Seedlings emerge between mid-winter (January) and early spring (April) and are dependent on rainfall during this time for successful establishment (Holmstead and Anderson 1998). Plant density is variable between sites and years, with higher densities observed in years of higher precipitation (USDA Forest Service 2000).

Habitat Description

Eriastrum hooveri is found at elevations of 165–3,000 feet (50–915 meters) in a wide variety of plant communities, including pinyon-juniper woodland, chenopod scrub, and valley and foothill grassland (California Native Plant Society 2001). It grows on sandstone outcrops and shale banks in the Temblor Range (Twisselmann 1967), and on mound tops in sparsely vegetated alkaline alluvium fans. The ideal habitat for this species consists of stabilized silty to sandy soils, low cover of competing herbaceous vegetation, and the presence of cryptogamic crust (a layer of moss, lichen, and algae), although it has also been found on loamy soils with dense vegetation and no cryptogamic crust (USDI Fish and Wildlife Service 1998). On the Los Padres National Forest, *Eriastrum hooveri* occurs in juniper woodland, often in association with California buckwheat (*Eriogonum fasciculatum*) (Stephenson and Calcarone 1999).

Occurrence Status

Eriastrum hooveri is considered to be in danger of extirpation in a portion of its range, but it is found in sufficient numbers and widely enough distributed that the potential for extinction is considered to be low at this time (California Native Plant Society 2001). Three of the Los Padres National Forest occurrences were visited in 1998 and found to be extant (USDA Forest Service 2000). Because accurate estimates of population size were not possible, it is not possible to estimate population trends for these occurrences. Because habitat capability and land management practices at these locations have not been altered for many years, it is reasonable to assume that the populations are stable (USDA Forest Service 2000).

Threats

No specific threats to *Eriastrum hooveri* on National Forest System lands have been identified, and vulnerability of populations is considered to be low (Stephenson and Calcarone 1999, USDA Forest Service 2000). All of the occurrences are found on or in association with dirt roads. These dirt roads are not part of the Los Padres National Forest road system and are no longer maintained by the Forest Service. The existing setting makes it difficult for the general public to access these roads, but some use occurs from time to time, mostly from range permittees and adjoining landowners (USDA Forest Service 2000). The occasional use that occurs on these roads may affect *Eriastrum hooveri*. The nature of the impact is dependent on the season of use and the intensity of use. Occasional use between January and June results in physical impacts to plant parts and may result in mortality or decreased seed production (USDA Forest Service 2000). Monitoring of Los Padres National Forest occurrences showed that plants were absent from the area affected by tire tracks (i.e., the ruts) but plants were found in the median strips and along either side of the monitored roads (Foster 1998). Occasional use from

July to December likely has little direct impact on the affected occurrences (USDA Forest Service 2000). Other studies have found that *Eriastrum hooveri* appears to be somewhat tolerant of disturbance (Hinshaw et al. 1998, Holmstead and Anderson 1998). In areas of dense vegetation, the species may benefit from light to moderate soil disturbance if it reduces the abundance of competing non-native plants (USDA Forest Service 2000).

Conservation and Management Considerations

The recovery plan for *Eriastrum hooveri* lists no objectives that are specific to National Forest System lands, but the recovery strategy does recognize that the recovery of this species can be accomplished using public lands and other areas already dedicated for conservation (USDI Fish and Wildlife Service 1998). This requires that habitat on public land not be subject to conversion to agricultural uses, oil development, or other incompatible land uses. Livestock grazing was not listed as a threat to this species and is not considered an incompatible land use (USDI Fish and Wildlife Service 1998).

The recovery plan also recommends that monitoring of representative sites within each metapopulation should continue to determine trends in population numbers and habitat suitability (USDI Fish and Wildlife Service 1998). To contribute to this effort, it is recommended that monitoring of population density should be conducted at two of the occurrences found on National Forest System lands. If population densities at the monitoring sites decline over 3 or more successive years of above-average rainfall that are separated by 1 or more years of below-average rainfall, then management strategies and recovery needs should be reassessed (USDI Fish and Wildlife Service 1998).

Evaluation of Current Situation and Threats on National Forest System Lands

Eriastrum hooveri has been delisted from threatened status. Occurrences on National Forest System land are not currently adversely affected by current and anticipated land uses. Most occurrences of *Eriastrum hooveri* are located off of National Forest System land; i.e., its distribution is largely peripheral to the Los Padres National Forest.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Eriastrum hooveri is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the

alternatives would not result in a substantial change in conditions for this taxon. *Eriastrum hooveri* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Eriastrum hooveri* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Eriastrum densifolium ssp. sanctorum	Eriastrum luteum
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Eriastrum luteum

Eriastrum luteum (Benth.) H. Mason (Yellow-flowered eriastrum)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Eriastrum luteum is endemic to Monterey and San Luis Obispo counties (Patterson 1993). *Eriastrum luteum* is rare in the Santa Lucia Mountains west of Paso Robles and locally common east of Santa Margarita from near Salinas River to the west base of the La Panza Range (CalFlora 2002, Hoover 1970).

Distribution in the Planning Area

Eriastrum luteum is not known to occur on National Forest System land but is suspected to occur on the Monterey Ranger District of the Los Padres National Forest due to the presence of potential habitat within 5 to 10 miles of known occurrences on Fort Hunter – Liggett and other neighboring properties (Painter 2004). *Eriastrum luteum* is also suspected to occur on the Santa Lucia Ranger District in the area to the west of Hwy 101 and south of Hwy 58 due to collections from Camp Roberts area (Painter 2004).

Taxonomy and Natural History

Eriastrum luteum is a dicot in the phlox family (*Polemoniaceae*). The golden yellow corolla readily separates this species of eriastrum from all the others found in Monterey and San Luis Obispo counties. Flowering in *Eriastrum luteum* occurs in May and June.

Habitat Description

Eriastrum luteum is found away from the immediate coast in broadleaved upland forest, chaparral, and cismontane woodland on dry, sandy or gravelly substrates at an elevation of 950 to 3,280 feet (290 to 1,000 meters) (California Native Plant Society 2001, Matthews 1997).

Occurrence Status

Within its narrow range, *Eriastrum luteum* is rare to locally common (Hoover 1970, Patterson 1993).

Threats

The California Native Plant Society (2001) considers *Eriastrum luteum* to be endangered in portions of its range; however, no specific threats are listed or described.

Conservation and Management Considerations

More information is needed to determine if *Eriastrum luteum* occurs on the Los Padres National Forest.

Evaluation of Current Situation and Threats on National Forest System Lands

Eriastrum luteum is not known to occur on National Forest System lands but based on occurrences located just east of the Los Padres National Forest on habitats that may be present on the national forest it is assumed that potential habitat may exist on the Forest.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the plan area.

Viability Outcomes

No populations of *Eriastrum luteum* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Eriastrum luteum*.

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Eriastrum hooveri

**Ericameria cuneata var.
macrocephala**

Ericameria cuneata var. macrocephala

Ericameria cuneata (Gray) McClatchie var. *macrocephala* Urbatsch (Laguna Mountains goldenbush)

Management Status

Federal: None (historically on Sensitive list)

California: Endangered (California Natural Diversity Database)

Heritage Rank: G5T2, S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Ericameria cuneata var. *macrocephala*, Laguna Mountains goldenbush, is endemic to the Laguna Mountains of San Diego County (Brown & Keil 1993). Although its range is limited, occurrences are fairly common along the crest and desert-side slopes of these mountains (Stephenson and Calcarone 1999).

Distribution in the Planning Area

Ericameria cuneata var. *macrocephala* occurs on and adjacent to the Cleveland National Forest (California Natural Diversity Database 2004). Most of the occurrences are located on public lands, which are relatively well protected, including Bureau of Land Management and state park lands.

Taxonomy and Natural History

Ericameria cuneata var. *macrocephala* is a shrub that blooms from September through December (California Native Plant Society 2001). Plants are 1-10 dm, glabrous, and more or less gland-dotted. Leaves are 12-20 mm long and 6-14 mm wide, obovate in shape, with petiole-like bases. Inflorescence heads are discoid, 9-12 mm long, 6-10 mm in diameter having 36-70 flowers per head (Brown & Keil 1993).

Habitat Description

Ericameria cuneata var. *macrocephala* grows on granitic soils within chaparral at elevations of 3,900 to 6,100 feet (1,195-1,850 meters) (California Native Plant Society 2001) and around rocky knolls in montane chaparral (Reiser 1994). Soils mapped for Garnet Peak are Sheephead rocky fine sandy loams.

Occurrence Status

The California Natural Diversity Database reports four known occurrences of *Ericameria cuneata* var. *macrocephala* (California Natural Diversity Database 2004). Three of the four occurrences are on Cleveland National Forest lands at Garnet and Monument Peak and along Noble Canyon trail south of Noble Canyon. The remaining occurrence is a non-specific location along Sunrise Highway (S1), possible occurring on the Cleveland National Forest.

OCCURRENCE DATA of *Ericameria cuneata* var. *macrocephala* (Laguna Mountains goldernbush) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
1	*	U	1974	Monument Peak/CNF	SD
2	*	U	1927	Garnet Peak/CNF	SD
3	2-1	10	1994	Noble Canyon Trail / CNF	SD
3	2-2	10+	1994	Noble Canyon Trail / CNF	SD
4	*	U	1974	Sunrise Highway / CNF? Private?	SD

- *U* = Unknown.
- *an occurrence number has not been assigned.*
- *CNF* = Cleveland National Forest
- *SD* = San Diego County

Threats

Cleveland National Forest occurrences of *Ericameria cuneata* var. *macrocephala* at Garnet Peak and Monument Peak are well protected on rock crevices with no known threats. However, in 2002, the

Garnet and Pines Fire may have burned over these occurrences. The responses of this plant to fire are unknown. The Noble Canyon occurrence is within a grazed allotment, although cattle would not access rock cliffs where plants occur.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Ericameria cuneata* var. *macrocephala*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Monitor post-fire recovery.
- Allow wildland fires to freely burn on through populations. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks and roads, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. The use of hand line for fuel break construction is preferred.

Evaluation of Current Situation and Threats on National Forest System Lands

Ericameria cuneata var. *macrocephala* grows in generally inaccessible places and is fairly common within its limited range. Some populations may have been affected by wildfire in 2000. There are no substantial threats to this species from Forest Service activities identified at this time.

Based upon the above analysis this species has been assigned the following threat category:

4. Endemic, but fairly common within its range, in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Ericameria cuneata var. *macrocephala* is distributed in a limited number of occurrences but is not considered to be endangered at this time (California Native Plant Society 2001). Populations on National Forest System lands appear to be stable, and nearly all populations are well protected (Stephenson and Calcarone 1999). Vulnerability to this species on National Forest System lands is considered to be low (Stephenson and Calcarone 1999).

The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Ericameria cuneata* var. *macrocephala*. Variations in land use designations would not alter this current situation, and the various emphases of the alternatives would not result in a substantial change in conditions for *Ericameria cuneata* var. *macrocephala*. *Ericameria cuneata* var. *macrocephala* would remain generally well

distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for All Lands within Range of Taxon

Same as above as most of the occurrences are located on public lands, which are relatively well protected. By maintaining the current distribution of *Ericameria cuneata* var. *macrocephala* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Ericameria cuneata* var. *macrocephala* to suffer a decline in its overall distribution.

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Eriastrum luteum

Ericameria palmeri var.
palmeri

Ericameria palmeri var. palmeri

Ericameria palmeri (Gray) Hall ssp. *palmeri* (Palmer's goldenbush)

Management Status

Federal: None

California: None

Heritage Rank: G4T2T3, S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 3-2-1

General Distribution

Ericameria palmeri ssp. *palmeri* is known from six occurrences in San Diego County, although it is more widespread in Baja California, Mexico (Brown & Keil 1993; California Native Plant Society 2001). Reiser (1994) lists 11 occurrences, five of which are either extirpated or on land proposed for development projects.

Distribution in the Planning Area

Ericameria palmeri ssp. *palmeri* is not known to occur on National Forest System lands, and even though it has been reported as having the potential to occur on the Cleveland National Forest (Stephenson and Calcarone 1999), it is highly unlikely.

Taxonomy and Natural History

Ericameria palmeri ssp. *palmeri* is a stout, evergreen shrub of 1-4 dm. Leaves are 20-40 mm and often curved. The involucre is 5-6.5 mm long with 4-10 ray flowers (Brown & Keil 1993). Plants flower from July to November (California Native Plant Society 2001). Broad-scaled Palmer's goldenbush (*E. p.* ssp. *pachylepis*) also occurs in San Diego County, but it differs from Palmer's goldenbush in plant stature and leaf length (Brown & Keil 1993).

Habitat Description

Ericameria palmeri ssp. *palmeri* occurs seasonally in coastal drainages, wet or moist areas in coastal sage scrub, riparian scrub, and chaparral communities (Reiser 1994; California Native Plant Society 2001). Plants can occasionally occur on hillsides at higher elevations of north-facing slopes (Reiser 1994). Las Posas fine sandy loam is mapped for the riparian site at Jamacha Road, while the hillside locale near Sequan Indian Reservation is Vista coarse sandy loam (Reiser 1994).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports four occurrences for *Ericameria palmeri* ssp. *palmeri* (California Natural Diversity Database 2004). All these occurrences are on private or lands of unknown ownership. Two of these records are old documentations needing current population status verification. The other populations are recent records with several to 50 shrubs per occurrence (Natural Diversity Database 2004). Reiser (1994) lists 11 locations, five of which are either extirpated or on land proposed for development projects.

Threats

Ericameria palmeri ssp. *palmeri* may be threatened by development, as it occurs at the periphery of urban sprawl (Reiser 1994).

Conservation and Management Considerations

There are no conservation measures recommended for *Ericameria palmeri* ssp. *palmeri* as there are no documented occurrences on National Forest System lands.

Evaluation of Current Situation and Threats on National Forest Systems Lands

No populations of *Ericameria palmeri* ssp. *palmeri* are known to occur on National Forest System lands and it is highly unlikely that this low elevation riparian-associated species would occur on National Forest System lands.

Based upon the above analysis this species has been assigned the following threat category:

1. Not found in the plan area.

Viability Outcomes

No populations are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in the southwestern portion of the Descanso Ranger District. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore,

no such analysis is presented for *Ericameria palmeri* ssp. *palmeri*.

Ericameria palmeri ssp. *palmeri* is distributed in several highly restricted occurrences in California and is considered to be in danger of extirpation in portions of its range (Reiser 1994; CNPS 2001).

Ericameria palmeri ssp. *palmeri* is reportedly present in significant numbers scattered along the Otay River drainage and appears to tolerate ground disturbance from local dredging operations, but identification of the plants at this location needs to be confirmed (Stephenson and Calcarone 1999).

There is potential for extirpation of *Ericameria palmeri* ssp. *palmeri* in San Diego County because it occurs adjacent to urban development (Reiser 1994). This shrub appears hardy and should be considered for native plantings (Reiser 1994). More information is needed about this species.

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**Ericameria cuneata var.
macrocephala**

Erigeron breweri var. jacinteus

Erigeron breweri var. jacinteus

Erigeron breweri A. Gray var. *jacinteus* (H.M. Hall) Cronq. (San Jacinto Mountains daisy)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G4G5T3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Erigeron breweri var. *jacinteus* is endemic to the eastern San Gabriel, and San Jacinto mountains of Los Angeles, and Riverside counties, California (Nesom 1993). There is suitable habitat but there are no records for the eastern San Gabriel Mountains in San Bernardino County.

Distribution in the Planning Area

Erigeron breweri var. *jacinteus* occurs on the Angeles and San Bernardino national forests. There are known occurrences at Mt. Baden-Powell and Little Baldy in the San Gabriel Mountains and at Tahquitz Peak and upper Snow Creek in the San Jacinto Mountains (CalFlora 2002).

Taxonomy and Natural History

Erigeron breweri is a dicotyledon in the sunflower family (*Asteraceae*). This perennial, rhizomatous herb flowers between June-September (California Native Plant Society 2001).

Erigeron breweri is a 7-75 cm perennial from woody roots and a slender-branched caudex. The plant is generally not wiry or brittle and is generally densely short-spreading-hairy. The cauline leaves are 5-40 mm and are linear to oblanceolate, evenly sized, and evenly spaced. The inflorescence has heads that are generally radiate, 8-15 mm in diameter. The phyllaries are strongly graded in 3-5 series and have tips that are generally like the body. There are 12-45 ray flowers that are 4-7 mm. The ligules are white to pink or drying blue and are weakly coiled. There are 22-46 pappus bristles.

Erigeron breweri var. *jacinteus* has 7-15 cm stems that are prostrate to decumbent. The leaves are 5-12 mm and have 0.2-0.4 mm hairs. The inflorescence is characterized by densely glandular phyllaries (Nesom 1993).

Habitat Description

Erigeron breweri var. *jacinteus* inhabits rocky areas of subalpine coniferous forest and upper montane coniferous forest between 2700-2900 m.

Occurrence Status

CalFlora (2002) lists a few occurrences in Los Angeles and Riverside counties. There is no information on population size or trends, and none of the occurrences have been observed in recent years.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Erigeron breweri* var. *jacinteus* (San Jacinto Mountains daisy)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
1204027	U	U	Taquizt rocky ridges and peaks near San Jacinto Mountains. SBNF	RIV
1206041	U	1928	Tahquitz Peak, San Jacinto Mountains. San Jacinto Wilderness-SBNF.	RIV
1206005	U	1922	Little Baldy summit. San Gabriel Mountains. ANF.	LA
1323303	U	1971	Mt. Baden-Powell. S ridge of summit. San Gabriel Mountains. ANF.	LA

*	U	1909	San Jacinto Mtns, Upper Snow Creek, South Branch 9,500', to ridge and SW to upper meadows. C. Wilder coll. (State Park?)	RIV
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- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *LA = Los Angeles County*
- *RIV = Riverside County*

Threats

Occurrences in the San Jacinto Wilderness Area are protected from many land uses by the wilderness designation of this area; however, some plants may be affected by rock-climbing activities (USDA Forest Service 2003). Rock climbing impacts from outfitter guides and groups are analyzed at the project level prior to issuance of a special use permit.

Snow Creek is a popular technical winter mountaineering route March through May, however habitat is under snow and ice during these months and no substantial impacts are likely.

Conservation and Management Considerations

The primary conservation strategy for this species is to improve the knowledge of its distribution, to determine whether rockclimbing and/or mountaineering is impacting this species, and to protect occurrences as needed. The following is a list of conservation practices that should be considered for *Erigeron breweri* var. *jacinteus*:

- Survey all recorded occurrences determine whether *Erigeron breweri* var. *jacinteus* is still extant at these locations and to assess current threats.
- Survey all new occurrences of *Erigeron breweri* var. *jacinteus* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Survey all popular climbing routes in suitable habitat within the range of this species. Where impacts to this species are observed, implement protective measures as needed.
- Collect a herbarium voucher specimen of *Erigeron breweri* var. *jacinteus* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Erigeron breweri* var. *jacinteus* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Erigeron breweri var. *jacinteus* is rare (or badly under-collected) and narrowly distributed. While some of the recorded occurrences may be vulnerable to identified threats (primarily rockclimbing and mountaineering), these impacts are not expected to be widespread across available habitat. Where impacts are detected, protective measures are recommended. Most of the suitable habitat for this species is inaccessible except through technical climbing, and most is in designated wilderness.

Based on this analysis, *Erigeron breweri* var. *jacinteus* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Erigeron breweri var. *jacinteus* is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Erigeron breweri* var. *jacinteus* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Erigeron breweri* var. *jacinteus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Erigeron breweri* var. *jacinteus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Ericameria palmeri var.
palmeri**

Erigeron parishii

Erigeron parishii

Erigeron parishii A. Gray (Parish's daisy)

Management Status

Federal: Threatened; Critical Habitat designated December 24, 2002 (67 FR 78569).

California: None

Heritage Rank: G2; S2.1 (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 1B; R-E-D Code 2-3-3

Critical Habitat (CH) for *Erigeron parishii* was designated by the USFWS on December 24, 2002 (67 Federal Register 78569) (U.S. Fish and Wildlife Service 2002). In determining which areas to designate as CH the USFWS considers those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These features are termed Primary Constituent Elements (PCEs) and they are summarized in the final rule (U.S. Fish and Wildlife Service 2002).

General Distribution

Erigeron parishii is endemic to the eastern San Bernardino Mountains, where it is distributed within a 35-mile (56-km) belt of carbonate habitat. It is known from at least 40 occurrences at the eastern end of the San Bernardino Mountains and into the Little San Bernardino Mountains of San Bernardino County (California Natural Diversity Database 2004). However, some of the eastern occurrences need confirmation on the reported localities. *Erigeron parishii* has been reported from the eastern Mojave Desert, but these reports appear to be erroneous (Sanders 2002). Occurrences are located mostly on National Forest System lands, but are also on BLM, State, private, and (historically) on National Park Service lands.

Distribution in the Planning Area

Most occurrences of *Erigeron parishii* are on or adjacent to the San Bernardino National Forest. Of 1,024 total mapped acres of occupied habitat, 655 acres (64%) are on federal land under mining claim, 99 acres (10%) are on unclaimed federal land, and 270 acres (26%) are on private land; approximately

two-thirds of the federal acres (517 out of 754 federal acres) are on the San Bernardino National Forest, with the remainder under Bureau of Land Management Desert District management, and a small isolated historic occurrence reported from Joshua Tree National Park (USDA Forest Service 2003).

Taxonomy and Natural History

Erigeron parishii is a dicotyledon in the sunflower family (Asteraceae). It is sometimes confused with fleabane daisy (*Erigeron utahensis*), a plant found on carbonate substrates in the mountains of the Mojave Desert and in Utah, Colorado, and Arizona (U.S. Fish and Wildlife Service 1994). It has also been confused with limestone daisy (*Erigeron uncialis* var. *uncialis*), however limestone daisy does not occur within the range of Parish's daisy.

Erigeron parishii is a perennial herb that generally blooms between May–June (California Native Plant Society 2001). During some years with significant summer rainfall, plants have been observed flowering into July and August (Sanders 2002)

Erigeron parishii is a 10-35 cm perennial from a thick taproot and branched caudex. There may be few or numerous stems on each plant, but mature plants generally have at least 20 stems. The stems are faintly zig-zagged. *Erigeron parishii* is 0-few branched near the mid-stem. The plant is silvery hairy, especially above. The basal leaves are 3-6 cm, more or less linear and often absent by flowering. The cauline leaves are reduced. The older leaves seem to lose their pubescence, appearing greener than other parts of the plant. The inflorescence is characterized by 1-10 solitary heads, 10-15 mm in diameter, on bracted, almost leafy peduncles. A single mature plant may contain 50 heads. The phyllaries are more or less equal and sessile-glandular. There are 30-55 ray flowers. The corollas are 6-13 mm, and the ligules are bluish to pink to white and coiled. The fruit are 4-ribbed and more or less hairy. There are 18-26 pappus bristles (Nesom 1993, Sanders 2002).

Through a mitigation agreement, Pleuss-Staufer, Inc. (now OMYA, California, Inc.) agreed to fund a horticultural study of *Erigeron parishii* and *Eriogonum ovalifolium* var. *vineum* by Rancho Santa Ana Botanic Garden. Rancho Santa Ana Botanic Garden found that *Erigeron parishii* was fairly easy to propagate from seeds and cuttings, but seed propagation appears to be more successful. Seed germination varied between 50-63%. In 1990, eighty-one *Erigeron parishii* individuals were planted at a site along the haul road to the White Knob Quarry. These plants were watered twice each week. Many of the transplants have survived and have produced flowers and seeds (Rancho Santa Ana Botanic Garden 1991).

Habitat Description

Erigeron parishii typically inhabits pinyon woodlands, pinyon-juniper woodlands, blackbrush scrub and desert washes at elevations of 4,000–6,400 feet (1,220–1,950 meters) (U.S. Fish and Wildlife Service 1994). It usually grows on rocky slopes, active washes, and outwash plains on substrate derived from limestone or dolomite (U.S. Fish and Wildlife Service 1997). Some occur on a granite/limestone

interface characterized by a granitic parent material overlain with an outwash of limestone materials (U. S. Fish and Wildlife Service 1994). The southeastern occurrences near Pioneertown grow on a substrate described as quartzite-monzonite (USDA Forest Service 2003). When *Erigeron parishii* occurs on slopes, plants are generally clustered around rocks. *Erigeron parishii* is closely associated with *Eriogonum ovalifolium* var. *vineum*, *Chrysothamnus nauseosus*, *Pinus monophylla*, and *Coleogyne ramosissima* (Bennett 1979).

Carbonate and limestone outcrops and their derived soils are found in several east-west trending bands over approximately 20 miles (32 km) of the northern desert-facing slopes in the San Bernardino Mountains. The outcrops occur from White Mountain to Blackhawk Mountain and southeast to Tip Top Mountain. Elevations range from 4,000–8,000 ft (1,219–2,434 m). Carbonate habitats are also found outside of the eastern Transverse Ranges on the mountain ranges in the Mojave Desert and southwestern Great Basin, although this species is endemic to the eastern San Bernardino Mountains.

Carbonate habitats are characterized by naturally low vegetation productivity and open structure. As a result, carbonate habitats support little livestock grazing or timber and fuels management activities. However, there is prolonged recovery time required following disturbance on carbonate soils; the effects of such activities where they have occurred can persist long after the action is completed (Forest Service 2003).

Large-scale mining activities have led to an overall decline in the quantity and quality of carbonate habitat in the San Bernardino Mountains. Carbonate deposits in these mountains contain one of just three important high-purity white calcite deposits in the western United States. As a result, the deposits in the San Bernardino Mountains have been and continue to be extensively mined for commercial use. Most carbonate habitats on National Forest System lands are under mining claims that may become active in the future.

Ongoing mining operations indirectly affect carbonate habitats through dust, changes to surface hydrology, soil erosion, and the resulting increase in non-native plant abundance. Non-native plant species can competitively exclude native plants. Cheat grass, the most widespread weed in the San Bernardino Mountains, has the ability to alter natural fire disturbance regimes by carrying fire into areas that would otherwise not ordinarily burn because of low/sparse fuel loads (U.S. Fish and Wildlife Service 2001).

Approximately 16 miles of National Forest System roads cross or are adjacent to carbonate habitat on the San Bernardino National Forest. Vehicle use off classified roads, mountain bikes, dispersed uses around developed facilities, and special-use permit activities have adversely affected some *Erigeron parishii* habitat.

Occurrence Status

The Carbonate Habitat Management Strategy and associated GIS includes detailed descriptions of

occupied, critical and suitable habitat distribution for this species.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences (refer to the Carbonate Habitat Management Strategy and associated GIS data for more thorough and precise occurrence distribution and mapping).

OCCURRENCE DATA – *Erigeron parishii* (Parish's daisy)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
2	> 300 in 1987; 175 in 1988	1988	ca. 0.25 mi. NW of Cushebury Springs, N of Baldwin Lake. On outwash drainage of Marble Canyon w/ limestone rocks on granitic substrate. w/ <i>Yucca brevifolia</i> , <i>Larrea divericata</i> . Portion of habitat disturbed and sand/gravel operation proposed. Old mill site on property. PVT/BLM.	SBD
3	U	1926	Cactus Flat in Cushenbury Canyon. SBNF.	SBD
4	< 100	1988	1.5 air mi. E of the northernmost point of Baldwin Lake, 0.7 air mi. S of Smarts Ranch Rd. In small drainage on dolomite in narrow band of carbonaceous rock. w/ <i>Pinus monophylla</i> , <i>Yucca brevifolia</i> . Occurrence undisturbed, but ORVs have used adjacent areas heavily. SBNF.	SBD

5	200 in 1979; 100+ in 1987; 300+ in 1988; 4500 in 1991; 50 in new colonies in 1992	1992	S of Top Springs along ridge NE of Smarts Ranch Road, N slope San Bernardino Mtns. Mapped along ridge ca. 0.4 mi S to 0.3 mi. E of Top Spring. On limestone outcrop dominated by [pinyon and juniper]. Also w/ <i>Yucca whipplei</i> , <i>Y. brevifolia</i> , <i>Prunus fasciculatus</i> , <i>Haplopappus linearifolius</i> , <i>Stipa</i> spp., <i>Oryzopsis</i> spp., <i>Opuntia</i> spp. Lower slopes are a target shooting area. Exploratory limestone quarry at W end of occ. Occs. 12, 39, 40 were formerly incl. at this occ. SBNF.	SBD
6	~300 in 1988	1988	Cushenberry Grade; E of Hwy 18, ca. 0.6 mi. SE of Cushenbury Springs. <i>Erigeron</i> plants appear vigorous. On slightly rocky soil w/ cement dust crust. w/ <i>Coleogyne ramosissima</i> , <i>Arctostaphylos glauca</i> . USFS pop. #12-17-2. Probable type locality. Priv.	SBD
7	thousands in 1986, 1988	1988	ca. 1.1 air mi. NE of Cushenbury. N of Monarch Flat. On limestone near quarries assoc. w/ <i>Salazaria mexicana</i> , <i>Coleogyne ramosissima</i> , a few <i>Astragalus albens</i> plants. BLM/PVT.	SBD

8	~1000	1995	NE of Monarch Flat in canyon draining N-slope of Blackhawk Mtn. ca. 1.7 mi. NW of Silver Peak, San Bernardino Mtns. In a rocky drainage on granitic soils w/ limestone rock outwash. w/ <i>Salazaria mexicana</i> , <i>Coleogyne ramosissima</i> . USFS pop. # 12-17-2. <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> var. <i>goodmaniana</i> , <i>Astragalus albens</i> known from vicinity. Jeep trails nearby. BLM.	SBD
9	thousands	1988	Along Cushenbury Canyon btw. Whiskey Springs and Monarch Flat. In drainages and slopes along highway assoc. w/ <i>Pinus monophylla</i> , <i>Juniperus californica</i> , <i>Purshia glandulosa</i> , <i>Astragalus albens</i> , <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Limestone quarry activity has disturbed occ. USFS pop. # 12-17-2. Incl. former occ. 23. SBNF/PVT.	SBD
10	< 2000 in 1988	1988	N of Silver Peak, along W slope of Blackhawk Cyn. On limestone on old slide assoc. w/ <i>Pinus monophylla</i> , <i>Juniperus californica</i> , <i>Yucca brevifolia</i> , <i>Astragalus albens</i> . Limestone and gold mining in area. Plants adj. to roads, but occ. is extensive and relatively undisturbed. USFS pop. # 12-17-3. SBNF.	SBD

11	80 in 1979; > 200 in 1988	1988	Slope E of Horsethief Flat and Arrastre Creek. In sand and gravel rock and drainages w/ <i>Pinus monophylla</i> , <i>Juniperus californica</i> . Area nearby is used by ORVs and campers. USFS pop. # 12-17-4. SBNF.	SBD
12	50 in 1988	1988	ca. 0.5 mi. W of Horsethief Flat, NE of Baldwin Lake. Mapped along 4WD trail leading W from Horsethief Flat. S-facing, moderately steep slope of rocky limestone w/ <i>Pinus monophylla</i> , <i>Juniperus californica</i> , <i>Coleogyne</i> , <i>Yucca schidigera</i> , <i>Cercocarpus ledifolius</i> , <i>Ephedra viridis</i> , <i>Stipa</i> , <i>Arenaria maculata</i> . Potential limestone mining. SBNF.	SBD
13	~2000 in 1988	1992	Terrace Springs vicinity. Along Grapevine Cyn., from Round Mtn. Upstream 1.3 mi. and along ridge S of Terrace Springs. On limestone outcrops and drainages in pinyon-juniper woodland, threatened by past and proposed mining activities USFS pop. # 12-17-3. SBNF.	SBD
20188 (UCR)		1978	Big Bear District near mouth of Grapevine Creek, near mouth just west of Jenkins mine claim, T3N/R2E/S21 (Krantz/UCR)	
20192 (UCR)	U	1979	Grapevine Cyn. Wash & drainage from behind Lester Mine T3N/R2E/S21 (Krantz/UCR)	SBD

14	100 in 1991; 3000 in 1988; 100 along ridge in 1991; 1800 in canyon in 1996	1996	Lower Furnace Canyon, N slope San Bernardino Mtns. In wash on W side of haul road. w/ <i>Pinus monophylla</i> , <i>Juniperus osteosperma</i> , <i>Yucca brevifolia</i> , <i>Y. schidigera</i> , <i>Nolina</i> sp., <i>Astragalus albens</i> . Two colonies: one along canyon and the other on ridge W of canyon and S of mine. Limestone mining has disturbed occ. Presently roads go through the site. USFS pop. # 12-17-1. SBNF/PVT.	SBD
15	> 200 in 1988	1988	Mouth and drainage of Bousic Canyon. On granitic soil w/ limestone overburden. w/ <i>Haplopappus linearifolia</i> , <i>Pinus monophylla</i> , <i>Eriodictyon trichocalyx</i> . Occurrence adjacent to haul road and mine conveyor. USFS pop. #12-17-1. PVT.	SBD
16	> 2000 in 1988; 'hundreds' in 1992	1992	In canyon just to the E of Bousic Canyon. Drainage is undisturbed except where road crosses it. Mostly w/in blackbrush scrub on sandy limestone/granitic soils in drainage and on old road in outwash fan of Bousic Canyon. w/ <i>Astragalus albens</i> , <i>Prunus fasciculatum</i> , <i>Pinus monophylla</i> . Site approved by co. as dump site for mine soils. USFS pop. #12-17-1. PVT.	SBD

17	< 250 in 1988; ~2000 in 1996	1996	Lower Arctic Canyon near outwash fan, N slope San Bernardino Mtns. On rocky drainage slope on granitic/limestone interface. w/ <i>Coleogyne ramosissima</i> , <i>Menodora scoparia</i> , <i>Prunus fasciculatum</i> , <i>Salazaria mexicana</i> , <i>Astragalus albens</i> . Occurrence slightly disturbed by road and trail. USFS pop. #12-17-1. SBNF/PVT.	SBD
19	U	1975	Little San Bernardino Mtns., 8 mi. S of Warren's Wells, E of Long Canyon, Joshua Tree National Park. Growing out of side of steep slope beneath pinyon pine.	RIV
22	175	1988	N of Burns Pinyon Reserve, NW of Yucca Valley, on trail to campground. In cracks of rocks of granitic or quartz monzonite boulders. w/ <i>Haplopappus cuneatus</i> , <i>Pinus monophylla</i> , <i>Juniperus californica</i> . PVT.	SBD
128084 (UCR)	U	2003	UC Burns Pinyon Ridge Reserve, south of Skyline Ranch Rd. ca. 2 miles (air) ESE of Pinoneertown, 1.5 mi. (air) NW of Yucca Valley, student campsite along western fence (Sanders/UCR)	SBD

24	~200	1988	E of Marble Canyon and ca. 1 air mi. SW of Cushenbury, San Bernardino Mtns. On steep rocky limestone slope in a small drainage. w/ <i>Pinus monophylla</i> , <i>Arctostaphylos glauca</i> , <i>Purshia glandulosa</i> , <i>Salvia pachyphylla</i> , <i>Yucca brevifolia</i> , <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Occ. in good shape and undisturbed in 1988. Probably owned by Cushenbury Trust (formerly Kaiser Steel Co.) PVT.	SBD
25	< 150	1988	In small unnamed drainage between Arctic Canyon and Marble Canyon, San Bernardino Mtns. In drainage at base of old overburden dump assoc. w/ <i>Pinus monophylla</i> , <i>Prunus fasciculatum</i> , <i>Eriogonum ovalifolium</i> . PVT owner plans to build road in canyon which could destabilize slopes and cover <i>E. parishii</i> . SBNF/PVT.	SBD
26	U	1988	N side of Nelson Ridge, halfway btw. Smart Spring and Squirrel Spring, San Bernardino Mtns. In a small drainage on mostly dolomite substrate in a narrow band of carbonate rock. w/ <i>Pinus monophylla</i> , <i>Yucca brevifolia</i> , <i>Purshia glandulosa</i> . Occ. undisturbed, but area heavily used by ORVs. SBNF.	SBD

27	> 100 in 2 subpops	1988	ca. 1.75 mi. E of Pioneertown and ca. 0.25 mi. N of Skyline Ranch Rd., NW of Yucca Valley. Granitic soil w/ granitic rocks and boulders. Assoc. w/ <i>Pinus monophylla</i> , <i>Juniperus californica</i> . Occ. in excellent condition, but area is proposed for subdivision into 40-acre parcels. PVT.	SBD
29	U	1988	NE slope of White Mountain, ca. 1 air mi. E of North Peak, San Bernardino Mtns. On limestone w/ <i>Pinus monophylla</i> , <i>Juniperus californica</i> , <i>Eriogonum ovalifolium</i> ssp. <i>vineum</i> , <i>Arctostaphylos glauca</i> . Area has little used roads, but scheduled for quarrying in 1989 and occ. may be destroyed. SBNF.	SBD
30	2000 in 1991	1991	Near Granite Springs, ca. 2.5 air mi. E of Baldwin Lake and 0.8 mi. ESE of Squirrel Spring. Pinyon-juniper woodland dominated by <i>Artemisia tridentata</i> , <i>Chrysothamnus nauseosus</i> . Assoc. w/ <i>Astragalus albens</i> , <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Site is under inactive mining claim and is crossed by an established ORV trail. SBNF.	SBD

31	< 50 in 1992	1992	NE slope of Mineral Mountain, SE of Blue Cut, San Bernardino Mtns. Steep rocky wash draining E in a pinyon-juniper woodland. Along upper reaches of third wash W of Viscera Spring Rd. Assoc. w/ <i>Quercus chrysolepis</i> , <i>Pinus monophylla</i> , <i>Opuntia littoralis</i> var. <i>pierceii</i> , <i>Coleogyne ramosissima</i> , <i>Cordylanthus nevinii</i> , <i>Gilia austrooccidentalis</i> . No present threats, but whole area is under mining claim. Extent of population unknown. Needs fieldwork. SBNF.	SBD
32	10 in 1991	1991	ca. 0.7 mi. W of Furnace Canyon, San Bernardino Mtns. Located in vicinity of old mine. W/in pinyon-juniper woodland on carbonate substrate. Dominated by <i>Pinus monophylla</i> , <i>Juniperus osteosperma</i> . Former Gordon Limestone Quarry. Site of test revegetation project. SBNF.	SBD
33	2 in 1992	1992	Wildrose Canyon, just NW of spring at head of the canyon. Growing along a roadcut on dolomite. <i>Eriogonum ovalifolium</i> var. <i>vineum</i> is growing above the roadcut on an undisturbed hillside. SBNF.	SBD
34	U	1996	E side of Marble Canyon above Marble Canyon Pit. N slope of San Bernardino Mtns. Pinyon-Utah juniper woodland w/ <i>Chrysothamnus viscidiflorus</i> , <i>Arctostaphylos glauca</i> , <i>Prunus fasciculata</i> , <i>Ephedra viridis</i> . Soils derived from carbonate bedrock and alluvium. Potential limestone mining. SBNF.	SBD

35	500 in 1995	1995	NE slope of Blackhawk Mtn. ca. 0.5 mi. E of Blackhawk Canyon, N slope San Bernardino Mtns. Mapped in drainage E of Blackhawk Canyon from ca. 4500-5000 ft. Creosote bush scrub in alluvial wash. Soil derived mostly from carbonate. w/ <i>Larrea tridentata</i> , <i>Lepidospartum squamatum</i> , <i>Salvia mohavensis</i> , <i>Artemisia tridentata</i> , <i>Achnatherum speciosum</i> , <i>Adenophyllum cooperi</i> . Nearby gold mining, but site currently appears safe. SBNF.	SBD
36	50 in 1995	1995	N of Blackhawk Mtn. ca. 0.6 mi. NNW of mouth of Blackhawk Canyon, N slope of San Bernardino Mtns. Creosote bush scrub in alluvial wash. Soil derived mostly from carbonate. Assoc. w/ <i>Larrea tridentata</i> , <i>Encelia virginensis</i> , <i>Coleogyne ramosissima</i> , <i>Yucca schidigera</i> , <i>Achnatherum speciosum</i> , <i>Pleuraphis rigida</i> , <i>Eriogonum inflatum</i> . In bottom of wash on E side of Santa Fe Mine Road. Growing w/ <i>Astragalus albens</i> . Nearby mining activity, but site is currently not threatened. SBNF.	SBD
37	20 in 1995	1995	NNW of Blackhawk Mountain, ca. 1.75 mi. ENE of Hwy 18 at Camp Rock Road, N outwash of San Bernardino Mtns. Mapped along wash just W of Hill 3919'. Creosote bush scrub in alluvial wash. Soil derived mostly from carbonate. w/ <i>Larrea tridentata</i> , <i>Achnatherum speciosum</i> , <i>Petalonyx nitidus</i> , <i>Lycium andersonii</i> , <i>Galium angustifolium</i> , <i>Echinocereus engelmannii</i> . Nearby mining activity, but site is not currently	SBD

			threatened. SBNF.	
38	U	1995	NW of Blackhawk Mountain ca. 0.6 mi. NE of Hwy 18 at Camp Rock Road, N outwash of San Bernardino Mtns. In wash ca. 0.25 mi. N of Hill w/ 3919' benchmark. Creosote bush scrub in alluvial wash. Soil derived mostly from carbonate. Assoc. w/ <i>Larrea tridentata</i> , <i>Achnatherum speciosum</i> , <i>Ambrosia dumosa</i> , <i>Hymenoclea salsola</i> , <i>Adenophyllum cooperi</i> , <i>Camissonia boothii desertorum</i> , <i>Orobanche</i> . Nearby mining activity, but site is currently not threatened. SBNF.	SBD
39	< 10 in 1992	1992	E of Smarts Ranch Road on ridge above Lone Valley, ca. 1 mi. SE of Top Spring, San Bernardino Mtns. Site is ca. 100 m SE of 6138' benchmark on ridgetop. Pinyon-juniper woodland on carbonate soils w/ <i>Pinus monophylla</i> , <i>Juniperus osteosperma</i> , <i>Yucca brevifolia</i> , <i>Y. schidigera</i> , <i>Stipa coronata</i> , <i>Opuntia basilaris</i> , <i>Arenaria macradenia</i> . <i>Astragalus albens</i> , <i>Eriogonum ovalifolium</i> ssp. <i>vineum</i> , <i>Arabis shockleyi</i> also in area. SBNF.	SBD

40	< 10 in E colony in 1992; 400 in 2 W colonies in 1995	1995	S end of Lone Valley near Squirrel Spring and Smarts Ranch Road, 1-1.5 mi. E of Canyon Spring, San Bernardino Mtns. Pinyon-juniper woodland on carbonate soils w/ <i>Pinus monophylla</i> , <i>Atriplex canescens</i> , <i>Fremontodendron californicum</i> , <i>Opuntia echinocarpa</i> , <i>Chrysothamnus viscidiflorus</i> , <i>Achnatherum coronatum</i> . Three colonies; two on SW side of Lone Valley ca. 250 m and 400 m NW of Squirrel Spring and one along N side of road at SE end of valley. Many ORV trails in area, but none threaten site. Woodcutting and mining may threaten. SBNF.	SBD
41	200	2000	SOUTHEAST OF RATTLESNAKE CANYON, APPROXIMATELY 1.3 AIRMILE NNE OF MOUND SPRING. ONE SMALL COLONY LOCATED PRIMARILY IN THE NE 1/4 OF THE NE 1/4 OF SECTION 14. BLM	SBD
618078 (RSA)	U	1998	San Bernardino Mountains: Above Smarts Ranch Road, east of Johnston Grade on Hwy 18, near small quarry. Near 34 ° 18'14.4" N 116 ° 47'58" W. T3 N R2 E N 1/2 sec. 32. (Soza)	SBD
616167 (RSA)	U	1998	San Bernardino Mountains: Eastern side of Nelson Ridge, west of Smarts Ranch Road, north of 3N03B. Near 34 ° 17'14" N 116 ° 46'39" W. T2 N R2 E center of sec. 4. Elev. 6100 Feet. (Soza)	SBD

616177 (RSA)	U	1998	San Bernardino Mountains: East of Marble Canyon, south of Mitsubishi Cement haul road. Near 34 ° 20'44" N 116 ° 52'08" W. T3 N R1 E NW 1/4 sec. 15. Elev. 5450 Feet. (Soza)	SBD
357534 (RSA)	U	1978	San Bernardino Mts. Hwy 18 ca. 7.8 miles SE of Lucerne Valley up Cushenbury Grade. 4100 ft. (Davidson)	SBD
357536 (RSA)	U	1978	San Bernardino Mts. Hwy 18, 8.7 mi SE of Lucerne Valley, 0.1 mi inside San Bernardino Nat. Forest. 4500 ft. elev. NE side of the road. Pinyon -juniper woodland. Limestone talus up a small draw on NE side of the road. (Davidson)	SBD
357535 (RSA)	U	1979	St. Highway 18 up Cushenbury Canyon, ca. 1/4 mi inside San Bernardino Nat'l Forest boundry; elev. 4650-4800 ft (Gustafson)	SBD
357533 (RSA)	U	1922	Cushenbury Ranch, the type station (Jaeger)	SBD
248188 (RSA)	U	1939	Little San Bernardino Mts.: 8 miles S of Warrens Well. Alt. 4200 ft. (Jaeger)	SBD
248190 (RSA)	U	1939	Joshua Tree National Monument.: 6 miles S of Lone Star Service Station. alt. 4000 ft. (Jones)	SBD
145339 (RSA)	U	1927	Cushenberry Springs. Mojave Desert (Munz)	SBD

511326 (RSA)	U	1988	Mojave Desert, ~2 miles E of Pioneertown. (T1N, R5E, SW/4 sec 21) Elev. 3900-4100 ft. (Pendleton)	SBD
502389 (RSA)	U	1989	Cushenbury Canyon, 0.3 miles below Whiskey Springs, SW1/4 sec. 13 T3N R1E, 5200 ft. elev. (Taylor)	SBD
601096 (RSA)	U	1996	Above Lucerne Valley: Specialty Minerals Inc. newly approved Arctic Cyn. quarry site; private land N of National Forest boundry. USGS Fawnskin 7.5' quad. 5200 ft. elev. (1585m), ±100 ft. Arctic Cyn. 34°21'N, 116°53'W (White)	SBD
479891 (RSA)	U	1988	San Bernadino Mts. above Silver Creek, White Ridge; above Lucerne Valley. (Wisura)	SBD
20196 (UCR)	U	1979	E from Hwy 18 on 3N03. Two small quarries in vicinity, T3N/R2E/S32 (Krantz/UCR)	SBD
30563 (UCR)	U	1947	San Bernardino Bottom of the Cyn. Above Cushenbury Springs, T3N/R1E/S14 (Roos/UCR)	SBD
20193 (UCR)	U	1979	Cushenbury Cyn. Just below Whiskey Spring on old, seldom used access road to quarry E of Hwy T3N/R1E/S24 (Krantz/UCR)	SBD
20194 (UCR)	U	1978	Cushenbury Cyn. E of Hwy 18, just N of Whiskey Springs. On dirt road to abandoned limestone quarry T3N/R1E/S24 (Krantz/UCR)	SBD

20197 (UCR)	U	1979	Furnace Canyon, disturbed limestone wash below the Pfizer quarry T3N/R1E/S7 (Krantz/UCR)	SBD
72356 (UCR)	U	1992	S of Lucerne Valley on alluvial slope below Pfizer limestone quarry in Marble Canyon (first large canyon W of Cushenbury Canyon & Hwy 18), T3N/R1E/S10 (White/UCR)	SBD
52589 (UCR)	U	1988	Wessman property N of Cushenbury Springs T3N/R1E/S10 (LaPre/UCR)	SBD
94038 (UCR)	U	1996	Desert-facing slope, above Lucerne Valley: Specialty Minerals Inc. newly approved Arctic Canyon quarry site; private land N of National Forest boundary.	SBD
92502 (UCR)	U	1994	Marble Canyon, above Specialty Minerals Inc. quarry, N side of mtns., T3N/R1E/S15 & 16 (Patten/UCR)	SBD

- *U* = Unknown
- * = an occurrence number has not been assigned
- *SBNF* = San Bernardino National Forest
- *SBD* = San Bernardino County
- *PVT* = Private Property

Threats

On National Forest System lands, *Erigeron parishii* is threatened by mining activities, mineral exploration, road and power line construction, utility corridors, vehicle use off classified roads, and grazing outside of designated areas. While the majority of this species' habitat is under mining claim, implementation of the Carbonate Habitat Management Strategy will provide habitat reserves protected from mining sufficient to provide for long-term viability.

Threats on private land include mining activities and a proposed housing development near Pioneertown (California Natural Diversity Database 2004).

The long-term protection of this species has been ensured through the Carbonate Habitat Management Strategy (CHMS), which was completed in 2003 and developed collaboratively by a diverse group of affected parties. Implementation of this strategy will provide for the recovery of four threatened and endangered carbonate endemic plant species while also providing for continued economically important limestone mining. The CHMS defines a set of land management categories ranging from expected and current mining to Carbonate Habitat Reserves that will be managed for the conservation of the listed plants and habitat. Collaborating parties signed a Memorandum of Understanding (MOU), committing the SBNF to administer the strategy as future mining projects proceed and the habitat reserve is assembled (USDA Forest Service 2003).

Conservation and Management Considerations

The primary conservation strategy for *Erigeron parishii* is to implement the Carbonate Habitat Management Strategy and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Implement the Carbonate Habitat Management Strategy.
- Utilize the habitat suitability criteria and detection protocol developed for this taxon and apply to surveys at the project level. This will help to ensure that future projects and management actions with effects to this taxon will trigger the appropriate standards, even where occurrences are currently not known.
- Survey all new occurrences of *Erigeron parishii* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Erigeron parishii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Erigeron parishii* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas and the CHMS Habitat Inventory.

Evaluation of Current Situation and Risks on National Forest System Lands

Erigeron parishii is a locally common narrow endemic species known only to occur in the northeastern San Bernardino Mountains, almost entirely on carbonate soils. Some of these carbonate habitat areas are protected from identified threats, although most others are not well protected.

Based on the above analysis, *Erigeron parishii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	B	C	B

Erigeron parishii is listed under the federal Endangered Species Act as threatened, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

The viability of this species is tied tightly to protection and management of carbonate habitat. Existing protections afforded this species and its critical habitat under the Endangered Species Act provides considerable baseline protection. With full implementation of the CHMS, viability for this species on NFS lands is secure.

The CHMS will provide protection and management with regard to mining activities under all alternatives, but with greater effectiveness under Alternatives 2 through 6. Under the CHMS, mining will continue to result in the majority of impacts to this species and its habitat. As an important core habitat reserve under the CHMS, the Blackhawk RNA is essential for a favorable viability outcome.

Under Alternatives 1, 4 and 5, protections for this species related to Land Use Zones would be mainly limited to the existing Bighorn Mountains Wilderness. Under Alternatives 2, 4, and 6, Back Country Non-Motorized (BCNM) zoning in the Heartbreak Ridge area would provide some additional protection, and under Alternative 3 and 4a, the recommended wilderness area at Heartbreak Ridge would provide increased protection for a relatively small portion of this species habitat. Under Alternatives 2, 3, 4a and 6, designation of the proposed Blackhawk RNA would provide essential protection, and would become a core habitat reserve under the CHMS. Under Alternatives 3, 4a and 6, additional areas of designated Back Country Non-Motorized zoning would provide a modest increase in protection for this species. The Alternatives would provide varying protection from unauthorized off-road driving, however, because of habitat terrain, this is not expected to be a substantial impact for this species.

Consideration of the standards regarding roads and recreation factor into these outcomes. The proposed Blackhawk RNA, where applied, is critical to these outcomes. Presumed implementation of the CHMS is fundamental to the outcomes.

Viability Outcomes for All lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	B	C	B

The private lands, mainly patented claims along the base of the north slope of the San Bernardino Mountains, are a major portion of this species' distribution and have been reduced by large-scale limestone mining. The habitat surrounding these mines continues to be lost as quarries are expanded. This loss on non-federal lands is expected to be guided in the future by the CHMS and thus not expected to reduce the viability of the protected and managed occurrences on the SBNF. Habitat on BLM lands to the north of the SBNF will also be managed under the CHMS, so that all of this species' habitat will be managed under a single strategy across jurisdictional boundaries. At the far eastern extent of this species distribution, one historic occurrence is protected at Joshua Tree National Park, a significant occurrence is protected on State Land at the University of California Burns Canyon Natural Reserve, and two nearby occurrences on Private Land in Pioneer town are likely to be lost to residential development.

By maintaining the current distribution of *Erigeron parishii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Erigeron parishii* to suffer a decline in its overall distribution.

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Erigeron breweri var. jacinteus

Erigeron uncialis var. uncialis

Erigeron uncialis var. uncialis

Erigeron uncialis Blake var. *uncialis* (Limestone daisy)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G?T3?, S1 (California Natural Diversity Database)

California Native Plant Society - List 2; R-E-D Code 3-2-1 (California Native Plant Society 2001).

General Distribution

Erigeron uncialis var. *uncialis* occurs in Inyo County. Its range extends to central Nevada. Populations are known from the Grapevine, Clark, the White, and Inyo mountain ranges. Disjunct occurrences are located in the Schell Creek and White Pine mountains of Nevada (USDA Forest Service 2003).

Distribution in the Planning Area

The California Natural Diversity Database (2004) reports one occurrence in Cushenbury Canyon in San Bernardino County; however, this occurrence was recently determined to have been a misidentification. The specimen collected was *Erigeron parishii*. It is unlikely that *Erigeron uncialis* var. *uncialis* occurs on the San Bernardino National Forest, but there is some potential habitat for this species (USDA Forest Service 2003).

Taxonomy and Natural History

Erigeron uncialis var. *uncialis* is a dicotyledon in the sunflower family (Asteraceae). This perennial herb blooms from June-July (California Native Plant Society 2001). One other subspecies, *E. uncialis* var. *conjugans*, is recognized at this time; it is endemic to southern Nevada (Nesom 1993). The previously recognized *E. cavernensis* has been subsumed within *Erigeron uncialis* var. *uncialis* by recent taxonomic work (Cronquist 1994).

Erigeron uncialis var. *uncialis* is a 1-4 cm perennial from a taproot and slender-branched caudex. The

plant is simple and spreading-hairy. The leaves are basal, 5-25 mm, long-petioled, and widely elliptic to obovate. The inflorescence consists of one head that is 6-11 mm in diameter. The phyllaries are more or less equal and densely sessile-glandular. There are 15-40 ray flowers. The corollas are 4-6 mm, and the ligules are white to pinkish, not coiled or reflexed. There are 13-22 pappus bristles (Nesom 1993).

Habitat Description

Erigeron uncialis var. *uncialis* occurs on carbonate soils and in crevices of limestone cliffs in Great Basin sage scrub, desert montane, and subalpine coniferous forest habitats at elevations of 6,825-9,425 ft (2,100-2,900 m) (Nesom 1993; California Native Plant Society 2001, California Natural Diversity Database 2002).

Within the area, carbonate habitats occupy an estimated 20,893 acres, of which 87% (18,177 acres) is situated on public lands. Carbonate- and limestone-derived outcrops and soils are found in several east-west trending bands over approximately 20 miles (32 kilometers) of the northern desert-facing slopes in the San Bernardino Mountains. Carbonate habitats have are highly sensitive to ground disturbance and vegetation removal. Once disturbed, carbonate vegetation is slow to recover due to low plant productivity, thin, impoverished soils, and dry climate in this part of the San Bernardino Mountains. Mining activities, such as the soil removal, road development, and dumping of overburden rock have led to an overall decline in the quantity and quality of carbonate habitat (USDA Forest Service 2003).

Occurrence Status

Erigeron uncialis var. *uncialis* is considered to be in danger of extinction in a portion of its range, but it is more widespread outside of California (California Native Plant Society 2001). There are only five reported occurrences of *Erigeron uncialis* var. *uncialis* in California: three in San Bernardino County and two in Inyo County. One population on Tin Mountain in the Cottonwood Mountains has not been relocated during recent surveys. All recorded populations contain fewer than 50 plants (California Natural Diversity Database 2002).

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Erigeron uncialis* var. *uncialis* (Limestone daisy)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1	U	1980	Lower Cushenbury Canyon, San Bernardino Mountains. THIS OCCURRENCE HAS BEEN DETERMINED TO BE A MISIDENTIFICATION.	SBD
2	10 in 1989, < 50 in 1978	1989	East slope of Clark Mountain, ca. 1.2 mi. ENE of summit, Clark Mountain Range. Site referred to as Forsellesia Canyon. Cracks and crevices of limestone cliff w/in white fir-pinyon pine zone. w/ <i>Petrophytum caespitosum</i> , <i>Cercocarpus intricatus</i> , <i>Ivesia jaegeri</i> , <i>Phacelia perityloides</i> . BLM.	SBD
3	< 50	1976	N side of Clark Mountain summit, Clark Mountain Range, eastern Mojave Desert. Site referred to as 'cliff at head of fir canyon.' Growing in cracks of limestone cliffs w/in pinyon pine-white fir forest. BLM.	SBD
4	U	1939	Tin Mountain, Cottonwood Mountains. No plants observed in a recent survey by P. Peterson. Land owner: U.	Inyo
5	U	1954	Mazourka Canyon near the SE end of Badger Flat, Inyo Mountains. Dry crevices of N-facing limestone/shale cliff. Growing w/ <i>Chamaebatiaria millefolium</i> , <i>Eriogonum heermannii argense</i> . Land owner: U.	Inyo

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBR = San Bernardino County*

Threats

There are no known occurrences of *Erigeron uncialis* var. *uncialis* within the planning area, and the

probability of its occurrence here is low. Therefore, it is not expected that Forest uses within the plan area are impacting this species. Habitat in Nevada (carbonate rock and crevices) is relatively widespread and is not considered vulnerable at this time (USDA Forest Service 2003).

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Erigeron uncialis* var. *uncialis*:

- Survey all new occurrences of *Erigeron uncialis* var. *uncialis* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Erigeron uncialis* var. *uncialis* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- If occurrences are found in the southern California national forests, map using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threat on National Forest System Lands

This taxon was a threat category 2 in the Forest Plan Revision Draft Environmental Impact Statement. Additional review of this taxon for the Final Environmental Impact Statement has concluded the occurrence thought to be *Erigeron uncialis* var. *uncialis* was misidentified (Eliason pers. comm.). Based upon the above analysis this species has been reassigned the following threat category:

1. Not in the Plan area.

Viability Outcomes

Erigeron uncialis var. *uncialis* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

No populations of *Erigeron uncialis* var. *uncialis* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Therefore, no such analysis is presented for *Erigeron uncialis* var. *uncialis*.

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Personal communication

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Erigeron parishii

Eriogonum butterworthianum

Eriogonum butterworthianum

Eriogonum butterworthianum J.T. Howell (Butterworth's buckwheat)

Management Status

Federal: Forest Service Sensitive

California: Rare

Heritage Rank: G1 S1.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Eriogonum butterworthianum is known from the vicinity of Arroyo Seco in the northern Santa Lucia Range of Monterey County (California Natural Diversity Database 2004).

Distribution in the Planning Area

Eriogonum butterworthianum is known from 10 patches distributed close together in about a one-square-mile area near Arroyo Seco Road and Santa Lucia Memorial Park, on the Monterey Ranger District, Los Padres National Forest (California Natural Diversity Database 2004, CalFlora 2002, maps on file with Los Padres National Forest).

There are no occurrences of *Eriogonum butterworthianum* on private land. Surveys for this taxon with Neese on nearby areas of Fort Hunter Liggett were unsuccessful (Painter 2004).

Taxonomy and Natural History

Eriogonum butterworthianum is a dicot in the buckwheat family (Polygonaceae).

Eriogonum butterworthianum is a semi-woody perennial or shrub that blooms June-July (Hickman 1993, California Native Plant Society 2001).

Habitat Description

Eriogonum butterworthianum grows in full sun on and in crevices in Vaqueros sandstone outcrops, in chaparral habitats at elevations of 1,900–2,400 feet (580–730 meters) (California Natural Diversity Database 2004, Matthews 1997). Woolly Indian paintbrush (*Castilleja foliolosa*) and bush monkeyflower (*Mimulus aurantiacus*) are common associates (Stephenson and Calcarone 1999).

Occurrence Status

Eriogonum butterworthianum is distributed in several highly restricted occurrences, but is not currently considered to be at risk of extinction (California Native Plant Society 2001). Population trends appear to be stable on the Los Padres National Forest (Foster 1998). Abundance estimates for each occurrence range from 50 to fewer than 1,000 individual plants (California Natural Diversity Database 2004).

Threats

Eriogonum butterworthianum has low vulnerability on National Forest System lands (Stephenson and Calcarone 1999). The primary threat to the species on the Los Padres National Forest is foot traffic from cross-country hikers (Foster 1998).

Conservation and Management Considerations

Monitor populations of *Eriogonum butterworthianum* near trails and other areas with high visitor activity and, if these populations appear to be in decline, implement measures such as signage, visitor education, or restrictions to visitor access to reduce impacts.

Evaluation of Current Situation and Threat on National Forest System Lands

Eriogonum butterworthianum is a very narrow endemic restricted to a series of Vaqueros sandstone outcrops in the eastern portion of the Monterey Ranger District. Within this narrow range, most plants occur in habitat not vulnerable to human impacts except from occasional cross country hikers who may step upon and damage plants.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Eriogonum butterworthianum is a USDA Region 5 Forest Service Sensitive species. This assures that

any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Eriogonum butterworthianum* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Eriogonum butterworthianum* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Erigeron uncialis var. uncialis

Eriogonum evandium

Eriogonum evandium

Eriogonum evanidum Reveal (Vanishing wild buckwheat)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; SH (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-2

General Distribution

Eriogonum evanidum was historically collected in Riverside, San Bernardino, and San Diego counties, but this species may now be extinct (Reveal 2005). The historic distribution included Pine Valley and Warner Springs in San Diego County, Garner Valley in the San Jacinto Mountains in Riverside County, and Big Bear Valley in the San Bernardino Mountains, and south to Baja California. More recent collections are in question.

Distribution in the Planning Area

Although there are several old records for *Eriogonum evanidum* from Big Bear Valley in the San Bernardino Mountains, it is unclear whether any of these localities are within the San Bernardino National Forest (SBNF). It is also unknown whether the locality in Garner Valley in the San Jacinto Mountains (CNDDDB occ.no. 3) is within the SBNF. Suitable habitat is extant on the San Bernardino and Cleveland National Forests near historic localities and warrants surveys to challenge the possible extinct status.

Taxonomy and Natural History

Eriogonum evanidum is a newly-described annual herb in the buckwheat family (*Polygonaceae*) formerly included in the closely related *Eriogonum foliosum* (Reveal 2005). *Eriogonum foliosum* as currently described does not occur north of the US-Mexican border.

The plant is generally 1-2 dm high. Stems are erect and tomentose to floccose. Leaves are basal, with the petioles 5-15 mm long, and blade oblong to round, +/- 1cm, and tomentose to floccose. The inflorescence is narrowly cymose, tomentose to floccose. The perianth is more or less 1 mm long, yellowish-white, and glabrous. Flowering occurs July through October. (Reveal 2005)

Habitat Description

Eriogonum evanidum occurs in sandy or gravelly flats and slopes in sagebrush, oak woodland, and montane conifer woodlands. It grows between 1100 and 2100 m elevation (requiring confirmation for lower records at Lytle Creek and Verdugo Hills). Suitable habitat for this plant exists on the CNF and is widely distributed on the SBNF.

Occurrence Status

There are no records of extant occurrences that are not in question. There are four records for *Eriogonum evanidum* in the CNDDDB (2004) and several other known occurrences that have not yet been entered in the CNDDDB. There are several old records from San Diego, Riverside, and San Bernardino counties. There is one new record from San Diego County needing confirmation. The status of *Eriogonum evanidum*, if extant, is not at all understood.

The following table shows the recorded occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Eriogonum evanidum* (Vanishing wild buckwheat)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1989 (lit.)	Pine Valley. U	SD
2	U	1989 (lit.)	Near Warners Hot Spring. U	SD
3 35098 (UCR)	U	1967	Hemet [Garner] Valley, near Thomas Mt. Valley subdivision, 4600 ft., dry valley floor, yellow pine forest, San Jacinto Mts. (Ziegler/RSA)	RIV

4	U	U	Exact location unknown, specified in text as "1/4 mile from Alpine Creek Road in San Diego County". Mapped in vicinity of Alpine Creek Circle and Alpine Creek Lane in the community of Alpine.	SD
*	U	U	Unknown location (Calflora 2002). U	RIV
*	U	1902	[Big] Bear V. (Krantz, et. al. draft 2000)	SBD
*	U	U	Between Big Bear and Baldwin Lakes, 2000 m. (Krantz, et. al. 2000)	SBD
*	U	U	Bear Valley, near old mill, 7000 ft (Krantz, et. al. 2000)	SBD
65979 (RSA)	U	1927, 1929	Baldwin Lake, SW slopes of Baldwin Lake. San Bernardino Mountains. U. (Peirson)	SBD
193462 (RSA)	U	1929	Along stream south of Peter Pan Woodland Club, Bear Valley. 6800'. U.	SBD
393367 (RSA)	U	1931	Between Big Bear and Baldwin Lake, San Bernardino Mountains. 2000 m. U. (Templeton)	SBD
1819359 (Calflora)	U	1971	w side of Lytle Crk , between Riverside Ave. and Sierra Ave., about 0.25 mi s of their junction, nw of San Bernardino; Santa Ana River drainage area; San Gabriel Mt range. Needs confirmation. U	SBD

*	U	1931	Lundy's Landing San Bernardino Mts., Big Bear Lake (Calflora 2002). U	SBD
888136 (Calflora 2002)	U	1875	California: San Diego: Tantillas [Cantillas] Mountains. U	SD
*	U	1994	Pine Valley, Peninsular Range. Collected September, 1994. (Hirshberg/RSA) CNF. Needs confirmation.	SD
*	U	1930	Pine Valley, Peninsular Range, elev. 3800 Ft. collected October 25 (Fosberg/RSA)	SD
*	U	1902	Bear Valley, San Bernardino Mts. Collected August 5. (Abrams/UC/Jeps)	SBD
*	U	1927	Flat above Big Bear Lake, collected September 29. (Hoffman/UC/Jeps)	SBD
*	U	1931	Verdugo Mts., Tuna Canyon. Elev. 1100 ft. Collected April 10. Needs confirmation. (McFadden/RSA)	LA

- *U = Unknown*
- ** = an occurrence number has not been assigned (USDA Forest Service 2002)*
- *SD = San Diego County*
- *CNF = Cleveland National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*
- *RIV = Riverside County*

Threats

If occurrences of *Eriogonum evanidum* have persisted on Forest System lands, the plant faces potential threats from a variety of Forest uses, primarily from dispersed recreation (vehicle use off designated roads, hiking, equestrian use, *etc.*). Threats to suitable habitat on the SBNF include a variety

of forest uses, including most dispersed recreation uses. If plants have persisted in montane conifer habitat, habitat may be affected by an altered fire regime due to fire suppression. Other vegetation types where this plant may occur may be affected by too frequent fire and nonnative plant establishment. Loss of populations from stochastic events is also a possibility.

Conservation and Management Considerations

The primary short-term conservation strategy for this species is try and locate extant occurrences so that they may be managed for conservation. The following is a prioritized list of conservation practices that should be considered for *Eriogonum evanidum*:

- Survey historic occurrences and any newly discovered occurrences of *Eriogonum evanidum*; record occurrence status, habitat condition, and threats.
- If locations are found, collect a herbarium voucher specimen of *Eriogonum evanidum* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Eriogonum evanidum* in the southern California National Forests using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Eriogonum evanidum is an uncommon, widely-distributed species, known within the Province from widely scattered occurrences in San Bernardino Mountains, San Jacinto and Cuyamaca Mountains. Few of these occurrences have been recorded recently, and those that have are in taxonomic doubt, so threats to this species are not currently known.

Based on what is known about this species distribution and habitat associations, and considering the threat inherent in poor knowledge, *Eriogonum evanidum* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
E	E	E	E	E	E	E

Eriogonum evanidum is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Eriogonum evanidum* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Because the distribution of this species, if extant, is not at all understood, it is not possible to compare the protections and vulnerabilities of this species as a function of land use zoning across the alternatives. No populations are known on NFS lands at this time. If populations are present, they may be small in size and not naturally well distributed. There is potential for extirpation from NFS lands due to stochastic events that are unrelated to uses and activities on NFS lands.

Viability Outcomes for All Lands Within the Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

The private lands of Big Bear Valley, Warner Springs, and Pine Valley have been highly reduced and fragmented by residential and commercial development. Garner Valley has been moderately impacted by residential (ranchette) development and by grazing. All of these impacts are ongoing and expected to continue.

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Eriogonum butterworthianum

**Eriogonum kennedyi var.
alpigenum**

Eriogonum kennedyi var. alpigenum

Eriogonum kennedyi Wats. var. *alpigenum* Munz & I. M. Johnston (Southern alpine buckwheat)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4T2 S2.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Eriogonum kennedyi var. *alpigenum* occurs in Los Angeles, San Bernardino, and Ventura Counties in the San Gabriel and San Bernardino Mountains and on Mount Pinos in the western Transverse Range (Hickman 1993).

Distribution in the Planning Area

The California Natural Diversity Database (2004) lists five occurrences of *Eriogonum kennedyi* var. *alpigenum*, four of which are known only from collections made 30 or more years ago; all occurrences are on National Forest System lands (California Natural Diversity Database 2004). Populations are reported at Burnt Flats and San Gorgonio Mountain on the San Bernardino National Forest and the Crystal Lake area on the Angeles National Forest (Lardner et al. 1998). The Burnt Flats occurrence may be an erroneous report, based on a misidentification of southern mountain buckwheat (*E. k.* var. *austromontanum*). Southern alpine buckwheat is also locally common on the summit of Mount Pinos on the Los Padres National Forest in Ventura County.

Taxonomy and Natural History

Eriogonum kennedyi var. *alpigenum* is a dicot in the buckwheat family (Polygonaceae). Five subspecies of *Eriogonum kennedyi* are recognized; two other subspecies are on California Native Plant Society's List 1B, including southern mountain buckwheat, which is federally listed as

threatened. *Eriogonum kennedyi* var. *alpigenum* is distinguished from the other subspecies by leaf shape and the length of the inflorescence axis (Hickman 1993). On Mount Pinos, *Eriogonum kennedyi* var. *alpigenum* is found growing with *Eriogonum kennedyi* var. *kennedyi* and *Eriogonum wrightii* var. *subscaposum*.

Eriogonum kennedyi var. *alpigenum* is a small, mat-forming perennial, 5-15 cm tall, and 10-50 cm in diameter. The leaves are oblanceolate to elliptic with rounded tips. The inflorescence is head-like and sits atop an axis, which is generally 1-2 cm. The involucre is 1-2 mm. The perianth is white to rose, 1.5-2.5 mm, and normally blooms between July and September (California Native Plant Society 2001).

Habitat Description

Eriogonum kennedyi var. *alpigenum* grows on dry granitic gravel in alpine boulder and rock fields and subalpine coniferous forest at elevations of 8,500–11,500 feet (2,600–3,500 meters) (California Native Plant Society 2001).

Occurrence Status

Eriogonum kennedyi var. *alpigenum* is distributed in a limited number of occurrences, but is considered not to be at risk of extinction (California Native Plant Society 2001). At the type locality on San Gorgonio Mountain, the plant was reported to be common and widespread, containing more than 10,000 plants in 1994 (California Natural Diversity Database 2004). Population trends on National Forest System lands are otherwise poorly known (Stephenson and Calcarone 1999).

Threats

Eriogonum kennedyi var. *alpigenum* is considered to have low vulnerability on National Forest System lands (Stephenson and Calcarone 1999). However, it may be at risk from trampling by off-trail hikers and from collectors for use in floral arrangements (Lardner et al. 1998, California Natural Diversity Database 2004). Another potential threat to this species is collection by nursery trade, as *Eriogonum kennedyi* var. *alpigenum* is increasingly popular with alpine and rock garden plant collectors/enthusiasts. A dirt road that bisects the population on top of Mount Pinos has been closed to the public for motorized access and is now used primarily as a foot trail. The road receives occasional use by the US Air Force when maintaining a communication site and by Native American elders accessing ceremonial sites atop the mountain. This restriction of use has benefited *Eriogonum kennedyi* var. *alpigenum* by reducing impacts from parked vehicles and by reducing the overall amount of trampling that occurs from human foot traffic. One unmitigated impact that sometimes occurs is trampling from off-trail mountain bike use. The magnitude of this impact is currently small but could increase as the sport of mountain biking increases in popularity. The occurrence found atop Mount Pinos is located within the Mount Pinos Botanical Special Interest Area (SIA) and this designation provides substantial protection for the plants located within the SIA.

Conservation and Management Considerations

Do not authorize collection of *Eriogonum kennedyi* var. *alpigenum* for use in floral arrangements. Monitor plants and habitat for impacts resulting from unauthorized collection and from unauthorized off trail travel by mountain bikes. Develop mitigation measures if impacts are found to be sufficient to cause a decline in the abundance of *Eriogonum kennedyi* var. *alpigenum*.

Evaluation of Current Situation and Threats on National Forest System Lands

Eriogonum kennedyi var. *alpigenum* has a disjunct distribution, with populations found atop the highest peaks of the western Transverse Range, and San Gabriel Mountains, and the San Bernardino Mountains. These mountaintop occurrences are generally fairly large in extent and the numbers of individuals is also large. Although there are some potential threats that need to be monitored to allow for the early detection of downward trends in species abundance or distribution, current information indicates that *Eriogonum kennedyi* var. *alpigenum* populations are stable and not likely to decline in the foreseeable future.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Eriogonum kennedyi var. *alpigenum* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Eriogonum kennedyi* var. *alpigenum* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Eriogonum kennedyi* var. *alpigenum* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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CalFlora: [web application]. 2002. Information on California plants for education, research and

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California Natural Diversity Database. Special Vascular Plants, Bryophytes, and Lichens List. Sacramento, CA: California Department of Fish and Game.

Eriogonum evandium

**Eriogonum kennedyi var.
austromontanum**

Eriogonum kennedyi var. **austromontanum**

Eriogonum kennedyi S. Watson var. *austromontanum* Munz & I.M. Johnston (Southern mountain buckwheat)

Management Status

Federal: Threatened

California: None

Heritage Rank: G4T2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

There is no Critical Habitat designated or proposed for this species.

General Distribution

Eriogonum kennedyi var. *austromontanum* is endemic to pebble plain habitat in and around Big Bear and Holcomb Valleys in the San Bernardino Mountains in San Bernardino County. The California Natural Diversity Database (2004) contains records for 20 occurrences.

Distribution in the Planning Area

Eriogonum kennedyi var. *austromontanum* is known from within approximately 910 acres (368 hectares) of pebble plain habitat in Big Bear and Holcomb valleys on the San Bernardino National Forest. Roughly, fifteen of the 20 occurrences are on or partially on the San Bernardino National Forest. Some occupied habitat in adjacent areas occurs on private lands, and State lands managed by the California Department of Fish and Game (USDA Forest Service 2000; California Natural Diversity Database 2004).

The California Natural Diversity Database (California Natural Diversity Database 2004) contains records for occurrences within in pebble plains in the following areas: Big Bear Lake, Gold Mountain, Holcomb Valley, North Baldwin Lake, Fawnskin, South Baldwin Ridge (incl. Erwin Lake), Arrastre Flats, and Broom Flat Sawmill.

Taxonomy and Natural History

Eriogonum kennedyi var. *austromontanum* is a perennial in the buckwheat family (Polygonaceae) that flowers July-September (California Native Plant Society 2001). Pollination and genetic studies completed on this taxon found that seed dispersal was limited to about 5 meters from a pebble plain edge (Freas 1988); however, seed movement by animals was not addressed in this study. There are five varieties of *Eriogonum kennedyi*, three of which occur in the San Bernardino Mountains. *Eriogonum kennedyi* var. *austromontanum* is separated from other varieties by its leaf size and shape and by the size and characteristics of its inflorescence and involucre (Hickman 1993), however in practice identification can be very difficult.

Eriogonum kennedyi var. *austromontanum* is described by Hickman (1993) as: Perennial with a branched, woody caudex, forming loose leafy mats; leaves oblanceolate to elliptic, tip acute, blades 6-10 mm long, often sheathing up from the stem; inflorescences head-like, generally \pm tomentose, axis 8-15 cm; bracts scale-like, subtending involucre; involucre 2.5-4 mm, sessile, rigid, \pm hairy with 5-7 teeth. Perianth 2-3 mm, white to rose, glabrous, lobes \pm widely elliptic, stalk-like base 0. Fruit 3.5-4 mm.

Eriogonum kennedyi var. *austromontanum* and *Eriogonum kennedyi* var. *kennedyi* overlap in range and habitat and are difficult to distinguish. Reveal (1989) felt that leaf length was the most reliable characteristic in differentiating the two varieties. Overlap in leaf length has been observed in specimens assigned to each variety (USDA Forest Service 2002a). *Eriogonum kennedyi* var. *austromontanum* appears to be extremely variable. However, part of this may be due to confusion with *Eriogonum kennedyi* var. *kennedyi*.

Because *Eriogonum kennedyi* var. *austromontanum* and *E. kennedyi* var. *kennedyi* are so closely related and have the same basic growth form, it is likely that have a similar response to fire. Krantz (1981) documented the post-fire response of *E. kennedyi* var. *kennedyi* after the 1976 Coyote Fire within the Coxe Meadow Pebble Plain Complex. Plants infrequently resprouted from their caudices, and he observed little regeneration from seedlings. Post-fire effects to *E. kennedyi* var. *kennedyi* were monitored for 2 years following the September 1999 Willow Fire, with the same results. Occurrences of *E. kennedyi* var. *kennedyi* that burned at high intensity did not re-sprout after fire and exhibited no regeneration from seed observed during the 2-year monitoring period (USDA Forest Service 2002b).

Eriogonum wrightii var. *subscaposum* also resembles *Eriogonum kennedyi* var. *austromontanum* in that it has loosely matted leaves. However, the strongly branched inflorescence of *Eriogonum wrightii* var. *subscaposum* is an obvious difference.

Habitat Description

Eriogonum kennedyi var. *austromontanum* occurs almost exclusively on pebble plains. *Eriogonum kennedyi* var. *austromontanum* almost always grows in association with *Arenaria ursina* and is considered to be a very strong indicator of pebble plain habitat. The species occurs at elevations of 6,720-9,475 feet (2,050-2,890 meters) and is generally associated with rocky sites within the habitat

(California Natural Diversity Database 2004; USDI Fish and Wildlife Service 2001).

Pebble plain habitat occurs across approximately 4,000 acres on National Forest System, private, and state lands. The San Bernardino National Forest supports approximately 3,322 acres of this habitat. Pebble plain habitat does not occur on any other forest within the southern California national forests (or beyond).

Occurrence Status

Populations on National Forest System lands remain vulnerable and are declining, although the rate of decline has been reduced through a variety of measures to prevent impacts to individual plants and habitat. Completion of the revision to the Pebble Plain Habitat Management Guide and implementation of recommended protection measures, and an increase in public education and research are expected to continue to slow the rate of decline (USDA Forest Service 2002a).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Eriogonum kennedyi* var. *austromontanum* (Southern mountain buckwheat)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1988 2004	North Baldwin Lake and Mojave View Units of the pebble plains preserve system. ORV's, dumping, burros = past threats. Exotic plants (<i>Bromus tectorum</i>) = present threat. Site damaged in 1992 by illegal trespass by landfill truck. SBNF, CDFG, TNC, PVT.	SBD
3	U	1979	Near Snake Spring, ca. 1.3 air mi. NE of Shay Mountain, San Bernardino Mtns. w/ <i>Arabis parishii</i> . Needs fieldwork. SBNF.	SBD

6	U	1979	Canyon tributary to Willow Canyon, ca. 0.3 air mi. N of Burns Spring, San Bernardino Mtns. Growing w/ <i>Arabis parishii</i> . Fieldwork needed. SBNF.	SBD
7	U	1988	N and W of Sugarloaf, from NE edge of Moonridge to NE edge of Sugarloaf. Co-dominant w/ <i>Arenaria ursina</i> one pebble plains in the Sugarloaf area. Other rare plants incl. <i>Arabis parishii</i> , <i>Astragalus leucolobus</i> , <i>Ivesia argyrocoma</i> , <i>Linanthus killipii</i> , <i>Mimulus purpureus</i> , <i>Phlox dolichantha</i> . ORV use, burro activity, development, invasive weeds. TNC, SBNF.	SBD
9	U	1988	S of Sugarloaf, from edge of town to water tank. Pebble plain surrounded by conifer forest. Rare associates = <i>Arabis parishii</i> , <i>Arenaria ursina</i> , <i>Ivesia argyrocoma</i> , <i>Castilleja cinerea</i> . Pebble plain near water tank has been nearly denuded of vegetation due to ORV activities. SBNF.	SBD
10	U	1977	SE of Sugarloaf, ca. 0.25 mi. N of Green Spot Picnic Area. SBNF.	SBD
11	U	1979	Woodlands, between the town and Deadman Ridge. Land owner: U.	SBD

12	U	1981	S of Big Bear Lake, to the N of Hwy 18 btw. Boulder Bay and Metcalf Bay. On clay soils w/ Saragosa quartzite surrounded by <i>Pinus jeffreyi</i> forest. Most of the habitat for this plant has been destroyed along the S shore of the lake due to urbanization. PVT.	SBD
13	U	1981	S shore of Big Bear Lake, E of Metcalf Bay from Forest Rd and Canvasback Rd E to Bonanza Trail. On clay soils w/ Saragosa quartzite cobbles. Found growing with other pebble plain species. Several areas including vacant lot next to animal hospital on Bonanza Trail. PVT development has extirpated most populations on the S shore of Big Bear Lake.	SBD
14	U	1988	Eagle Point, Big Bear Lake. Associates = <i>Ivesia argyrocoma</i> , <i>Castilleja cinerea</i> . <i>Pinus jeffreyi</i> forest surrounds the site. Part of the site to be managed by TNC. PVT habitat is being lost/damaged by development, ORV use, invasive weeds, excessive human visitation. Primarily meadow habitat w/ small areas of pebble plain plants.	SBD
15	U	1977	Snow Point, E of Red Ant Canyon. Associated w/ several other rare plants. Derby found this plant only in the northern polygon at this map number. Needs fieldwork. Land owner: U.	SBD

16	U	1988	Lower Holcomb Valley area incl. NW slope of Bertha Peak. Co-dominants incl. <i>Arenaria ursina</i> , <i>Ivesia argyrocoma</i> . Also w/ <i>Castilleja cinerea</i> , <i>Arabis parishii</i> . A road bisects one pebble plain. Part of site owned by Boy Scouts of America; CDF is encouraging them to plant pines on their inholdings. PVT/SBNF.	SBD
17	U	1988	Upper Holcomb Valley, from Belleville and Wilbur Grave to Van Dusen Canyon. Pebble plains surrounded by <i>Pinus jeffreyi</i> forest. Associates = <i>Arenaria ursina</i> , <i>Ivesia argyrocoma</i> , <i>Viola douglasii</i> , <i>Erigeron aphanactis congestus</i> . Development could threaten. SBNF.	SBD
18	U	1977 2004	Burnt Flat, ca. 0.5 air mi. SSW of Mohawk Mine. SBNF.	SBD
19	U	1978 2004	Arrastre and Union Flats, ca. 2.5 air mi. N of Big Bear City. On pebble plains w/ <i>Ivesia argyrocoma</i> , <i>Castilleja cinerea</i> , <i>Arabis parishii</i> . w/in a <i>P. jeffreyi</i> forest. SBNF.	SBD
20	U	1979	Just S of Jacoby Spring, ca. 1.0 air mi. N of Doble Mine, San Bernardino. w/ <i>Castilleja cinerea</i> . Needs fieldwork. SBNF.	SBD
21	U	1977	Johnston Grade, ca. 1 air mi. E of Doble. Growing w/ <i>Arenaria ursina</i> , <i>Arabis parishii</i> , <i>Castilleja cinerea</i> , <i>Echinocereus engelmannii</i> . Both sides of Hwy 18. SBNF.	SBD

22	U	1977	Gold Mountain, ca. 0.4 air mi. SW of summit. SBNF.	SBD
23	U	1988	SE slope of Gold Mountain, ca. 1 air mi. SE of summit, overlooking Baldwin Lake. w/ <i>Arabis parishii</i> , <i>Arenaria ursina</i> , <i>Ivesia argyrocoma</i> , <i>Castilleja cinerea</i> , <i>Echinocereus engelmannii</i> , <i>Linanthus killipii</i> . Woodcutting, ORV use, Forest Road intersects both upper and lower pebble plains. <i>Bromus tectorum</i> present on lower pebble plains. Surrounded by pinyon-juniper woodland. SBNF.	SBD
24	U	1977	Gold Hill, S of Baldwin Lake, San Bernardino Mtns. On pebble plains w/ <i>Arenaria ursina</i> , <i>Arabis parishii</i> , <i>Echinocereus engelmannii</i> , <i>Castilleja cinerea</i> , <i>Linanthus killipii</i> . Needs fieldwork. SBNF.	SBD
276727 (RSA)	U	1978	San Bernadino Mts: abandoned cemetery 0.4 air miles ESE of site of Doble, N. of Baldwin Lake; SW 1/4 of S. 31 T3N, R2E. (Emmel)	SBD
196995 (RSA)	U	1966	San Bernadino Mountains, Nelson Ridge, about 1/2 mile north of Baldwin Lake. T2N, R2E, sec. 5 (Holmgren)	SBD
300734 (RSA)	U	1979	Near the summit of Sugarloaf Mountain off of FS trail 2E18. San Bernadino Mountains, San Bernadino National Forest. Elevation: 9900 ft. (Shevock)	SBD

393546 (RSA)	U	1932	Vicinity of Barton Flats, SBNF (Templeton)	SBD
364122 (RSA)	U	1975	Isolated tract, sec. 23 near Sawmill Canyon, SBNF (Thorne)	SBD
302315 (RSA)	U	1978	Just W of Hitchcock Ranch on 3N12, elevation ca. 7150 ft. SBNF (Thorne)	SBD
601929 (RSA)	U	1933	Ridge N Baldwin Lake. San Bernadino Mts. Alt. 6890 ft. (Wheeler)	SBD
491692 (RSA)	U	1987	Along Hwy 38, 2.8 miles southeast of the jct. of Hwy 18, near the community of Woodlands, about 2 airline miles southeast of Big Bear City; T2N R2E S19; elev. 6750 ft (Reveal)	SBD
*	U	2004	Directly south of Rattlesnake Canyon and north of Antelope Creek. Many plants killed by severe drought. (VinZant/USFS)	SBD
*	U	2003	Broom Flat and Juniper Springs Group Camp. From Onyx Peak to Rose Valley. Threatened by cattle trespass, weed infestation and unauthorized roads. (Ward/USFS)	SBD
805118 (CalFlora 2005)	U	1989	Bear Valley, hill in SW ¹ / ₄ of SW ¹ / ₄ Section 31, T3N, R2E 6800 feet elevation (Taylor)	SBD

108908 (UCR)	U	1997	East of Holcomb Valley: Arrastre Flat, Holcomb Valley Rd (USFS 3N16), 1.0 road mi W of the junction with 3N02, T3N/R1E/S34 (White/UCR)	SBD
17502 (UCR)	U	1979	1 mi. N of Baldwin Mine (Vasek/UCR)	SBD
24619 (UCR)	U	1979	NW of Baldwin Lake towards Gold Mtn, Parcel 2 proposed fro Wild Animal park, 2N/R2E/S1 (Krantz/UCR)	SBD
24616 (UCR)	U	1978	Holcomb Valley. S of Holcomb Valley Campground (Krantz/UCR)	SBD
24622 (UCR)	U	1976	Big Bear Lake [Sawmill Pebble Plain?] T2N/R1E/S23	SBD
123738 (UCR)	U	2001	San Bernardino, South of Baldwin Lake, ca. 0.6 mi. SE of the Jct. of CA Hwy 38 and Shay Rd. Slopes near the Los Vaqueros de las Montanas Arena (horse arena)	SBD
141430 (UCR)	U	1975	NW Holcomb Valley, just N of Holcomb Creek crossing of 3N12, 5.9 mi. from Fawnskin (Latting/UCR)	SBD
141500 (UCR)	U	2004	San Bernardino, Big Bear Valley, S of Big Bear Lake at Metcalf Bay, E side of Cienega Rd., S of Big Bear Blvd. (Hwy. 18), west of Drive-in Theater.	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*

- *SBD = San Bernardino County*

Threats

Some of the original pebble plain habitat was destroyed upon the creation of Big Bear Lake. Residential and commercial development and other high-impact land uses have also contributed to habitat loss; this development continues today.

On National Forest System lands, *Eriogonum kennedyi* var. *austromontanum* populations are declining due to increased recreation use, existing roads and trails bisecting habitat, road and trail maintenance, mining, prospecting, and unauthorized uses such as off road driving by motorized and mechanized vehicles, cattle trespass, target shooting, dumping and fuel wood collection. Continued use of improvements such as developed recreation sites, and lands under special use permit completed in the past also degrades habitat. The introduction and spread of invasive nonnative species also degrades habitat (USDA Forest Service 2002).

Despite these impacts, the rate of habitat decline on the Forest has decreased due to recent and ongoing habitat protection measures. Although impacts could not be entirely eliminated, barriers and signs have been installed to direct recreational use within the footprint of the sites and to educate the public as to why these measures are needed. Eight road segments affecting pebble plain habitat were decommissioned in 1999 and a full time resource officer was hired for the Big Bear area of the SBNF. This has resulted in timely fence repairs, rapid disguise of user created roads and trails as they are developed and an increase in public environmental awareness. Special use events previously located in habitat have also been relocated or the events have been modified to eliminate effects. The designation of specific locations for target shooting and closure of the Mountaintop District to dispersed shooting, and the 1998 removal of burros from the Big Bear City area has also reduced impacts to this species. The Pebble Plain Habitat Management Guide was updated in 2002, and Forest-level planning was conducted to explore methods to protect habitat over the long term in the Forest Plan Revision.

Pebble Plain habitat also faces a new threat. With the recent drought induced death of conifers on the forest, some locations of occupied habitat on NFS lands adjacent to housing communities, developed recreation sites, or sites under special use permit are in need of treatments to reduce fuel loading. Proposed fuel treatments within the Wildland Urban Interface defense and threat zones at these locations could cause direct or indirect affects to habitat. In most instances, vegetation management with pebble plain habitat can usually be avoided due to the low continuity of a large fuel bed, however removing vegetation adjacent to habitat increases the potential for unauthorized motorized access. This is a substantial concern for defense zones constructed adjacent to communities of Big Bear Lake, Big Bear City, Baldwin Lake, and Fawnskin where unauthorized motorized use is an ongoing factor in habitat degradation. With the concern for wildland fire, comes the increased potential for emergency fuelbreak construction adjacent to housing communities and within areas that are located further in to the forest to connect into the fuelbreak system. Emergency fuelbreak construction can cause a high degree of long term damage within a very short period of time.

Without knowing and including the full extent of the potential Wildland Urban Interface threats, habitat conditions on NFS lands should improve over time as long as the recommendations in the SBNF Pebble Plain Habitat Management continue to be implemented, and the long-term beneficial effects of the Pebble Plain Biological Opinion action items are realized.

Conservation and Management Considerations

The primary conservation strategy for *Eriogonum kennedyi* var. *austromontanum* is to implement the Pebble Plain Habitat Management Guide and to improve the knowledge of its distribution and relationships to closely related taxa. The following is a list of conservation practices that should be considered for this species:

- Implement strategies within the Pebble Plain Habitat Management Guide to the greatest extent practicable.
- Utilize the habitat suitability criteria and detection protocol developed for this taxon and apply to surveys at the project level. This will help to ensure that future projects and management actions with effects to this taxon will trigger the appropriate standards, even where occurrences are currently not known.
- Survey all new occurrences of *Eriogonum kennedyi* var. *austromontanum* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Eriogonum kennedyi* var. *austromontanum* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Eriogonum kennedyi* var. *austromontanum* in the area using NRIS data collection standards, and incorporate these occurrences into the corporate GIS database.

Evaluation of Current Situation and Risks on National Forest System Lands

Eriogonum kennedyi var. *austromontanum* is a locally-common narrow endemic species known only to occur in the eastern San Bernardino Mountains, entirely on pebble plain habitat. Some of this pebble plain habitat is protected from identified threats, although most others are not well protected. A large number of threats have been mitigated but will remain ongoing. The long-term effects of proposed fuel treatments are unknown.

Based on the above analysis, *Eriogonum kennedyi* var. *austromontanum* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	A	A	C	B	C	A

Eriogonum kennedyi var. *austromontanum* is listed under the Endangered Species Act of 1973, as amended, as threatened, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level. The viability of this species is entirely tied to protection and management of pebble plain habitat. Existing protections afforded this species under the Endangered Species Act provide considerable baseline protection.

Consideration of the Suitable Use restricting vehicle travel to Forest System roads and trails, along with Standards related to listed plant management, mining, and recreation management factor into the outcomes. The recommended Arrastre and Wildhorse Research Natural Areas, the Gold Mountain Critical Biological zone, the recommended Sugarloaf Wilderness, where applied, are important to the outcomes; some of these are essential for favorable viability outcomes. Presumed implementation of the Pebble Plain Habitat Management Guide is key to these outcomes under all alternatives. To provide for viability and recovery of this species, some of the most important habitat for this species must be clearly and substantially protected.

Under all alternatives 858 of the 1,096 acres of occupied habitat would continue to be protected within the North Baldwin Lake Holcomb Valley Special Interest Area (SIA). Under Alternatives 2-6 this taxon would receive increased protection within this SIA due to Standard S33 that ensures protection of habitat through environmental analysis when new projects are proposed. SBNF Standard S2 would also provide an increased level of protection for pebble plain habitat in Alternatives 2-6. SBNF Standard S1 that protects host plants for *Castilleja cinerea* would also provide protection for this taxon as it is one of only several host plants for *Castilleja cinerea*.

Under Alternatives 2-6 an occurrence of *Eriogonum kennedyi* var. *austromontanum* located at the non-operational Snow Forest Ski Area would receive increased protection as this special use permit is discontinued. Ten acres of occupied habitat are located within eligible wild and scenic river designations under alternatives 2, 3, 4, 4a, and 6.

Under Alternative 1, pebble plain habitat in general, and *Eriogonum kennedyi* var. *austromontanum* in particular, would continue to be at risk from unauthorized vehicle travel off Forest Transportation System roads and trails. Conservation actions completed under the Southern California Conservation Strategy and its ongoing monitoring requirements would be retained. There are no new

recommendations for special area designations. Current levels of Back Country zoning would be retained.

Under Alternative 2, the Gold Mountain Critical Biological zone, the Arrastre and Wildhorse recommended Research Natural Areas, the recommended sugarloaf wilderness (small alternative) and Back Country Non-Motorized zoning on the north side of Sugarloaf would provide substantial protection for this species.

Under Alternative 3, the Union and Gold Mountain Critical Biological zones, the Arrastre and Wildhorse recommended Research Natural Areas, and the recommended Sugarloaf wilderness (large extent) would provide substantial protection for this species. An increase in Back Country Non-Motorized zoning would occur.

Under Alternative 4, the recommended Sugarloaf wilderness (full extent) would provide protection for a large portion of the species range, however the important protections associated with Research Natural Area designations and the Gold Mountain Critical Biological zone would not occur. Current levels of Back Country zoning would remain about the same.

Under alternative 4a, The Gold Mountain Critical Biological zone, the Arrastre Flat and Wildhorse Meadow Research Natural Areas, and increased acres of Back Country Non-Motorized and Back Country Motorized Use Restricted zoning would provide a higher level of protection for this taxon.

Under Alternative 5, land use zoning would not provide any protection, nor are any special area designations recommended. Due to the projected rise of motorized use, this alternative would be expected to increase the ongoing degradation from motorized and mechanized travel.

Under Alternative 6, increased use of Back Country Non-Motorized zoning across the range of the species, use of Back Country Motorized Use Restricted zoning, recommendations for the Arrastre and Wildhorse Research Natural Areas, the Union and Gold Mountain Critical Biological zones, and the Sugarloaf proposed wilderness (large extent) would provide substantial protection.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

The pebble plain habitat for *Eriogonum kennedyi* var. *austromontanum* on private lands in Big Bear

Valley has been highly reduced and fragmented by residential and commercial development. There are a few locations under long-term management on state lands however the remaining fragments on private land will continue to be lost as continued development occurs. This loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF. By maintaining the current distribution of *Eriogonum kennedyi* var. *austromontanum* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Eriogonum kennedyi* var. *austromontanum* suffer a decline in its overall distribution, however the population conditions of *Eriogonum kennedyi* var. *austromontanum* on private land will likely result in the loss of populations.

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**Eriogonum kennedyi var.
alpigenum**

**Eriogonum microthecum var.
corymbosoides**

Eriogonum microthecum* var. *corymbosoides

Eriogonum microthecum Nutt. var. *corymbosoides* Rev. (San Bernardino buckwheat)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: not rated (California Natural Diversity Database)

California Native Plant Society (2001): not rated (California Native Plant Society 2001).

General Distribution

Eriogonum microthecum var. *corymbosoides* is endemic to carbonate soils on the northern slopes of the San Bernardino and (possibly) San Gabriel Mountains (CalFlora 2002, Hickman 1993).

Distribution in the Planning Area

All current documented occurrences of *Eriogonum microthecum* var. *corymbosoides* on National Forest System lands are on the San Bernardino National Forest. This taxon is locally common across the carbonate belt of the San Bernardino Mountains from White Mountain to the Onyx Peak area, and on Bertha and Sugarloaf ridges near Big Bear Lake. Suitable habitat is present on the Angeles National Forest (USDA Forest Service 2002); there is one historical record in the Jepson Herbarium from the summit of Table Mountain in the San Gabriel Mountains, collected in 1934 (CalFlora 2002) - this specimen should be examined to rule out *E. m.* var. *johnstonii*.

Taxonomy and Natural History

Eriogonum microthecum var. *corymbosoides* is a dicotyledon in the buckwheat family (Polygonaceae). It is one of eight varieties of *E. microthecum*. The rare Johnston's buckwheat (*E. microthecum* var. *johnstonii*) is the only other variety that occurs in the range of this taxon.

Eriogonum microthecum var. *corymbosoides* is a perennial, deciduous shrub that blooms July-September (California Native Plant Society 2001). It is 30-60 cm. The leaf blades are 8-25 mm. The

upper leaves are generally the largest and are more or less oblong and more or less flat. The inflorescence is dense and flat-topped. The perianth is brownish (Hickman 1993).

Habitat Description

Eriogonum microthecum var. *corymbosoides* occurs in pinyon-juniper woodlands at elevations of 5,000–9,000 feet (1,800–2,900 meters) (California Native Plant Society 2001). It is strongly associated with carbonate soils, but can also occur on granitic soils.

Occurrence Status

The distribution of this species on the San Bernardino National Forest is fairly well known, and its population status and trends apparently stable except for habitat losses associated with limestone mining (USDA Forest Service 2002).

The table shows the recorded occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Eriogonum microthecum* var. *corymbosoides* (San Bernardino buckwheat)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
*	250	2001	Along PCT, just W of Bertha Peak. Plants scattered in 3 main patches. Dolomite soils, open <i>Cercocarpus ledifolius</i> woodland w/ <i>Artemisia tridentata</i> var. <i>tridentata</i> , <i>Elymus elymoides</i> , <i>Cordylanthus rigidus</i> ssp. <i>setigerus</i> . No visible disturbance, but recreational use off of the designated trail is a potential threat. SBNF.	SBD
*	U	2001	E and W of JCT of FR 2N77/3N16. ca. 1-1.5 mi. N and slightly W of Hitchcock Spring. Carbonate substrate. No site-specific info. SBNF.	SBD

*	U	1998	ca. 1/3 mi. ENE of Monarch Flat. Rocky slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Aspect 326 ° , slope 28 ° . SBNF.	SBD
*	U	1998	ca. 1 mi. N of Hitchcock Ranch. Rocky slope w/ <i>Oxytheca parishii</i> var. <i>goodmaniana</i> , <i>Arabis shockleyi</i> . Aspect 158 ° , slope 30 ° . SBNF.	SBD
*	< 5	1998	ca. 0.5 mi. SSE of Monarch Flat. Rocky gradual slope intersected by a road. w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> var. <i>goodmaniana</i> , <i>Arabis shockleyi</i> . SBNF.	SBD
*	U	1998	ca. 1.2 mi. W of Blackhawk Mine. Canyon bottom beneath rock walls. Aspect 350 ° , slope 10 ° . SBNF.	SBD
*	U	2001	ca. 2 mi. NNE of Hitchcock Spring. Carbonate substrate. No site-specific data. SBNF.	SBD
*	U	1998	S of Smarts Ranch Rd., btw. Smart Spring and Squirrel Spring. Gentle slope of foothills community. w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Abronia nana</i> ssp. <i>covillei</i> . Aspect 273 ° . SBNF.	SBD
*	U	1998	ca. 1.3 mi. ESE of Mineral Mtn. W/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Abronia nana</i> ssp. <i>covillei</i> . Aspect 20 ° , slope 17%. SBNF.	SBD

*	U	1998	Nelson Ridge, ca. 0.5 mi. S of Cactus Spring. Mountainside W of draw. Some burned logs, branches, and <i>Pinus monophylla</i> . W/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Aspect 74 ° , slope 32 ° . SBNF.	SBD
*	U	1998	ca. 1.2 mi. SSE of JCT of Wildhorse and Furnace canyons. Rocky cobbly slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Arabis shockleyi</i> . Aspect 123 ° , slope 22 ° . SBNF.	SBD
*	U	1998	ca. 1 mi. NW of Mohawk Mine. Rocky upper slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> ssp. <i>goodmaniana</i> , <i>Abronia nana</i> ssp. <i>covillei</i> , <i>Arabis shockleyi</i> , <i>Hulsea vestita</i> ssp. <i>parryi</i> . Aspect 72 ° , slope 34 ° . SBNF.	SBD
*	U	1998	ca. 0.5 mi. S and SSW of Terrace Springs. Rocky upper slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> and <i>Arabis shockleyi</i> . Aspect 52 ° , slope 30 ° . SBNF.	SBD
*	U	1998	Ca. 0.5 mi. S of Arctic Canyon Pit. Steep rocky talus slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Hulsea vestita</i> , <i>Arabis shockleyi</i> . Aspect 34 ° , slope 35 ° . Located near limestone quarries. SBNF/Mitsubishi Cement Corp.	SBD

*	U	1998	Ca. 0.75 mi. E of JCT of Wildrose and Furnace canyons. Moderately steep limestone cobbly slope above trail to Furnace Canyon. Site is very open with moderate vegetation cover. W/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Arabis shockleyi</i> , <i>Abronia nana</i> ssp. <i>covillei</i> , <i>Dudleya abramsii</i> . Aspect 240 ° , slope 45%. SBNF/Mitsubishi Cement Corp.	SBD
*	U	1998	ca. 1.3 mi. ESE of Arctic Canyon Pit. Rocky steep upper slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Aspect 24 ° , slope 42 ° . Located above limestone quarry. SBNF/Mitsubishi Cement Corp.	SBD
*	U	1998	ca. 1 mi. SW of Monarch Flat. Steep rocky slope above N side of canyon w/ <i>Astragalus albens</i> , <i>Erigeron parishii</i> , <i>Arabis shockleyi</i> . Aspect 70 ° , slope 30 ° . Mining use near plot. SBNF/Mitsubishi Cement Corp.	SBD
*	U	1998	Several patches along ridgeline from immediately NW of Sugarloaf summit to ca. 1.5 mi. E of summit. (incl. habitat within Bear Mtn. Ski Resort operating area) W/ <i>Lesquerella kingii</i> ssp. <i>bernardina</i> , <i>Abronia nana</i> ssp. <i>covillei</i> , <i>Packera ionophylla</i> . SBNF.	SBD

*	U	1998	Ca. 0.25 mi. WSW of White Mountain summit, San Bernardino Mtns. Steep cobbly, colluvial slope. W/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> ssp. <i>goodmaniana</i> , <i>Arabis shockleyi</i> . Aspect 210 ° , slope 40%. SBNF.	SBD
*	U	1998	ca. 1.2 mi. S of JCT of Furnace and Wildrose canyons. Moderate colluvial slope w/ cobbly limestone surface. W/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> ssp. <i>goodmaniana</i> , <i>Arabis shockleyi</i> . Aspect 210 ° , slope 35%. SBNF.	SBD
*	U	1998	Ca. 1 mi. ESE of JCT of Furnance and Wildrose canyons. Talus slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Arabis shockleyi</i> . Aspect 80 ° , slope 30 ° . SBNF.	SBD
*	U	1998	Ca. 0.5 mi. W and 0.5 mi. WNW of Mineral Mountain summit. Mountain slope just above a small wash w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Arabis shockleyi</i> . Aspect 96 ° , slope 22 ° . SBNF.	SBD
*	U	1998	Tip Top Mountain to ca. 0.5 mi. W of Tip Top Mountain. Toe slope with carbonate colluvium. W/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> ssp. <i>cienezensis</i> , <i>Arabis shockleyi</i> . Aspect 213 ° , slope 25 ° . SBNF.	SBD

*	U	1998	Ca. 1/3 mi. ESE of Jacoby Spring. Bench on side slope of limestone. W/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Aspect 220 ° , slope 10%. SBNF.	SBD
*	U	1998	Ca. 1 mi. WNW of Mineral Mountain summit. Rocky upper slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Aspect 10 ° , slope 43%. SBNF.	SBD
*	U	1998	Ca. 1.5-2 mi. NW of Tip Top Mountain. Rocky slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Abronia nana</i> ssp. <i>covillei</i> . Aspect 52 ° , slope 18 ° . SBNF.	SBD
*	U	1998	On ridge immediately NNE and NE of Granite Spring. Steep rocky slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Aspect 30 ° , slope 60%. SBNF.	SBD
*	U	1998	ca. 0.75 mi., 1 mi. E of Cactus Spring. Slope with rock outcrop. Occurs w/ <i>Astragalus albens</i> , <i>Erigeron parishii</i> . Aspect 252 ° , slope 24 ° . SBNF.	SBD
*	U	1998	On ridge ca. 1/4-1/3 mi. NW of Granite Spring. Steep rocky slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> . Aspect 356 ° , slope 28 ° . SBNF.	SBD

*	U	1998	Ca. 0.8 mi. ESE of Mineral Mountain summit. Bench area with outcrop on steep slope above drainage. W/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Arabis shockleyi</i> . Aspect 100 ° , slope 18%. SBNF.	SBD
*	U	1998	Ca. 0.5 mi. NW of Tip Top Mountain summit. W-facing slope above gully w/ <i>Oxytheca parishii</i> ssp. <i>cieneensis</i> , <i>Abronia nana</i> ssp. <i>covillei</i> . Aspect 275 ° , slope 18 ° . SBNF.	SBD
*	U	1998	Ca. 0.25 mi. NE and E of Tip Top Mountain. Slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> ssp. <i>cieneensis</i> , <i>Abronia nana</i> ssp. <i>covillei</i> , <i>Arabis shockleyi</i> . Aspect 140 ° , slope 10 ° . SBNF.	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Eriogonum microthecum var. *corymbosoides* is threatened by vehicle use off of designated roads, ski area development, vegetation/fuels management, and mining. Habitat for *Eriogonum microthecum* var. *corymbosoides* continues to be lost to limestone mine development on National Forest System lands and private lands north of the San Bernardino National Forest boundary

Eriogonum microthecum var. *corymbosoides* may be threatened by intense fires. Post-fire vegetation monitoring two years after the September 1999 Willow Fire on the San Bernardino National Forest found that *Eriogonum microthecum* var. *corymbosoides* plants that burned with medium and high intensity did not resprout, and no regeneration by seed was observed (USDA Forest Service 2002).

Conservation and Management Considerations

The primary conservation strategy for *Eriogonum microthecum* var. *corymbosoides* is to implement the Carbonate Habitat Management Strategy. The following is a list of conservation practices that should be considered for *Eriogonum microthecum* var. *corymbosoides*:

- Implement the Carbonate Habitat Management Strategy.
- Survey all new occurrences of *Eriogonum microthecum* var. *corymbosoides* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Eriogonum microthecum* var. *corymbosoides* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least five years prior.
- Map known and new occurrences of *Eriogonum microthecum* var. *corymbosoides* on NFS lands using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Eriogonum microthecum var. *corymbosoides* is narrowly distributed on carbonate soils of the northern San Bernardino Mountains. Within this range it is widespread and locally common. While some of the recorded occurrences are vulnerable to identified threats, many are remote and inaccessible to vehicle impacts. Much of the suitable habitat distributed across the carbonate areas of the forest are also not vulnerable to vehicle impacts. Mining impacts will be addressed at the project level, and will be guided by provisions of the Carbonate Habitat Management Strategy. Based on this analysis, *Eriogonum microthecum* var. *corymbosoides* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Eriogonum microthecum var. *corymbosoides* is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Eriogonum microthecum* var. *corymbosoides* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Eriogonum microthecum* var. *corymbosoides* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Eriogonum microthecum* var. *corymbosoides* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Eriogonum kennedyi var.
austromontanum

Eriogonum microthecum var.
johnstonii

Eriogonum microthecum var. **johnstonii**

Eriogonum microthecum Nutt. var. *johnstonii* Rev. (Johnston's buckwheat)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G51; S1.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Eriogonum microthecum var. *johnstonii* is endemic to the San Gabriel and eastern San Bernardino mountains in Los Angeles and San Bernardino counties (Hickman 1993).

Distribution in the Planning Area

All known occurrences of *Eriogonum microthecum* var. *johnstonii* are on National Forest System lands. There are seven occurrences listed in the California Natural Diversity Database (2004). Two occurrences are historical; despite recent survey efforts, *Eriogonum microthecum* var. *johnstonii* has not been relocated at either of these sites (California Natural Diversity Database 2004). Five occurrences are on the Angeles National Forest (Head of Mescal Creek, Mt. San Antonio, along Baldy Trail, McClellan flat, Upper, Eastern peak along Table Mountain), and three are on the San Bernardino National Forest (two occurrences on Cucamonga Peak and one at Coon Creek Jumpoff (south of Onyx Peak) (Mistretta and Brown 1996). The Coon Creek occurrence is disjunct by approximately 50 miles. A population of *Eriogonum microthecum* on private land in the City of Big Bear Lake, provisionally identified as *Eriogonum microthecum* var. *johnstonii* (Mistretta and Brown 1996), now appears instead to be an undescribed taxon, and a description is currently in preparation (Sanders pers. comm.).

Taxonomy and Natural History

Eriogonum microthecum var. *johnstonii* is a dicotyledonous plant in the buckwheat family (Polygonaceae). *Eriogonum microthecum* is a highly variable species. One of the eight varieties of this

species, San Bernardino buckwheat (*E. m. var. corymbosoides*), overlaps with *E. m. var. johnstonii* in distribution.

Eriogonum microthecum var. *johnstonii* is a deciduous subshrub or shrub that flowers July–September (California Native Plant Society 2001). Like most *Eriogonum* taxa, Johnston's buckwheat is an obligate outcrosser, pollinated by generalist pollinators (Mistretta and Brown 1996). Seedling establishment is thought to be uncommon and episodic, and the plant is never common; growth rates are slow and individual plants may be up to 30 years old. Associated species include *Abies concolor*, *Arctostaphylos patula*, *Cercocarpus ledifolius*, *Eriogonum saxatile*, *Eriogonum umbellatum*, *Eriogonum wrightii* var. *subscaposum*, *Heuchera abramsii*, *Holodiscus microphyllus* var. *microphyllus*, *Juniperus californica*, *Leptodactylon pungens*, *Pinus jeffreyi*, *Pinus lambertiana*, and *Pinus murryana*. (Mistretta and Brown 1996)

Eriogonum microthecum var. *johnstonii* is a perennial subshrub-shrub 6-13 cm tall. Leaf blades are 5-10 mm, elliptic to ovate, and thinly hairy above. The main branches of the inflorescence are generally less than 1 cm. The perianth is brownish (Hickman 1993).

Habitat Description

Eriogonum microthecum var. *johnstonii* occurs on dry rocky sites in upper montane and subalpine coniferous forests (California Native Plant Society 2001, California Natural Diversity Database 2001) between elevations of 6,000–9,600 feet (1,830–2,925 meters), typically on exposed slopes and ridges with loose rocky soils. It has been found on limestone soils, but most occurrences are on granitic substrates. (Mistretta and Brown 1996)

Occurrence Status

The six known occurrences contain an estimated 3- to 4-thousand plants, with populations ranging from 50–1,500 individuals. The Angeles National Forest supports 150 acres (61 hectares) of occupied habitat and approximately 64% of known plants (Mistretta and Brown 1996). Despite extensive surveys, no additional occurrences have been found in the eastern San Gabriel Mountains.

The two occurrences on Cucamonga Peak are within the fire perimeter of the 2003 Grand Prix fire. These have not been visited since the fire and their current status is not known.

The table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Eriogonum microthecum* var. *johnstonii* (Johnston's buckwheat)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
3	700	1980	West spur of Mt. San Antonio. Steep ridge of granite talus with <i>Castinopsis sempervirens</i> . Foot traffic in the area is light. ANF.	LA
4	U	U	ca. 0.3 mi. SW of Cucamonga Peak (2 occurrences) SBNF.	SBD
5	0 in 1979	revisited in 1979	Head of Mescal Creek. Historical collection of unknown date; area resurveyed in 1979 and no plants found. ANF	LA
6	0 in 1979	1917, 1979	Along Baldy Trail, southwest of Mount San Antonio summit on Ridge. ANF.	LA
8	1000 in 3 eastern colonies and 740 in two western colonies in 1980; ca. 800 in 1994.	1980, 1994	Ridgeline extending NE of Cucamonga Peak summit. Five colonies extend over 0.65 miles. Threats: trampling by bighorn sheep, overcollecting, adjacency to Cucamonga Peak Trail. Open areas on limestone outcrops with <i>Pinus murrayana</i> , <i>Abies concolor</i> , <i>Cercocarpus ledifolius</i> , <i>Arctostaphylos</i> sp., <i>Holodiscus</i> sp., <i>Ribes</i> sp., <i>Eriogonum wrightii</i> . SBNF within Wilderness Area.	SBD

10	500-700 in 1981.	1981	McClellan Flat, south of Camp McClellan, along Table Mountain Road. Road construction and development have eliminated denser parts of population (approx 30%). Also threatened by trampling and mining. Open Jeffrey pine forest on limestone with understory of <i>Ceanothus cordulatus</i> , <i>Artemisia tridentata</i> , <i>Symphoricarpos</i> sp., and <i>Eriogonum umbellatum</i> ssp. <i>munzii</i> . ANF.	LA
11	> 700	1981	Eastern peak along Table Mountain, approximately 0.6 mi. east of Smithsonian Observatory. Threats include telephone and observatory expansion and maintenance, mining, camping. Area may be within a mineral claim. <i>Pinus monophylla</i> , <i>Pinus jeffreyi</i> , and <i>Cercocarpus ledifolius</i> ecotone. Associated with <i>Eriogonum umbellatum</i> var. <i>munzii</i> , <i>Artemisia tridentata</i> , <i>Phlox diffusa</i> , <i>Symphoricarpos</i> , and <i>Ceanothus greggii</i> var. <i>vestita</i> . ANF.	LA
572050 (RSA)	350 estimated	2004	On ridgeline e. of Cucamonga Peak on unnamed peak elev. 8603 ft. , T1N/R7W/S26/ <i>Note: E. side of Cucamonga Peak not surveyed, but contains other populations. SBNF.</i>	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*

- *SBD* = San Bernardino County
- *LA* = Los Angeles County

Threats

Occurrences are generally remote and not at substantial risk, but occurrences on limestone may be threatened by future mining. CNDDDB also reports threats to this plant from mining, hiking, overcollecting, camping, facility expansion and maintenance (Table Mountain). Most of the populations are small and geographically limited, which may increase their susceptibility to stochastic events (USDA Forest Service in cooperation with Rancho Santa Ana Botanic Garden 1996).

Based on poor post-fire response by *E. m. var corymbosoides*, fire may also be a threat to occurrences.

Conservation and Management Considerations

The primary strategy for the conservation of this species is to improve the knowledge of its distribution and to monitor and remedy impacts of trail use. Impacts at Table Mountain should be addressed at the Project (Special Use Permit) level. The following is a list of conservation practices that should be considered for *Eriogonum microthecum* var. *johnstonii*:

- Monitor trails where they transect occupied habitat and identify areas where off-trail foot traffic is impacting this species. Install protective measures where needed.
- Survey all new occurrences of *Eriogonum microthecum* var. *johnstonii* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Eriogonum microthecum* var. *johnstonii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Eriogonum microthecum* var. *johnstonii* in the national forests of southern California using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Eriogonum microthecum var. *johnstonii* is narrowly distributed and uncommon throughout its range. While some of the recorded occurrences are vulnerable to identified threats, others are remote and not vulnerable to impacts.

Based on this analysis, *Eriogonum microthecum* var. *johnstonii* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no

substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Eriogonum microthecum var. *johnstonii* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Eriogonum microthecum* var. *johnstonii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Eriogonum microthecum* var. *johnstonii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Eriogonum microthecum var.
corymbosoides**

**Eriogonum ovalifolium var.
vineum**

Eriogonum ovalifolium* var. *vineum

Eriogonum ovalifolium Nutt. var. *vineum* (Small) A. Nelson (Cushenbury buckwheat)

Management Status

Federal: Endangered; Critical Habitat designated December 24, 2002 (67 FR 78569).

California: None

Heritage Rank: G5T1; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

Critical Habitat (CH) for *Eriogonum ovalifolium* var. *vineum* was designated by the USFWS on December 24, 2002 (67 Federal Register 78569) (U.S. Fish and Wildlife Service 2002). In determining which areas to designate as CH the USFWS considers those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These features are termed Primary Constituent Elements (PCEs) and they are summarized in the final rule (U. S. Fish and Wildlife Service 2002).

General Distribution

Eriogonum ovalifolium var. *vineum* is limited in distribution to the belt of carbonate substrates on the north and northeast east slopes of the San Bernardino Mountains. The known distribution of *Eriogonum ovalifolium* var. *vineum* extends about 25 miles (40 km) (USDA Forest Service 2002b).

Distribution in the Planning Area

The majority of recorded occurrences of *Eriogonum ovalifolium* var. *vineum* occur on the San Bernardino National Forest. The remaining occurrences are adjacent to the San Bernardino National Forest (California Natural Diversity Database 2004). *Eriogonum ovalifolium* var. *vineum* occurs on North Peak of White Mountain at the western end of its range, along the north slope of the San Bernardino Mountains to Terrace Springs, south to Top Spring, and along Lone Valley to Tip Top Mountain and Rattlesnake Canyon. This taxon also occurs in the Bertha Ridge area, north Holcomb Valley, Jacoby Canyon, along Nelson Ridge, and at Heartbreak Ridge (USDA Forest Service 2002b, U.

S. Fish and Wildlife Service 1997).

Surveys by Barrows (1988) resulted in a slight range extension in the Rattlesnake Canyon drainage, and additional surveys by the San Bernardino National Forest revealed two new populations: one near Jacoby Springs and the other just north of Mineral Mountain. Tierra Madre Consultants found the westernmost known occurrence just west of White Mountain (Tierra Madre Consultants 1992, extending the known range of the plant west by 1 mile (1.6 km). Twelve additional populations within the known range of the plant were documented by the San Bernardino National Forest and Tierra Madre Consultants during focused survey efforts (California Natural Diversity Database 2004, Tierra Madre Consultants 1992).

Taxonomy and Natural History

Eriogonum ovalifolium var. *vineum* is a dicotyledon in the buckwheat family (Polygonaceae).

Eriogonum ovalifolium var. *vineum* is a perennial herb that blooms from May through June. There are five varieties of *E. ovalifolium*. All varieties can be distinguished on the basis of floral and leaf characters; only variety *vineum* occurs in the San Bernardino Mountains (Hickman 1993).

Monitoring after the Willow Fire indicated poor to no resilience following moderate to high intensity fire; observations after the Willow Fire (Dry Canyon) as well as observations after the Arrastre Creek fire and a fire at Forest Service Road 3N03A suggest good resilience following low-intensity fire (USDA Forest Service 2002a).

Eriogonum ovalifolium var. *vineum* has leaf blades that are generally 6-8 mm, round, and more or less unmarginated. The inflorescence is characterized by a 3-6 cm axis. The 2-5 involucre are 5-7 mm. The perianth is generally 2-3 mm and white to cream (Hickman 1993).

Habitat Description

Eriogonum ovalifolium var. *vineum* occurs on limestone and dolomite substrates in openings of Jeffrey pine/western juniper forest, single-leaf pinyon/western juniper forest, pinyon woodland, pinyon-juniper woodland, Joshua tree woodland, and blackbush scrub communities at elevations of 4,600-7,900 feet (1,400-2,400 m). Populations occur in open areas with little accumulation of organic material, vegetation canopy cover generally under 15%, and powdery fine soils with rock cover exceeding 50%. The plants typically occur on moderate slopes, although a few occurrences are on slopes greater than 60%. On gentler, north-facing slopes, it occurs with the Federally Endangered Cushenbury milkvetch (*Astragalus albens*) (USDA Forest Service 2000). *Eriogonum ovalifolium* var. *vineum* is also associated with *Acanthoscyphus parishii* var. *goodmaniana* (Federally Endangered), *Pinus monophylla*, *Erigeron parishii* (Federally Threatened), *Arabis shockleyi*, *Yucca* spp., and *Juniperus californica*.

Carbonate habitats are characterized by naturally low vegetation productivity and open structure. As a result, carbonate habitats are not well suited for livestock grazing or timber and fuels management

activities. However, there is prolonged recovery time required following disturbance on carbonate soils; the effects of such activities where they have occurred can persist long after the action is completed (USDA Forest Service 2003).

Large-scale mining activities have led to an overall decline in the quantity and quality of carbonate habitat in the San Bernardino Mountains. Carbonate deposits in these mountains contain one of only three large high-purity white calcite deposits in the western United States. As a result, the deposits in the San Bernardino Mountains have been and continue to be extensively mined for commercial use. Most carbonate habitats on National Forest System lands are under mining claims that may become active in the future.

Ongoing mining operations indirectly affect carbonate habitats through dust, changes to surface hydrology, soil erosion, and the resulting increase in non-native plant abundance. Non-native plant species can competitively exclude native plants. Cheat grass, the most widespread weed in the San Bernardino Mountains, has the ability to alter natural fire disturbance regimes by carrying fire into areas that would otherwise not ordinarily burn because of low/sparse fuel loads (U.S. Fish and Wildlife Service 2001).

Approximately 16 miles of National Forest System roads cross or are adjacent to occupied carbonate plant habitat on the San Bernardino National Forest. Vehicle use off classified roads, dispersed uses around developed facilities, and special-use permit activities have adversely affected some *Eriogonum ovalifolium* var. *vineum* habitat.

Occurrence Status

The Carbonate Habitat Management Strategy and associated GIS includes detailed descriptions of occupied and suitable habitat distribution for this species.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences. (Refer to the Carbonate Habitat Management Strategy and associated GIS data for more thorough and precise occurrence distribution and mapping).

OCCURRENCE DATA – *Eriogonum ovalifolium* var. *vineum* (Cushenbury buckwheat)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1	< 50 in 1988; 200 in 2001	2001	<p>Pluess-Staufer Grade below the summit quarries, ca. 5 air mi. N of Big Bear Lake, San Bernardino Mountains. Plants scattered on available limestone habitat. w/ <i>Cercocarpus ledifolius</i>, <i>Quercus chrysolepis</i>, <i>Eriogonum saxatile</i>, <i>Stipa speciosa</i>, <i>Coleogyne ramosissima</i>, <i>Pinus monophylla</i>. Small island of undisturbed land at road switchback. On steep NW-facing slopes. Limestone mining = threat. Pluess-Staufer population comprising 1.5 acres continues to decline since 1979 due to mining. Occurrence in poor condition acc. to Barrows. SBNF.</p>	SBD
2	U	1979	<p>Just W of the JCT of Furnace and Wild Rose canyons, ca. 5.5 air mi. N of Big Bear Lake, San Bernardino Mtns. Plants scattered w/in available limestone habitat. Associated w/ <i>Arabis shockleyi</i>. Potential habitat extends eastward to Arctic Canyon. Pfizer population comprised of 4 acres. Population continues to decline since 1979 due to limestone mining. SBNF/PVT.</p>	SBD

3	> 2000 in 1988	1992	<p>From Whisky Springs N to Monarch Flat, and from Blackhawk Mountain W to Mohawk Mine, San Bernardino Mtns. Found on steep limestone slopes w/ <i>Pinus monophylla</i>, <i>Juniperus californica</i>. <i>Astragalus albens</i> and <i>Erigeron parishii</i> also nearby. Some areas have high density of EROVV. Several populations. Some in Blackhawk Mtn. area and W to Cushenbury Canyon. Other populations between Marble Canyon and E to Mohawk Mine. Limestone mining could threaten occ. Includes former occ. 15. SBNF/PVT.</p>	SBD
4	75 in 1995	1995	<p>Along ridge N of Holcomb Valley and W of Upper Holcomb Valley, San Bernardino Mtns. ca. 0.15-0.45 mi. N of FR 3N82 at spur road 'A'. Adjacent to inactive limestone quarry. Pinyon-juniper woodland w/ <i>Chrysothamnus nauseosus</i>, <i>Achnatherum hymenoides</i>, <i>A. coronatum</i>, <i>Arenaria macradenia</i>, <i>Cercocarpus ledifolius</i>, <i>Ephedra viridis</i>, <i>Cryptantha</i>. Gravelly to rocky soil derived from carbonate bedrock. Three small colonies reported in 1979. <i>Arabis shockleyi</i>, <i>Oxytheca parishii</i> var. <i>goodmaniana</i> also present. SBNF.</p>	SBD

6	'several hundred'	1992	Terrace Springs, ca. 4 air mi. NE of Baldwin Lake, San Bernardino Mtns. Found on limestone slopes w/ <i>Pinus monophylla</i> , <i>Yucca</i> spp., <i>Astragalus albens</i> , <i>Erigeron parishii</i> . Also found on ridge SW of Grapevine Canyon. What is remaining is in good to fair condition. Most slopes have been quarried and more in progress. Much of area is proposed for quarrying. SBNF/PVT.	SBD
7	800 in 1988; 1000 in 1991 at NW colony	1992	Helendale Fault area from Squirrel Spring area SE to Tip Top Mountain, San Bernardino Mtns. Area under inactive mineral claims, but test holes were drilled in 1991. Found on limestone soil and rock. Associated w/ <i>Pinus monophylla</i> , <i>Juniperus californica</i> , <i>Chrysothamnus nauseosus</i> . Also w/ <i>Astragalus albens</i> , <i>Arabis shockleyi</i> , <i>Erigeron parishii</i> . Population consists of several colonies scattered along FR 3N03. ORV activity, trash, roads = threats. SBNF/PVT.	SBD
8	< 150 in southern colony in 1998; < 25 in northern colony in 1992.	1992	S of Rose Mine along FR 2N02 at the head of Rattlesnake Canyon, San Bernardino Mtns. Roads through occ. provide ORV access. Quarries also in area. Found on limestone in powdery soil. Associated w/ <i>Pinus monophylla</i> , <i>Coleogyne ramosissima</i> . Mapped as two colonies. Southern colony rated as fair to good; northern colony rated as excellent. SBNF.	SBD

9	> 500 in 1992	1992	Ridge E of Top Spring ca. 2 air mi. NE of Baldwin Lake, San Bernardino Mtns. road through occ. gets heavy use and trash. Shooting and camping occur. History of mining in area. Plants found on limestone ridges associated w/ <i>Pinus monophylla</i> , <i>Juniperus californica</i> , <i>Yucca</i> spp. <i>Astragalus albens</i> and <i>Erigeron parishii</i> occur nearby. Found mostly above road. SBNF.	SBD
10	250-500 in 1988 over 8-10 acres	1988	NE slope of White Mountain, ca. 1 air mi. E of N Peak, San Bernardino Mtns. Along road S of White Knob in canyon and on slopes. Some plants found on road shoulder. Found on slopes in canyon and ridges on limestone. Assoc. w/ <i>Pinus monophylla</i> , <i>Juniperus californica</i> , <i>Arctostaphylos</i> . <i>Erigeron parishii</i> and <i>Arabis shockleyi</i> also present. Roads through occ. and area scheduled to be quarried in 1989. Occurrence probably destroyed. SBNF.	SBD
11	> 800 in 1988	1988	Ca. 4.5 mi. E of Fawnskin and immediately N of Hwy 38, San Bernardino Mtns. Occurrence adjacent to development w/ evidence of shooting, woodcutting, and roads. Some ORV damage has occurred. Found on limestone marble, grey dolomitic limestone, and exposed white bedrock. Assoc. w/ <i>Pinus monophylla</i> , <i>Fremontodendron</i> sp., and <i>Lesquerella kingii</i>	SBD

			<i>bernardina</i> . Another population is just N of E end of Lake. SBNF.	
12	60 in 4 southern colonies in 1988; 10 in NE colony in 1992; 15 in new colony to the N in 1994	1994	N of Rattlesnake Canyon, SE end of Mineral Mountain, San Bernardino Mtns. Occurs adjacent to roads. Plants found on powdery limestone soils w/ scattered <i>Pinus monophylla</i> , <i>Arctostaphylos glauca</i> , <i>Yucca brevifolia</i> , <i>Cercocarpus ledifolius</i> , <i>Chrysothamnus nauseosus</i> , <i>Ceanothus greggii</i> , <i>Ephedra viridis</i> , <i>Salvia pachyphylla</i> , <i>Stipa coronata</i> . <i>Oxytheca parishii goodmaniana</i> and <i>Arabis shockleyi</i> also occur. Area is under mining claim; mining roads currently used by ORVs. SBNF.	SBD
13	U	1988	East of Rattlesnake Canyon, ca. 1.5 air mi. WNW of Bain Ranch, NE of Heartbreak Ridge, San Bernardino Mtns. Found on powdery soils in a very open site. Assoc. w/ <i>Arctostaphylos glauca</i> , <i>Pinus monophylla</i> , <i>Yucca brevifolia</i> . <i>Arabis shockleyi</i> also present. Plants very scattered in 2 colonies. Old mine sites and an abandoned quarry. SBNF.	SBD

14	250 in 1988	1988	N slope of Heartbreak Ridge, ca. 0.75 air mi. SE of Broom Spring, San Bernardino Mtns. Access road heavily used by ORVs, but this is not impacting occurrence. Found on calcareous soil. Assoc. w/ <i>Pinus monophylla</i> , <i>Cercocarpus ledifolius</i> , <i>Juniperus californica</i> . Excellent site quality (not disturbed.) SBNF.	SBD
15	50 in eastern colony in 1987; 150 in western colonies in 1988	1988	Between Arctic Canyon and Marble Canyon on W side of Marble Canyon, N slope San Bernardino Mtns. Found in drainage of calcareous soil w/ <i>Pinus monophylla</i> , <i>Juniperus californica</i> , <i>Ephedra viridis</i> , <i>Arctostaphylos glauca</i> , <i>Yucca schidigera</i> , <i>Coleogyne ramosissima</i> . <i>Erigeron parishii</i> and <i>Astragalus albens</i> in drainage nearby. Plants are very scattered on slopes above Marble Canyon pit. Area scheduled for mining ca. 1987-1992. SBNF/PVT.	SBD
16	> 200 estimated in 1988	1988	W slope of Furnace Canyon, near canyon mouth, San Bernardino Mtns. Adjacent to abandoned quarry and access road. Area is used for access to springs, dump piles, etc. Found on limestone soil associated with <i>Arctostaphylos glauca</i> , <i>Yucca brevifolia</i> , <i>Pinus monophylla</i> . <i>Erigeron parishii</i> and <i>Astragalus albens</i> nearby. Currently this population is not very disturbed. PVT.	SBD

17	U	U	Between Arrastre Canyon and Grapevine Canyon, ca. 1 air mi. NW of Rattlesnake Mountain, San Bernardino Mtns. Land owner: U.	SBD
19	0 in 1988	1988	NE of Upper Holcomb Valley and ca. 1 air mi. N of Holcomb Valley, San Bernardino Mtns. Area undisturbed, but ORV roads and old quarries are in area. Carbonate (predominantly dolomite) outcrop. Plants mapped here in 1979. SBNF.	SBD
20	< 150 in 1988	1988	E of Rose Mine, N end of Round Valley, San Bernardino Mtns. One limestone rock. Associated w/ <i>Pinus monophylla</i> , <i>Coleogyne ramosissima</i> , <i>Yucca brevifolia</i> . Area popular for ORVs and shooting. Several exploratory mines in area. SBNF.	SBD
21	< 150 in 1988	1988	N of Rattlesnake Canyon and S of Mineral Mountain, N slope San Bernardino Mtns. Found scattered on limestone rock and powdery soil. w/ <i>Pinus monophylla</i> , <i>Coleogyne ramosissima</i> , <i>Yucca brevifolia</i> . Area popular for ORVs and shooting. SBNF.	SBD

23	U	1988	<p>E of Marble Canyon and about 1 air mi. SW of Cushenbury, San Bernardino Mtns. On steep rocky limestone slope in a small drainage. Assoc. w/ <i>Pinus monophylla</i>, <i>Arctostaphylos glauca</i>, <i>Purshia glandulosa</i>, <i>Salvia pachyphylla</i>, <i>Yucca brevifolia</i>, <i>Erigeron parishii</i>. Occurrence in good shape/ undisturbed in 1988. Mining and roads = threats. PVT-probably owned by Cushenbury Trust (formerly Kaiser Steep Co.).</p>	SBD
24	ca. 300 in 1992	1992	<p>NW slope of Nelson Ridge, near Jacoby Spring, San Bernardino Mtns. Ca. 1 mi. W of Hwy 18 on FR 3N61. Growing in gravelly openings w/in pinyon-juniper woodland on carbonate soils. w/ <i>Stipa coronata</i>, <i>Cryptantha confertiflora</i>, <i>Fremontodendron californicum</i>, <i>Cercocarpus ledifolius</i>, <i>Eriogonum microthecum corymbosoides</i>. <i>Arabis shockleyi</i> and <i>Pholisma arenarium</i> also present. Most carbonaceous soils in region are under mining claim. Site is along proposed ORV trail. SBNF.</p>	SBD
25	'numerous' in eastern colony in 1992; 67 in 3 western colonies in 1996	1996	<p>East slope of White Mountain, ca. 1.5 mi. E of North Peak, San Bernardino Mtns. Growing on limestone talus or colluvial soil overlaying granitic bedrock. More ecological info. needed for this site. SBNF.</p>	SBD

26	182 on E-facing slopes, 56 on W-facing slopes in 1992; 75 on W slope in 1996; 62 on W slope in 2001	2001	White Mountain, just N of North Peak, San Bernardino Mountains. <i>Pinus monophylla</i> - <i>Cercocarpus ledifolius</i> community w/ <i>Ephedra viridis</i> , <i>Chrysothamnus</i> , <i>Eriodictyon trichocalyx</i> , <i>Haplopappus linearifolius</i> , <i>Purshia glandulosa</i> , <i>Stipa pinetorum</i> . Soil derived from carbonate bedrock. Two colonies; along E and W-facing slopes of the summit just N of North Peak. Partially burned in 1999, but most of site not affected. Within mineral claim for carbonate rock, adjacent to gold quarry. SBNF.	SBD
27	< 25 in 1992	1992	North of Mineral Mountain and W of Blue Cut, San Bernardino Mtns. Mapped 0.4 km (0.25 mi.) W of Blue Cut. ca. 700m (0.5 mi.) E of the end of FR 2N90B. w/in pinyon-juniper woodland on carbonaceous ridgeline. Dominant shrubs are <i>Cercocarpus ledifolius</i> , <i>Chrysothamnus viscidiflorus</i> ssp. <i>stenophilus</i> , <i>Gutierrezia microcephala</i> . Other spp. include <i>Stipa coronata</i> , <i>Aristida</i> , <i>Echinocereus</i> . Area is under mining claim for carbonaceous substrate. Needs additional fieldwork. SBNF.	SBD

29	8 in 1992	1992	North of Upper Holcomb Valley, San Bernardino Mountains. Within an opening in <i>Pinus monophylla</i> . Substrate is dolomite. Site is just NE of 'John' benchmark on the topo map. SBNF.	SBD
30	'numerous'	1992	Wildrose Canyon, just northwest of spring at head of canyon, San Bernardino Mountains. Growing on undisturbed dolomitic hillside. <i>Erigeron parishii</i> growing nearby on roadcut. Additional ecological information needed for this site. SBNF.	SBD
31	30 in 1993	1993	Northeast slope of Mineral Mountain ca. 0.3 mi. ENE of Blue Cut, San Bernardino Mountains. Ca. 0.25 mi. NW of old homestead near end of Mound Spring Road off FR 2N91 (Viscera Springs Rd). Pinyon-juniper woodland on soils derived from carbonate rock. Associated w/ <i>Cercocarpus ledifolius</i> , <i>Chrysothamnus viscidiflorus</i> , <i>Ceanothus greggii</i> , <i>Ephedra viridis</i> , <i>Salvia pachyphylla</i> , <i>Stipa coronata</i> , <i>Cryptantha confertiflora</i> . <i>Arabis shockleyi</i> also present. Entire area is under mining claim. SBNF.	SBD

32	U	1996	<p>Ridgetop east of Marble Canyon and NW of Burnt Flat, San Bernardino Mountains. Ridgeline above Mitsubishi mining operation. Plants seen on N and S aspects between the 6005' and 6403' ridgetops. Pinyon-Utah juniper woodland w/ <i>Prunus fasciculatum</i>, <i>Arctostaphylos glauca</i>, <i>Chrysothamnus viscidiflorus</i>, <i>Achnatherum coronatum</i>, <i>Aristida purpurea</i>. <i>Arabis shockleyi</i> and <i>Oxytheca parishii goodmaniana</i> also present. White limestone derived soils. Not disturbed, but entire area is under mining claim. SBNF.</p>	SBD
33	350 in 1995	1995	<p>North slope of Blackhawk Mountain ca. 1.4 mi. NW of Silver Peak, San Bernardino Mtns. Accessed from FR 3N36 through Monarch Flat, then NW along unmarked mining road. Site is mapped along E slope of canyon. Pinyon-juniper woodland w/ <i>Coleogyne ramosissima</i>, <i>Ephedra viridis</i>, <i>Achnatherum coronatus</i>, <i>Achnatherum speciosum</i>. Carbonate soils derived from bedrock, talus, and alluvium. <i>Erigeron parishii</i>, <i>Astragalus albens</i>, <i>Oxytheca parishii goodmaniana</i> also found nearby. BLM-Barstow RA.</p>	SBD

34	U	1996	East side of Arctic Canyon near mouth, San Bernardino Mountains. Pinyon woodland with <i>Cercocarpus ledifolius</i> and <i>Arctostaphylos glauca</i> . Soils derived from carbonate rock. Two colonies at base of mountain slope above alluvial fan. Site approved for limestone quarry. PVT.	SBD
35	U	1996	Upper Furnace Canyon, ca. 0.7 mi. up from confluence w/ Wildrose Canyon, N slope San Bernardino Mountains. Pinyon woodland w/ <i>Cercocarpus ledifolius</i> . Generally on talus or limestone outcrops; rare in wash bottom. Mapped in upper portion of canyon from 6000-6600'. Land owner: U.	SBD
36	17 in 1994	1994	White Mountain, along ridge ca. 0.5 mi. NNW of South Peak, San Bernardino Mtns. Mapped just W of spur road 450 m SW of White Mountain 7727' benchmark. Pinyon-juniper woodland w/ <i>Cercocarpus ledifolius</i> , <i>Chrysothamnus viscidiflorus</i> , <i>Ephedra viridis</i> , <i>Eriogonum microthecum</i> , <i>Poa fendleri</i> , <i>Caulanthus major</i> , <i>Galium parishii</i> . Soils derived from carbonate bedrock. <i>Oxytheca parishii goodmaniana</i> and <i>Arabis shockleyi</i> also found here. Entire area under mining claim. SBNF.	SBD

37	U	1994	<p>North slope of Blackhawk Mountain, ca. 0.5 mi. NW of Silver Peak, San Bernardino Mountains. Mapped on NE-facing slope. Pinyon-juniper woodland in carbonate soils. Associated w/ <i>Yucca brevifolia</i>, <i>Cercocarpus ledifolius</i>, <i>Coleogyne ramosissima</i>, <i>Arctostaphylos glauca</i>, <i>Chrysothamnus viscidiflorus</i>, <i>Achnatherum coronatum</i>. Observed w/ <i>Arabis shockleyi</i>. Area is under mineral claim. Spoil from nearby road threatens plants. SBNF.</p>	SBD
621920 (RSA)	U	1998	<p>North base of Blackhawk Mountain, southwest of Round Mountain, just west of mouth of Grapevine Canyon, near area of intensive mining. Near 34 ° 20' 28'' N 116 ° 46' 49'' W. T3N R2E SE 1/4 SE 1/4 SW 1/4 sec. 16. (Boyd)</p>	SBD
615284 (RSA)	U	1998	<p>Knoll southeast of Top Spring, northwest of Smarts Ranch and west of Horsethief Flats. Near 34 ° 19' 09.4'' N 116 ° 47' 11.6'' W. T3N R2E near border of sec. 28 & 29. (Boyd)</p>	SBD
616163 (RSA)	U	1998	<p>North of Road 3N36, northeast of Monarch Flat, east of peak '5348'. Near 34 ° 21'05'' N 116 ° 49'37'' W. T3 N R1 E Se 1/4 sec. 12. Elev. 5200 Feet. (Soza)</p>	SBD

343159 (RSA)	U	1979	Along Hwy 3N03, ca. 3 air miles E of Baldwin Lake; elev. 6000 feet. (Thorne)	SBD
479892 (RSA)	U	1988	Above Silver Creek, White Ridge; above Lucerne Valley. (Wisura)	SBD
197010 (RSA)	U	1966	California 18, 33 miles southeast of the Victorville. T. 3 N., R. 1 E., Sec. 2 Elev. 5000 ft. (Holmgren)	SBD
334615 (RSA)	U	1978	Cushenbury Canyon: Limestone crags and talus slopes, 0.1 mile within SBNF elev. (Thorne)	SBD
479889 (RSA)	U	U	Round Valley, off FS rd, 2NO2 off Hwy. 18. (Thorne)	SBD
393040 (RSA)	U	1978	Hwy 18, 8.7 mi SE of Lucerne Valley, 0.1 mi inside SBNF. 4500 ft. elev. NE side of the road. Pinyon -juniper woodland. Limestone talus up a small draw on NE side of the road. (Davidson)	SBD
805161 (CalFlora 2005)	U	1989	SW slope Blackhawk Mtn, T3N R2E S19 NW quarter, 6300 ft, open scrub on limestone scree with Yucca, Juniperus, Cercocarpus intricatus (Taylor)	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

On National Forest System lands, *Eriogonum ovalifolium* var. *vineum* is threatened by mining activities, mineral exploration, road and power line construction, utility corridors, vehicle use off classified roads, and grazing outside of designated areas. While the majority of this species habitat is under mining claim, implementation of the Carbonate Habitat Management Strategy will provide habitat reserves protected from mining sufficient to provide for long-term viability.

Threats on private land are limited to mining activities on the north slope. The long-term protection of this species has been ensured through the Carbonate Habitat Management Strategy (CHMS), which was completed in 2003 and developed collaboratively by a diverse group of affected parties. Implementation of this strategy will provide for the recovery of four threatened and endangered carbonate endemic plant species while also providing for continued economically important limestone mining. The CHMS defines a set of land management categories ranging from expected and current mining to Carbonate Habitat Reserves that will be managed for the conservation of the listed plants and habitat. Collaborating parties signed a Memorandum of Understanding (MOU), committing the SBNF to administer the strategy as future mining projects proceed and the habitat reserve is assembled (USDA Forest Service 2003).

Conservation and Management Considerations

The primary conservation strategy for *Eriogonum ovalifolium* var. *vineum* is to implement the Carbonate Habitat Management Strategy and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Implement the Carbonate Habitat Management Strategy.
- Utilize the habitat suitability criteria and detection protocol developed for this taxon and apply to surveys at the project level. This will help to ensure that future projects and management actions with effects to this taxon will trigger the appropriate standards, even where occurrences are currently not known.
- Survey all new occurrences of *Eriogonum ovalifolium* var. *vineum* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Eriogonum ovalifolium* var. *vineum* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Eriogonum ovalifolium* var. *vineum* on NFS lands using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas and the CHMS Habitat Inventory.

Evaluation of Current Situation and Risks on National Forest System Lands

Eriogonum ovalifolium var. *vineum* is a locally-common narrow endemic species known only to occur in the north-eastern San Bernardino Mountains, and entirely on carbonate. Some of these carbonate

habitat areas are protected from identified threats, although most others are not well protected. Based on the above analysis, *Eriogonum ovalifolium* var. *vineum* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	B	C	B

Eriogonum ovalifolium var. *vineum* is listed under the federal Endangered Species Act as endangered, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

The viability of this species is tied tightly to protection and management of carbonate habitat. Existing protections afforded this species and its critical habitat under the Endangered Species Act provide considerable baseline protection. With full implementation of the CHMS, viability for this species on NFS lands is secure.

The CHMS will provide protection and management with regard to mining activities under all alternatives, but with greater effectiveness under Alternatives 2 through 6. Under the CHMS, mining will continue to result in the majority of impacts to this species and its habitat. As an important core habitat reserve under the CHMS, the Blackhawk recommended RNA, which supports 196 acres of occupied habitat for this species, is essential for a favorable viability outcome.

Under Alternatives 1, 4 and 5, protections for this species related to Land Use Zones would be limited to the existing Bighorn Mountains Wilderness. Under Alternatives 2, 3, 4a and 6, designation of the recommended Blackhawk RNA would provide essential protection, and would become a core habitat reserve under the CHMS. Under Alternatives 3, 4a and 6, additional areas of designated Back Country Non-motorized zoning would provide a modest increase in protection for this species. Under Alternatives 2, 3, 4, 4a and 6, the Bertha CBZ would provide important protection where this species occurs disjunct from the main carbonate belt. Under Alternatives 3 and 4a, the Heartbreak Ridge recommended wilderness would provide protection for the disjunct occurrence of *Eriogonum ovalifolium* var. *vineum* at Heartbreak Ridge. The alternatives would provide varying protection from unauthorized off-road driving, however, because of habitat terrain, this is not expected to be a

substantial impact for this species.

Consideration of the Standards related to roads and recreation factor into these outcomes. The proposed Blackhawk RNA, where applied, is critical to these outcomes. Presumed implementation of the CHMS is fundamental to the outcomes.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	B	C	B

The private lands, mainly patented claims along the base of the north slope of the San Bernardino Mountains, are a major portion of this species' distribution and have been reduced by large-scale limestone mining. The habitat surrounding these mines continues to be lost as quarries are expanded. This loss on private lands is expected to be guided in the future by the CHMS and thus not expected to reduce the viability of the protected and managed occurrences on the SBNF. Habitat on BLM lands to the north of the SBNF will also be managed under the CHMS, so that all of this species' habitat will be managed under a single strategy across jurisdictional boundaries.

By maintaining the current distribution of *Eriogonum ovalifolium* var. *vineum* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Eriogonum ovalifolium* var. *vineum* to suffer a decline in its overall distribution.

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**Eriogonum microthecum var.
johnstonii**

**Eriogonum umbellatum var.
minus**

Eriogonum umbellatum var. minus

Eriogonum umbellatum Torrey var. *minus* I.M. Johnston (Alpine sulfur-flowered buckwheat)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G5T3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Eriogonum umbellatum var. *minus* is mainly distributed in the San Gabriel Mountains of Los Angeles and San Bernardino counties, but also occurs in the San Bernardino Mountains of San Bernardino County. A historical occurrence has been documented from the Panamint Mountains in Inyo County, although this record is dubious, as the taxon has not been recently documented in the area (York pers. comm.) .

Seven of the 19 known occurrences are in Los Angeles County, and locations include Mount San Antonio, Dawson Saddle, Mt. Williamson, and Mt. Burnham (Calflora 2002). The four occurrences from San Bernardino County are found on Mount San Antonio and Cucamonga Peak in the San Gabriel Mountains and disjunct at Sentinel Quarry on the north slope of the San Bernardino Mountains. There is one historical record from the San Jacinto Mountains of Riverside County from 1915, but this occurrence is dubious and unconfirmed.

Distribution in the Planning Area

This species is probably endemic to the Angeles and San Bernardino National Forests, and there are no known occurrences off NFS land. Ten of the 19 records of *Eriogonum umbellatum* var. *minus* occur within the planning area on the Angeles (ANF) and San Bernardino (SBNF) national forests. Seven records from Mount San Antonio are within the Sheep Mountain Wilderness of the Angeles National Forest, and the remaining seven records from the ANF include locations at Dawson Saddle, the east slope of North Baldy, Mt. Williamson, and Mt. Burnham. One of the two occurrences on the SBNF is

within the Cucamonga Wilderness on Cucamonga Peak, and the other SBNF record was recently found in Sentinel Quarry on the north slope of the San Bernardino Mountains (Calflora 2002, USDA Forest Service 2002).

Taxonomy and Natural History

Eriogonum umbellatum var. *minus* is a perennial herb in the buckwheat family (*Polygonaceae*). Plants form loose or dense prostrate mats mostly 0.5-2 dm across. Leaves are mostly round-ovate, 0.3-0.8 (1) cm long, 0.3-0.8 cm wide, and are densely white-lanate on both surfaces. Flowering stems are spreading to erect, mostly 0.2-0.8 (1.5) cm long, and densely tomentose. Inflorescences are capitate to subcapitate or umbellate, up to 2.5cm long, with branches densely tomentose. The involucre has tubes that are 1.5-2 mm long, with tomentose lobes 1.5-2 mm long. Flowers are lemon-yellow to yellowish-red, becoming red to a deep rose-red and are (2.5) 4-6 mm long. Flowers are generally conspicuously striped. (Hickman 1993; Reveal 1989). Flowering occurs between July and September (Munz 1974).

Habitat Description

Eriogonum umbellatum var. *minus* inhabits dry, sandy, or stony soils within upper montane and subalpine conifer forest habitats between 6,000 and 10,064 feet elevation (Hickman 1993). Suitable habitat for this taxon is present throughout the higher elevations of the San Gabriel Mountains in the general vicinity of Mount San Antonio east to Cucamonga Peak. Suitable habitat on the ANF is threatened by possible ski area expansion, dispersed recreation, and trail construction and maintenance. Habitat on the north slope of the San Bernardino Mountains is threatened by mineral extraction activities and effects from dispersed recreation on SBNF lands.

Occurrence Status

The primary distribution of this species in the eastern San Gabriel high country is relatively inaccessible, with relatively minor threats. While population status and trends are not known, all of these occurrences are presumed extant. Records from the Panamint and San Jacinto Mountains are probably erroneous, and the odd disjunct record from Sentinel Quarry is threatened and expected to be lost to an approved quarry expansion.

The table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Eriogonum umbellatum* var. *minus* (Alpine sulfur-flowered buckwheat)

Occurrence ID No. (CalFlora 2002)	No. of Plants	Year Reported	Location/Land Owner	County

1312238	U	1957	Summit of Mt. San Antonio near San Gabriel Mountains, Mt. San Antonio. ANF-Sheep Mountain Wilderness	SBD
1321660	U	1966	NW slope of Cucamonga Peak, Cucamonga Wild Area San Gabriel Mts. SBNF-Cucamonga Wilderness	SBD
1220427, 1331701, 1819492, 1323330	U	1918, 1902, 1937, 1971	"Baldy"/Mt. San Antonio; Old Baldy along trail from Baldy Notch to San Gabriel Mountains. ANF-Sheep Mountain Wilderness	SBD
*	U	2000	Sentinel Quarry, San Bernardino Mountains. SBNF (disjunct)	SBD
1821191, 1383285	U	1939,	San Gabriel Mountains: Crest of San Antonio above Mankers Flat. ANF-Sheep Mountain Wilderness	LA
1323446, 1188261	U	1969, 1958	Dawson Saddle; Dawson Saddle just w; just s of Mt. Lewis along Angeles Crest Highway (State Highway 2), above headwaters of South Fork of Big Rock Creek, San Gabriel Mountains. ANF	LA
1415401, 1220470	U	1934	E slope North Baldy, San Gabriel Mountains. ANF	LA
1415365	U	1934	About summit Mount Williamson, San Gabriel Mountains. ANF	LA
1819491	U	1937	San Antonio Mt., San Gabriel Mountains. ANF-Sheep Mountain Wilderness	LA

1323462	U	1971	Summit of Mt. Burnham, San Gabriel Mountains. ANF	LA
1821192	U	1931	Panamint Mountains, Mt. Baldy to Telescope Peak. U – NPS-Death Valley National Park? - DUBIOUS/UNCONFIRMED	Inyo
*	U	1915	San Jacinto Mountains – DUBIOUS/UNCONFIRMED.	RIV

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*
- *RIV = Riverside County*

Threats

Some of the Mt San Antonio occurrences of *Eriogonum umbellatum* var. *minus* on the ANF are threatened by expansion of the Mt. Baldy Ski Area and by potential effects from recreational use and trail construction and maintenance (USDA Forest Service 2002). The occurrence on Cucamonga Peak on the SBNF may be threatened by trampling from equestrian and hiker use. The occurrence of *Eriogonum umbellatum* var. *minus* on the north slope of the San Bernardino Mountains is expected to be lost to an approved mine expansion (USDA Forest Service 2002).

Conservation and Management Considerations

The primary strategy for the conservation of this species is to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for *Eriogonum umbellatum* var. *minus*:

- Survey all new occurrences of *Eriogonum umbellatum* var. *minus* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Salvage individuals and/or seed from the Sentinel Quarry occurrence prior to mine expansion. Propagate and introduce to a nearby suitable site.
- Collect a herbarium voucher specimen of *Eriogonum umbellatum* var. *minus* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.

- Map known and new occurrences of *Eriogonum umbellatum* var. *minus* in the planning area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Eriogonum umbellatum var. *minus* is narrowly distributed and uncommon throughout its range. While some of the recorded occurrences are vulnerable to identified threats, others are remote and not vulnerable to impacts.

Based on this analysis, *Eriogonum umbellatum* var. *minus* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Eriogonum umbellatum var. *minus* is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Eriogonum umbellatum* var. *minus* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Eriogonum umbellatum* var. *minus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Eriogonum umbellatum* var. *minus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Eriogonum ovalifolium var.
vineum**

Eriophyllum lanatum var. hallii

Eriophyllum lanatum var. hallii

Eriophyllum lanatum (Pursh) Forbes var. *hallii* Const. (Fort Teton woolly sunflower)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G5T1, S1.1 – very threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Eriophyllum lanatum var. *hallii* is known from two locations on the eastern edge of the San Emigdio Mountains near Fort Tejon, Kern County and from two locations in the Sierra Madre Mountains of Santa Barbara County (California Natural Diversity Database 2004).

Distribution in the Planning Area

The two occurrences located in the Sierra Madre Mountains are on National Forest System land on the Mount Pinos Ranger District of the Los Padres National Forest. The only other known locations are on private land in Johnson Canyon near Fort Tejon, Kern County.

Taxonomy and Natural History

This member of the sunflower family is an erect perennial (subshrub), 12-16 inches (3-4 dm) tall, with numerous stems. The leaves are 1-2 inches (2.5-5 cm) long, thin to broad, and pinnately divided. The flower heads are solitary or few and are composed of ray (8-9) and disk flowers. The ray flower ligules are 0.4-0.5 inches (10-13 mm) long and the disk flower corollas are 0.16-0.2 inches (4-5 mm) long with a glabrous tube. The flower heads usually bloom from June to July.

Field observations have shown that predation of its seeds by the larvae of the Tephritidae fruit fly may be limiting reproductive output.

Habitat Description

Fort Tejon woolly sunflower grows on rocky soils in chaparral and foothill woodland at elevations between 3,900-4,900 feet (1,200-1,500 m). The location above Lion Canyon on Sierra Madre Ridge is a north-facing slope vegetated with *Quercus john-tuckeri*, *Garrya flavescens*, *Osmorhiza brachypoda*, and *Malacothrix saxatilis* var. *tenuifolia*. The second site on Sierra Madre Ridge is just northwest of Montgomery Potrero and is also on a north-facing, brush-covered slope. Here, the associates are *Quercus john-tuckeri*, *Chrysothamnus nauseosus*, *Lupinus albifrons*, *Rhamnus californica*, and *Garrya flavescens*.

Occurrence Status

Populations of *Eriophyllum lanatum* var. *hallii* on National Forest System (NFS) land appear stable. The number of plants found at the Lion Canyon occurrence has been recorded several times and these counts indicate a slight upward trend in abundance (750 plants in 1981, 824 plants in 1993, and 850 plants in 1994). The number of plants found at the Montgomery Peak/Potrero occurrence was reported to be 12 in 1993 and 37 in 1994. Obtaining accurate counts is complicated by the clumpiness of the plants and the steep, moderately dense slopes that the plants occur on. The counting of plants can cause harm to habitat for *Eriophyllum lanatum* var. *hallii* as a result of foot traffic producing small slides. Small plants can be harmed or killed by census taking. In 2003, monitoring visits were made to both sites and though no counts were conducted it appeared that both plants and habitat were in good condition with no apparent changes in distribution and density.

On private land, there is no recent census data for Occurrence #2 found in Johnson Canyon. For Occurrence #3 located east of Johnson Canyon, 530 plants were reported present in 1987 and "hundreds" of plants were observed here in 1995.

Threats

On NFS land, livestock use in the Santa Barbara Potreros and Branch Canyon Allotments was determined to be a threat to *Eriophyllum lanatum* var. *hallii*. In the 1990s, a cattleguard was installed on Sierra Madre Ridge Road to prevent cattle from accessing an occurrence of *Eriophyllum lanatum* var. *hallii* located above Lion Canyon (CNDDDB Occurrence #1) and a livestock enclosure was built around the occurrence in Branch Canyon allotment to prevent cattle from accessing the Montgomery Peak occurrence of *Eriophyllum lanatum* var. *hallii* (CNDDDB Occurrence #4). Monitoring in 2003 (Foster) indicates that these structures are effective in keeping livestock out of occupied habitat.

Eriophyllum lanatum var. *hallii* habitat at both of the locations found on NFS land is in good condition though the presence of Sierra Madre Ridge Road below each population may result in indirect effects to habitat through deposition of dust and the maintenance of ruderal habitat on the road edges. Ruderal habitat can provide opportunities for non-native plants to become established. Once established, non-native plants can degrade habitat for *Eriophyllum lanatum* var. *hallii* if these non-native plants migrate

uphill and being to compete with *Eriophyllum lanatum* var. *hallii* for space, water, sunlight, and nutrients. Road use and maintenance is otherwise not currently affecting *Eriophyllum lanatum* var. *hallii* habitat.

Habitat at one location in Johnson Canyon near Fort Tejon is reported to be severely impacted by livestock grazing (CNDDDB Occurrence #2). Grazing and development could threaten a second occurrence located east of Johnson Canyon though the site is reported to be secure at this time due to the steepness of the terrain and a dense cover of shrubs (Moe 2002).

The two occurrences of *Eriophyllum lanatum* var. *hallii* found on NFS land are located about 50 air miles west of the two known occurrences located adjacent to Fort Tejon. Systematic surveys of the intervening lands have not been attempted though the Forest Service did use botanical consultants to survey potential habitat on Sierra Madre Ridge in 1994 (Munro 1994). The Forest Service has not developed a model of potential habitat for *Eriophyllum lanatum* var. *hallii*. It is not possible to predict the probability that additional occurrences of *Eriophyllum lanatum* var. *hallii* are present in this landscape.

Conservation and Management Considerations

Eriophyllum lanatum var. *hallii* is a narrow endemic that occurs in two general locations, one of which is located on NFS land and one that isn't. This taxon appears to be inherently rare and not naturally well distributed. Although habitat conditions on National Forest System lands were once degraded due to livestock grazing, management practices employed in the late 1990s have addressed this issue through the use physical barriers to preclude livestock access to occupied habitat. Thus, the two occurrences of *Eriophyllum lanatum* var. *hallii* are no longer at risk of being extirpated by actions carried out or permitted by the Forest Service nor are these occurrences currently affected by on-going activities.

Evaluation of Current Situation and Threats on National Forest System Lands

Eriophyllum lanatum var. *hallii* is very uncommon with a very limited distribution. The single known metapopulation of *Eriophyllum lanatum* var. *hallii* on National Forest System lands consists of about 900 plants on a total of less than 5 acres of land; however, both of the known locations found on National Forest System lands are currently protected from ongoing activities and this protection would continue under all alternatives.

Based upon the above analysis *Eriophyllum lanatum* var. *hallii* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Eriophyllum lanatum var. *hallii* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Eriophyllum lanatum* var. *hallii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Eriophyllum lanatum* var. *hallii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Eriogonum umbellatum var.
minus

Eriophyllum lanatum var.
obovatum

Eriophyllum lanatum var. obovatum

Eriophyllum lanatum (Pursh) James Forbes var. *obovatum* (E. Greene) H.M. Hall (Southern Sierra woolly sunflower)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G5T3; S4 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Eriophyllum lanatum var. *obovatum* is known primarily from the San Bernardino Mountains in San Bernardino County and the southern Sierra Nevada in Fresno, Kern, and Tulare counties (California Native Plant Society 2001, Mooring and Johnson 1993). Specimens have also been collected from northern California in Siskiyou County (CalFlora 2002).

Distribution in the Planning Area

In southern California, most of the known occurrences of *Eriophyllum lanatum* var. *obovatum* are on or adjacent to the San Bernardino National Forest. Many historical collections were made in the San Bernardino Mountains, including City Creek Road, the south side of Big Bear Lake, Fish Camp, and Bluff Lake (CalFlora 2002). Other occurrences on or near the San Bernardino National Forest include Running Springs, Green Valley, Rim of the World, and east of Fredalba (Krantz, et.al. draft 2000). Several occurrences were documented in the 1980s by herbarium specimens from the San Bernardino National Forest; however, collection of *Eriophyllum lanatum* var. *obovatum* voucher specimens has been less frequent in recent years (CalFlora 2002, USDA Forest Service 2002).

Taxonomy and Natural History

Eriophyllum lanatum var. *obovatum* is a dicotyledon in the sunflower family (Asteraceae). Although there are seven other varieties of *E. lanatum*, var. *obovatum* is the only variety known to occur in the San Bernardino Mountains (Mooring and Johnson 1993).

Eriophyllum lanatum var. *obovatum* is a perennial herb that blooms June–July (California Native Plant Society 2001). This taxon appears to be relatively tolerant of disturbance. Plants have been observed in areas along roadbanks and in locations where selective logging has occurred (Shevock 1977). Plants in the San Bernardino Mountains also occur along roadsides and trails and in locations where soils has been disturbed (USDA Forest Service 2002).

Eriophyllum lanatum var. *obovatum* has 1-5 cm leaves that are entire to few-toothed distally. There is one inflorescence head. The peduncle is 3-10(15) cm and is often more or less swollen below the head. The involucre is 7-10 mm. The ligules are 6-7 mm. The disk flower corollas are 3-4 mm. Fruit are 2.5-3 mm and are more or less glabrous. The pappus is less than 1 mm (Mooring and Johnson 1993).

Habitat Description

Eriophyllum lanatum var. *obovatum* occurs in lower and upper montane coniferous forests at elevations of 4,225–8,125 feet (1,300–2,500 meters) (California Native Plant Society 2001). The species typically occupies forest openings (Mooring and Johnson 1993, USDA Forest Service 2002). Plants are often found beneath an overstory of Jeffrey pine, black oak, and/or Mexican manzanita. Associated species include *Erysimum capitatum*, *Penstemon* spp., *Arctostaphylos pungens*, and *Ceanothus cordulatus*. Soils are derived from granite. The topsoil is usually highly organic, often covered with a layer of pine needles (USDA Forest Service 2002). *Eriophyllum lanatum* var. *obovatum* is generally scattered in forest openings in small pockets.

Occurrence Status

Population status and trends for *Eriophyllum lanatum* var. *obovatum* on National Forest System lands are unknown. This taxon appears to be well distributed throughout its range in the San Bernardino Mountains; however, in recent years, sightings have been less frequent (USDA Forest Service 2002).

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences. Only information for occurrences in or immediately adjacent to the Province is included. There are other CalFlora (2002) records from Kern, Tulare, and Siskiyou counties.

OCCURRENCE DATA – *Eriophyllum lanatum* var. *obovatum* (Southern Sierra woolly sunflower)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County

*	~10	2002	Eastern edge of Little Green Valley, N of Green Valley Trail 2W10. Lower, eastern edge of meadow on dry open slopes above. Mixed conifer forest of <i>Pinus jeffreyi</i> and <i>Abies concolor</i> . W/ <i>Equisetum laevigatum</i> , <i>Lotus nevadensis davidsonii</i> . Foot trail along southern edge of meadow. SBNF.	SBD
*	700	1999	W side of road, ca. 1.5 road mi. S of JCT of Mill Creek Rd. and Tulip Rd. Dry meadow dominated by graminoids. Forbs present include <i>Eriogonum wrightii</i> , <i>Castilleja applegatei</i> , <i>Lotus</i> sp., <i>Phacelia</i> sp., <i>Ceanothus cordulatus</i> , <i>Arctostaphylos pungens</i> , <i>Monardella villosa</i> , <i>Salix</i> sp. Soils are coarse granite with an organic top layer. Near a road leading to a Forest Service recreation cabin. There are no visible disturbances, but possible threats include foot traffic. SBNF.	SBD
*	50	1999	E side of Cabin 56, along Mill Creek Rd., S of JCT with Tulip Rd. Sparse overstory of <i>Pinus jeffreyi</i> , <i>Quercus kelloggii</i> . Understory spp. include <i>Penstemon grinnellii</i> , <i>Penstemon labrosus</i> , <i>Erysimum capitatum</i> , <i>Ceanothus cordulatus</i> , <i>Arctostaphylos pungens</i> . Soil covered with pine needles. No visible disturbance. SBNF.	SBD

*	100	1999	N of Cabin 81 at corner of JCT of 2N10 and road to Cedar Lake. Sparse overstory of <i>Pinus jeffreyi</i> , <i>Quercus kelloggii</i> . Understory spp. Include <i>Penstemon grinnellii</i> , <i>Penstemon labrosus</i> , <i>Erysimum capitatum</i> , <i>Ceanothus cordulatus</i> , <i>Arctostaphylos pungens</i> . Soil covered with pine needles. No current disturbance. SBNF.	SBD
*	21	1999	Between Cabins 30, 31 and in front of Cabin 49 along Mill Creek Road, just S of JCT w/ Tulip Rd. Plants growing under sparse canopy cover of <i>Pinus jeffreyi</i> , <i>Quercus kelloggii</i> . Understory species include <i>Penstemon grinnellii</i> , <i>Penstemon labrosus</i> , <i>Erysimum capitatum</i> . Soil covered with pine needles. SBNF.	SBD
1376754, 1470876, 1376753	U	U	Bear Valley, San Bernardino Mountains. 1376753 is type specimen. Land owner: U.	SBD
1373250	U	1926	Goat landing ca. 0.5 mi. W of Bear Valley. Land owner: U.	SBD
1296980	U	1959	Running Springs, 1.7 mi. NW from; along SH 80 to Lake Arrowhead. Land owner: U.	SBD
1333349, 1333397	U	1976	Big Bear Lake, ca. 1.5 mi. due S of W end; W of Bluff Lake. SBNF.	SBD
1471682, 1381837	U	1894	Bear Valley; San Bernardino Mountains and their E base. Land owner: U.	SBD
1397934	U	1933	Elsie Caves. SBNF.	SBD

1470877	U	1931	Bluff Lake. Land owner: Wildlands Conservancy (formerly a YMCA camp).	SBD
1428387	U	1904	Little Green Valley, San Bernardino Mountains. Land owner: U.	SBD
1422911, 1422912, 1374115	U	1899	San Bernardino Mountains. Land owner: U.	SBD
1333208	U	U	Green Valley Lake. Land owner: U.	SBD
1823021	U	1937	Arrow Bear. Land owner: U.	SBD
1199114	U	1931	Arrowhead Lake, San Bernardino Mountains. Land owner: U.	SBD
1823023	U	1986	Running Springs in yellow pine forest near intersection of Pixie Rd. and Enchanted Way. Land owner: U.	SBD
*	U	2001	T2N, R2W, Section 23, Keller Peak Quad. Along Forest Road 2N13 and 2N19 beneath powerlines. Observed during Verizon Cable Surveys in 2001. Plants occur along roadsides and disturbed areas in various locations along survey route. See file for exact locations (Kopp). Habitat was avoided during project implementation. SBNF	SBD
*	U	2001	T2N, R2W, section 36. Keller Peak Quad. Plants present in various locations surveyed for Trials Motorcycle event. See project file for exact locations. Event was not approved, no effects to plants or habitat. (Kopp/Stamer) SBNF	SBD

*	50plus	2001	T2N, R1W, Section 34 Big Bear Lake Quad. Plants observed near the beginning of the Lodgepole Pine Trail. Plants occurred away from trail but could be viewed from trail. Many individuals present, no effects noted. (Kopp) SBNF	SBD
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- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Eriophyllum lanatum var. *obovatum* occurrences are present within the Metcalf and Snow Valley Recreational Residence Tracts on the Mountaintop District of the San Bernardino National Forest. Effects are unknown at this time. Plants that occur along trails, roads and power lines may be affected by recreational use and maintenance activities. If plants are still present in the City Creek area, they may have burned or have been affected by suppression activities. Removal of hazard trees along roads and recreational sites and in mortality areas may also disturb habitat. All of these types of disturbance may affect individuals, however *Eriophyllum lanatum* var. *obovatum* appears to tolerate some level of disturbance; plants are often found in openings created by disturbance.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Eriophyllum lanatum* var. *obovatum*:

- Advise recreation residence tract cabin owners about the presence of *Eriophyllum lanatum* var. *obovatum*, and monitor these occurrences.
- Relocate City Creek occurrence as this appears to be outside the current known range of this species on the San Bernardino National Forest.
- Survey all new occurrences of *Eriophyllum lanatum* var. *obovatum* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Eriophyllum lanatum* var. *obovatum* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Eriophyllum lanatum* var. *obovatum* in the planning area using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

This taxon appears to be relatively tolerant of disturbance. Plants have been observed in areas along road banks and in locations where selective logging has occurred (Shevock 1977). Plants in the San Bernardino Mountains also occur along roadsides, trails and power lines and in other locations where soils has been disturbed (USDA Forest Service 2002). The plants occur in at least 12 documented locations on the Mountaintop District of the San Bernardino National Forest; eight of these locations have been recently documented.

Based on this analysis, *Eriophyllum lanatum* var. *obovatum* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Eriophyllum lanatum var. *obovatum* is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Eriophyllum lanatum* var. *obovatum* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Eriophyllum lanatum* var. *obovatum* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Eriophyllum lanatum* var. *obovatum* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Eriophyllum lanatum var. **hallii**

Fritillaria falcata

Fritillaria falcata

Fritillaria falcata (Jepson) D. Beetle (Tallus fritillary)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Fritillaria falcata occurs primarily in the Diablo Range from Alameda County to San Benito County, with a disjunct occurrence in the Santa Lucia Range in Monterey County (California Natural Diversity Database 2004, Matthews 1997).

Distribution in the Planning Area

Fritillaria falcata occurs at two locations near South Ventana Cone in the Ventana Wilderness Area on the Los Padres National Forest (California Natural Diversity Database 2004).

Taxonomy and Natural History

Fritillaria falcata is a monocot in the lily family (Liliaceae).

Fritillaria falcata is a bulb-bearing perennial herb that blooms March–April (California Native Plant Society 2001).

Habitat Description

Fritillaria falcata appears to grow almost exclusively on talus slopes derived from serpentine within chaparral, cismontane woodland, and lower montane coniferous forest at elevations of 1,100–5,000 feet (330–1,525 meters) (California Native Plant Society 2001). Occurrence #1 is reported to be located on

granitic scree, and Occurrence #2 on serpentine (California Natural Diversity Database (2004).

Occurrence Status

Fritillaria falcata is distributed in several highly restricted occurrences and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). Population trends of *Fritillaria falcata* on National Forest System lands are unknown, but vulnerability appears low due to the species presence in a designated wilderness. The number of plants present at known occurrences varies from a few plants to more than 5,000 plants (California Natural Diversity Database (2004).

There are two occurrences of *Fritillaria falcata* on the Los Padres National Forest: Occurrence #1 on the north slope of South Ventana Cone consisted of 8 plants in 1980 (California Natural Diversity Database (2004); Occurrence #2 on the north slope of Pine Ridge consisted of 12 plants in 1980 (California Natural Diversity Database (2004).

Threats

Fritillaria falcata is potentially threatened at some locations on private land by vehicle traffic (California Native Plant Society 2001). The Los Padres National Forest occurrence is located in a designated wilderness area and is not subject to any known threats. The plants on the north slope of South Ventana Cone are located near Pine Ridge Trail but Forest Service resource specialists and trail maintenance workers are aware of its location and the need to avoid damage to plants and habitat.

Conservation and Management Considerations

Protect all occurrences found on National Forest System land.

Evaluation of Current Situation and Threats on National Forest System Lands

Fritillaria falcata is uncommon on National Forest System lands but where present the plant's habitat does not appear to be affected by current and anticipated land uses. Under all alternatives, habitat for *Fritillaria falcata* would be located in the Ventana Wilderness.

Based upon the above analysis *Fritillaria falcata* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Fritillaria falcata is a USDA Region 5 Forest Service Sensitive species. This assures that any new

project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Fritillaria falcata* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Fritillaria falcata* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Eriophyllum lanatum var.
obovatum**

Fritillaria liliacea

Fritillaria liliacea

Fritillaria liliacea Lindley (Fragrant fritillary)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G2 S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Fritillaria liliacea is endemic to central western California from Sonoma County in the north to northern Monterey County in the south (California Native Plant Society 2001, Ness 1993).

Distribution in the Planning Area

Fritillaria liliacea may occur on the Los Padres National Forest at Pfeiffer Point, Big Sur (CalFlora 2002). The location (Occurrence #28 in California Natural Diversity Database 2004) is based on a 1917 collection by Parsons and is not adequately precise to allow a determination of land ownership for the collection site.

Taxonomy and Natural History

Fritillaria liliacea is a monocot in the lily family (Liliaceae). The plants found at Pfeiffer Point have been proposed as a new subspecies ("pfeifferensis"), but this name has not yet been published (Matthews 1997).

Fritillaria liliacea is a bulbiferous perennial herb that flowers February–April (California Native Plant Society 2001).

Habitat Description

Fritillaria liliacea is found in cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland, often on serpentinite substrates (California Native Plant Society 2001). *Fritillaria liliacea* is found at elevations below 1,350 feet (410 meters). In Monterey County, the habitat is described as heavy soil in open fields and hills near coast (Matthews 1997).

Occurrence Status

Fritillaria liliacea is a monocot in the lily family (Liliaceae). The plants found at Pfeiffer Point have been proposed as a new subspecies ("pfeifferensis"), but this name has not yet been published (Matthews 1997).

Fritillaria liliacea is a bulb-bearing perennial herb that flowers February–April (California Native Plant Society 2001).

Threats

Threats to *Fritillaria liliacea* include grazing, agriculture, urbanization, and nonnative plants (California Native Plant Society 2001). The status of *Fritillaria liliacea* on the Los Padres National Forest is unknown but of the listed threats only competition from nonnative plants is likely to be a factor for any plants found on National Forest System land, as there is no grazing, urbanization, or agriculturization occurring on these lands at Big Sur.

Conservation and Management Considerations

More information is needed to determine if *Fritillaria liliacea* occurs on the Los Padres National Forest.

Evaluation of Current Situation and Threats on National Forest System Lands

Fritillaria liliacea may occur on the Los Padres National Forest and if so it is apparently very rare on National Forest System lands as most of the species' historic range is north of the Los Padres National Forest.

Based upon the above analysis *Fritillaria liliacea* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Fritillaria liliacea* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly

speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Fritillaria liliacea*.

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Fritillaria falcata

Fritillaria ojaiensis

Fritillaria ojaiensis

Fritillaria ojaiensis A. Davids. (Ojai fritillary)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G1, S1.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Fritillaria ojaiensis is found on Cuesta Ridge in San Luis Obispo County, and from the San Rafael and Santa Ynez Mountains of Santa Barbara to Nordhoff Ridge and the Topatopa Mountains of Ventura County, where it is known from about 10–15 occurrences (Ness 1993, California Natural Diversity Database 2004, Keil and others 1985). In addition, Matthews (1997) reported this plant as being present in the South Coast Ridge area (the plants there having been previously identified as *Fritillaria viridea*). Norman (1993) also reports finding *Fritillaria ojaiensis* along the South Coast Ridge Road. Additional information regarding Cuesta Ridge studies of *Fritillaria ojaiensis* prior to 1976 may be attainable; see Bollong 1976 (Painter pers. comm.).

Distribution in the Planning Area

All occurrences of *Fritillaria ojaiensis* are on or adjacent to the Los Padres National Forest (California Natural Diversity Database 2004). On the Ojai Ranger District, *Fritillaria ojaiensis* occurs near Big Cone Camp, Cross Camp (upper Santa Paula Canyon), Gridley Trail south of Gridley Springs Camp, Sisar Canyon (Red Reef Trail to White Ledge Campground), Dron property, McGuire Flats, East Fork of Senior Canyon (Magney 2002), north of the Taft Ranch adjacent to FS road 4N05, Valley View Campground off the Pratt Trail, Bear Creek, and south of Wheeler Gorge Fire Station (Magney 2002, Magney 2003); it has also been reported from the Ventura River. On the Santa Barbara Ranger District, *Fritillaria ojaiensis* has been found in the Santa Ynez Mountains on north slopes from Santa Barbara to Refugio Pass including along West Camino Cielo; inland from Upper Blue Canyon and Juncal Dam west to Alexander Trail near Oso Creek (Smith 1998); and, also at Catharina Creek. On the San Luis Ranger District, *Fritillaria ojaiensis* has been reported from Colson Canyon, from several locations

around Zaca Peak, Zaca Lake, Manzana Creek, near White Ledge Campground, and within the Cuesta Ridge Botanical Special Interest Area. Plants from the Monterey Ranger District, tentatively identified as *Fritillaria ojaiensis*, are found near South Coast Ridge Road (Matthews 1997, Norman 1993). Painter (2004) states that material from Monterey County "needs determination by specialists or knowledgeable taxonomist".

Taxonomy and Natural History

Fritillaria ojaiensis is a monocot in the lily family (Liliaceae). It is distinguished from similar congeners by floral characters and geographic range (Ness 1993). *Fritillaria ojaiensis* is an erect perennial to a height of 28 inches (70 cm) with slender, linear leaves in 1-3 whorls of 3-5 leaves near the base. The leaves are alternate or opposite on the middle and upper portions of the stem. The leaves are 1.6-5 inches (4-13 cm) long and linear to narrowly lanceolate. The flowers are nodding and greenish-yellow with purple mottling. The perianth segments are 0.6-1.2 inches (1.5-3 cm) long and widely lanceolate. The nectary is somewhat indistinguishable from the rest of the flower.

Fritillaria ojaiensis is a perennial bulbiferous herb that blooms February through May. A flat, strap-shaped leaf that grows along the ground precedes the flowering stalk and although it originates from the same bulb it is often not connected to the inflorescence and thus can appear to be derived from a separate plant. This strap-shaped leaves are produced in greater abundance than flowering stems and are detectable from January through the flowering period.

Habitat Description

Fritillaria ojaiensis grows on moist slopes in chaparral, in mesic broad-leaved upland woodlands (often near drainages), and in lower montane conifer forests at elevations of 980-2,200 feet (300-670 meters) (California Native Plant Society 2001). *Acer macrophyllum* and *Umbellularia californica* are common associates. Plants found near the South Coast Ridge Road are in openings in brush and woodland on or near serpentine. Plants found in the Topatopa Mountains are usually found on poorly consolidated soils associated with landslides (Burgess 2000).

Occurrence Status

Fritillaria ojaiensis is distributed in several highly restricted occurrences and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). Population status and trends are unknown, but it is considered to have low vulnerability on National Forest System lands (Stephenson and Calcarone 1999). *Fritillaria ojaiensis* has been reported from about 29 locations.

Population Abundance - *Fritillaria ojaiensis* (Ojai Fritillary)

3	n/a	250+	1947 1988 2003	Near Wheeler Gorge (Pollard); Wheeler Gorge on steep slope above gorge falls, E-side of Hwy 33; also along lower Bear Ck. (216+ plants in 2003); Ventura Co (Magney2003)/LPNF
4	n/a		1961 1993	Upper Oso Canyon at Nineteen Oaks Camp, N of Santa Ynez River, SB Co (Santana 1980, Magney 1993)/LPNF
5	n/a	~100	1922 1988	Big Cone Camp, Pine Flat (Martindale) (Type Locality), Santa Paula Canyon (3 colonies – Big Cone Camp, west of Big Cone @ 1,700 ft. elev., & Cross Camp), Ventura Co (Magney 1988)/LPNF
6	n/a	63	1987	Gridley Canyon, along Gridley Springs Trail at ~2,200 ft. elev. (Magney 1984) Ventura Co/LPNF
7	n/a	65	1991	Gridley Canyon, three colonies along trail near Gridley Campground (Burgess), Ventura Co/LPNF
8	n/a		1993?	Horn Canyon, Ventura Co (Magney)/LPNF
9	n/a		1993?	Stewart Canyon, Ventura Co (Magney)/LPNF
10	n/a		1945 1993?	Ocean View Trail west of Ojai, Ventura Co (Pollard; Magney)/LPNF
11	n/a		1993?	Tequepis Canyon along trail to Broadcast Peak, SB Co (Magney)/LPNF
12	n/a		1986	Ridgetop E of Little Falls Spring at head of Little Falls Creek, S of Santa Margarita Lake, SLO Co/Pvt
n/a	1817905		1994	Lower Colson Canyon, near Tepusquet Cyn, 2.3 mi. E of Santa Maria (Smith 12529), SB Co/Pvt

n/a	895424		1991	Cuesta Ridge, SLO Co (Hoover; Junak 1991)/LPNF?
n/a	1617861		1985	Reservoir Canyon, north slope, near San Luis Obispo, SLO Co (Keil 1373)/Pvt
n/a	1817906 1823072 1817904		1993 1994	Road to Dabney Cabin, Zaca Lake, road to Manzana Schoolhouse from Davy Brown (Smith 12425); ENE of Zaca Lake, road from Davy Brown to Dabney Cabin, (Smith 12443), E of Zaca Lake on upper slope to Manzana Creek (Smith 12525); 4.3 mi from locked gate, San Rafael Mtns, SB Co/LPNF
n/a	1461977		1937	Ventura River, steep rocky west slope (Clokey & Clokey 5811), Ventura Co/Pvt
n/a	n/a			5 mi W of San Marco Pass on Camino Cielo (Coykendall), SB Co/Pvt
n/a	n/a	20	1996	Catharina Creek, SB Co/LPNF
n/a	n/a		1925	Morro Creek, chaparral (Munz 9213), SLO Co/Pvt?
n/a	n/a		1961	Oso Creek, Santa Cruz Trail, 1,300 ft elev. (Blakley 4012), SB Co/LPNF?
n/a	n/a		1966	Blue Cyn, north of Juncal Road (Allen), SB Co/LPNF?
n/a	n/a		?	Nojoqui Falls (Dearing 4084)
n/a	n/a		?	Between Zaca Peak and Manzana Creek (Blakley 6545)
n/a	n/a		?	Refugio Pass Road, ca. 2 mi. N of Refugio Pass (Haller 1514), SB Co/Pvt?

n/a	n/a		1938	Le Jeune Ranch just above Painted Cave, 2500 ft. elev. (Rodwick), SB Co/Pvt?
n/a	n/a	400	1999	Sisar Canyon (four colonies: one on Red Reef Trail to White Ledge Campground near trailhead @ 3,300 ft. elev.; second colony closer to White Ledge Campground extirpated by flooding induced erosion (Burgess); third population below switchbacks in oak grove at 2,000 ft. elev. (Burgess), Dron Property/Howard Place @ 2,740 ft. elev., Ventura Co/LPNF
n/a	n/a			Silver Peak, Monterey Co/LPNF
n/a	n/a	4	1993	South Coast Ridge Road, 5.8 mi N of Willow Creek Road (Norman) Monterey Co/LPNF
n/a	n/a	15+	1993	South Coast Ridge Road, 2 mi N of Willow Creek Road (Norman) Monterey Co/LPNF
n/a	n/a	5+	1993	South Coast Ridge Road, 3.4 mi S of Willow Creek Road (Norman) Monterey Co/LPNF
n/a	n/a	~25	1996	Arroyo Burro Trail, Santa Ynez Mtns (Marx) SB Co/LPNF
n/a	n/a	~20	2002	Nordhoff Ridge, east tributary canyon to Senior Canyon on private property at 1,700 ft. elev. (Magney 2002), Ventura Co/Pvt

Surveys for *Fritillaria ojaiensis* have been conducted, generally with negative results. The following locations have been searched and no *Fritillaria ojaiensis* was detected (Magney 1984): Aqua Blanca Creek from Log Cabin to Devil's Potrero, Sisar Canyon to Hines Peak, Piru Creek from Ellis Apiary to 1 mile north of Aqua Blanca Creek, Matilija Canyon, Rose Valley, and Casitas Pass on Highway 50. Later, the following areas were searched with negative results: Laguna Ridge/Poverty Canyon, Murietta Canyon, Matilija Canyon, Rancho Matilija (Wills Canyon and Rice Canyon), Santa Ynez Mountains along eastern 2.5 miles of East Camino Cielo, Ojala, Dry Lakes Ridge, Rose Valley, Rose Valley Falls, Lion Canyon (north side of Nordhoff Ridge), Howard Creek, Tule Creek, Derrydale Creek, Cherry Creek, Sulphur Mountina, Rincon Creek, Coyote Creek Ranch above Casitas Fire Station (Magney, personal communication 2003).

Threats

Potential threats on National Forest System lands include road, trail, and campground maintenance, and recreational foot traffic (California Natural Diversity Database 2004).

Conservation and Management Considerations

Within its known range, *Fritillaria ojaiensis* may be more common than indicated by current records. Factors that may result in *Fritillaria ojaiensis* being under-reported in the botanical literature include (Burgess, pers. comm.):

- *Fritillaria ojaiensis* has a somewhat cryptic growth form, the plants being easily overlooked when growing amongst grasses and other vegetation.
- *Fritillaria ojaiensis* blooms early (March) when fewer botanical surveys are conducted.
- *Fritillaria ojaiensis* has a propensity to grow in inaccessible areas such as unstable slopes, under dense vegetation, and on steep north-facing slopes.

Evaluation of Current Situation and Threats on National Forest System Lands

Fritillaria ojaiensis is uncommon despite its wide distribution from the Santa Lucia Mountains south to the Topatopa Mountains, with most occurrences relatively small in size and limited in area occupied. However, these small patches of habitat are largely located in areas not subject to current or anticipated management activities. Use of the population occurrence information and completion of project surveys would be adequate, in most instances, to avoid direct and indirect effects to this species.

Based upon the above analysis *Fritillaria ojaiensis* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Fritillaria ojaiensis is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Fritillaria ojaiensis* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Fritillaria ojaiensis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Fritillaria liliacea

Fritillaria viridea

Fritillaria viridea

Fritillaria viridea Kellogg (San Benito fritillary)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G3, S3.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 1-2-3

General Distribution

Fritillaria viridea is known primarily from the vicinity of San Benito Mountain in San Benito County. One of two reported occurrences from Monterey County may be based on misidentified Ojai fritillary (*Fritillaria ojaiensis*) (Matthews 1997). Matthews (1997) does not report *Fritillaria viridea* as being present in Monterey County. However, there is a collection of *Fritillaria viridea* from near Cone Peak (CNDDDB Occurrence #7, Bacigalupi collection from 1923) and a recent report of *Fritillaria viridea* from South Coast Ridge Road (Painter & Neese collection). Two other disjunct occurrences have been reported, both from San Luis Obispo County, one of which was based on a single individual plant (Hoover 1970, California Natural Diversity Database 2004). The second location in San Luis Obispo County is on Hwy 41 on grade 6 miles above (east of) Morro Bay (California Natural Diversity Database 2004).

Distribution in the Planning Area

The disjunct occurrences reported from Monterey and San Luis Obispo Counties are on or adjacent to the Los Padres National Forest (California Natural Diversity Database 2004). On the Monterey Ranger District, *Fritillaria viridea* is reported to be present along a horse trail to Cone Peak, about 2 miles from the North Fork of the San Antonio River (California Natural Diversity Database 2004), and from the South Coast Ridge Road on the boundary with Fort Hunter Liggett (Painter and Neese, Painter 2004). Hoover (1970) reported a single plant occurring northwest of Cuesta Pass in a leather oak thicket (Occurrence #5), an area that is now within the Cuesta Ridge Botanical Area. Junak's inventory (1991) of the Cuesta Ridge Botanical Area failed to detect the presence of *Fritillaria viridea* though one

individual of *Fritillaria* was observed and tentatively identified as *Fritillaria affinis*. Additional information regarding studies conducted on Cuesta Ridge prior to 1976, may be obtained; see Bolong 1976 (Painter pers. comm.)

Taxonomy and Natural History

Fritillaria viridea is a monocot in the lily family (Liliaceae). It is closely related to Ojai fritillary (*Fritillaria ojaiensis*) and checker lily (*Fritillaria affinis*). Flower color is highly variable in these species even within populations, and careful study is needed to distinguish between them (Hickman 1993). *Fritillaria viridea* is a perennial herb from a bulb and is 12 to 26 inches (3-6.5 dm) tall. The leaves are in 1-2 whorls of 3-4 near the base and alternate above. They are 1.6 to 4 inches (4-10 cm) long and narrowly lanceolate. The flowers are nodding, pale green to almost black with the nectary at 1/2 the perianth length.

Fritillaria viridea is a bulb-bearing perennial herb that blooms March–May (California Native Plant Society 2001).

Habitat Description

Fritillaria viridea occurs on slopes within serpentine chaparral in the foothill and lower montane conifer zones (California Native Plant Society 2001). At South Coast Ridge Road, associates include *Arctostaphylos glandulosa*, *Heteromeles arbutifolia*, *Adenostoma fasciculatum*, *Rhamnus ilicifolia*, *Pinus sabiniana*, *Marah fabaceus* and *Clematis lasiantha*.

One of the reported occurrences in Monterey County is on calcareous shale (Stephenson and Calcarone 1999), which suggests one of two outcomes: 1) *Fritillaria viridea* occurs on more substrates than just serpentine; or, 2) the plants found near Cone Peak are not *Fritillaria viridea*.

Occurrence Status

Fritillaria viridea is distributed in a limited number (about six) of occurrences and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). Population trends of *Fritillaria viridea* on National Forest System lands are unknown.

Threats

Habitat for *Fritillaria viridea* has been negatively affected by unauthorized off-highway vehicle use and mining activities (California Native Plant Society 2001). No specific risks have been identified on National Forest System lands. At the South Coast Ridge Road occurrence site quality was rated good but some potential threats were noted such as road dust, road maintenance, non-native plants, feral pigs, and livestock grazing (Painter and Neese).

Conservation and Management Considerations

More information is needed on the taxonomic identity, population status, and potential threats for the *Fritillaria* plants found near Cone Peak and the South Coast Ridge Road on the Los Padres National Forest.

Evaluation of Current Situation and Threats on National Forest System Lands

Fritillaria viridea appears to be very rare on National Forest System lands but despite the plant's rarity its habitat is reported to be in good condition and no ongoing activities have been identified that are currently degrading habitat for *Fritillaria viridea*. Where present, or rumored to be present, habitat for *Fritillaria viridea* is located in designated Wilderness or within established botanical special interest areas. Current and anticipated land uses in these areas are not expected to impact habitat for *Fritillaria viridea*.

Based upon the above analysis *Fritillaria viridea* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Fritillaria viridea is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Fritillaria viridea* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Fritillaria viridea* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Fritillaria ojaiensis

**Galium angustifolium ssp.
gabrielense**

Galium angustifolium ssp. gabrielense

Galium angustifolium Nutt. ssp. *gabrielense* (Munz & I.M. Johnston) Dempster & Stebbins (San Antonio Canyon bedstraw)

Management Status

Federal: Forest Service Watch List

California: G5T3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Galium angustifolium ssp. *gabrielense* is distributed in Los Angeles and San Bernardino counties. Occurrences are found in the eastern San Gabriel Mountains near San Antonio Canyon and in the San Bernardino Mountains near Jenks Lake. There are 12 known occurrences with known locations and six records from unknown locations. Records in the San Gabriel Mountains include Icehouse Canyon, Glacier Campground, the San Antonio Ski Hut, below the Mt. Baldy ski lift, Crystal Lake Recreation Area, Cow Canyon Saddle, Evey Canyon, and Sunset Mountain Road (Calflora 2002).

Distribution in the Planning Area

All 12 occurrences are on National Forest Lands. Eleven of the occurrences are on the Angeles National Forest (ANF) and the occurrence near the Jenks Lake Junction is within the San Bernardino National Forest (SBNF).

Taxonomy and Natural History

Galium angustifolium ssp. *gabrielense* is a tufted perennial in the madder family (Rubiaceae). The plant is more or less hairy with a woody base. The stem is generally 6-30 cm, with the ridges narrower than the surfaces between. Leaves are generally 2-14 mm long, and the inflorescence is narrow, few-flowered and more or less dense. Corollas are yellow or reddish and bristly on the outside. Fruits are nutlets, generally greater than the pedicel and have dense, long, straight, and spreading hairs (Dempster 1993). Flowering occurs between April and August (California Native Plant Society 2001).

Habitat Description

Galium angustifolium ssp. *gabrielense* occurs on drier slopes and ridges in high (montane?) chaparral and open forest (Dempster 1993). The taxon is associated with granitic, sandy, or rocky soil types within chaparral and lower montane conifer habitats between 4,000 and 8,700 feet elevation (California Native Plant Society 2001).

Occurrence Status

The California Natural Diversity Database (2004) does not contain any records for *Galium angustifolium* ssp. *gabrielense*. However, there are 17 records listed in the CalFlora database (2002). Six of these do not provide location information, and the most recent record is from 1971. For this reason, trends in occurrence abundance and distribution are unknown. Although *Galium angustifolium* ssp. *gabrielense* is considered uncommon (USDA Forest Service 2002), more information is needed to determine the current distribution of the taxon on National Forest lands.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Galium angustifolium* ssp. *gabrielense* (San Antonio Canyon bedstraw)

Occurrence No. (Calflora 2002)	No. of Plants	Year Reported	Location/Land Owner	County
1220303	U	1966	Mt. Baldy ski lift about one mi below; along road. San Gabriel Mountains. ANF	SBD
1321472	U	1965	Icehouse Canyon ca 2 ½ mi up; ½ mi below Columbine Spring, San Gabriel Mountains. ANF	SBD
486753	U	U	Unknown location. U	SBD
1663760	U	1971	Unknown location. U	SBD
1255302	U	1918	San Antonio Canyon. San Gabriel Mountains. U-probably ANF	SBD

1185052	U	1957	Glacier Campground, San Gabriel Mountains. ANF	SBD
1185051	U	1957	San Antonio Ski Hut near stream below San Gabriel Mountains. ANF	SBD
1633768	U	1971	Unknown location. U	SBD
486783	U	U	Unknown location. U	SBD
1220290	U	1965	Jenks Lake Junction Hwy 38 1.3 mi w; n slope San Bernardino Mts. SBNF	SBD
1321549	U	1967	Crystal Lake Recreation Area above San Gabriel Mts., Big Cienega Spring. ANF	LA
1633759	U	1971	Unknown location. U	LA
486752	U	U	Unknown location. U	LA
1220306	U	1966	Sunset Mtn Rd.; head of canyon, San Gabriel Mts., Evey Canyon. ANF	LA
1220305	U	1966	Mt. Baldy w; Cow Canyon Saddle w of Mt. Baldy, San Gabriel Mtns. ANF	LA
1220304	U	1966	Sunset Mtn. Road, San Gabriel Mts. ANF	LA
1225269	U	1919	Cow Canyon Divide, San Gabriel Mts. ANF	LA

111501 (UCR)	U	1998	Altadena, ca. 800 m SSW of Mt. Lowe, N end of Tanoble Dr. at Woodglen Ln., and along trail to the NE.ANF	LA
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- *U = Unknown*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

Threats

Threats to specific occurrences of *Galium angustifolium* ssp. *gabrielense* are unknown. On the ANF, it is possible that occurrences could be affected by roads, developed and dispersed recreational activities, and activities under special use permit at Mt. Baldy Ski Area. On the SBNF, it is possible the Jenks Lake occurrence may have been affected by shaded fuelbreak construction and maintenance within the last five years. Treatment of high conifer mortality in this location may also affect habitat as may dispersed recreational use. However, because *Galium angustifolium* ssp. *gabrielense* occurs on drier slopes and ridges in chaparral and within open forest, limited activities that create forest openings may not negatively affect habitat for this species.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Galium angustifolium* ssp. *gabrielense*:

- Survey all new occurrences of *Galium angustifolium* ssp. *gabrielense* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Galium angustifolium* ssp. *gabrielense* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Galium angustifolium* ssp. *gabrielense* in the Province using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest system Lands

Galium angustifolium ssp. *gabrielense* is distributed in Los Angeles and San Bernardino counties in granitic soils within chaparral and lower montane coniferous forest. There are at least 17 known occurrences distributed in the eastern San Gabriel Mountains and the San Bernardino Mountains and

potential habitat is present. As described above, there are no known substantial threats to the distribution or persistence of *Galium angustifolium ssp. gabrielse*.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Galium angustifolium ssp. gabrielse is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Galium angustifolium ssp. gabrielse* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Galium angustifolium ssp. gabrielse* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Galium angustifolium ssp. gabrielse* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Fritillaria viridea

**Galium angustifolium ssp.
jacinticum**

Galium angustifolium* ssp. *jacinticum

Galium angustifolium Nutt. ssp. *jacinticum* Dempster & Stebb. (San Jacinto Mountains bedstraw)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T1; S1.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Galium angustifolium ssp. *jacinticum* is endemic to the San Jacinto Mountains in Riverside County. It is known from approximately ten occurrences within the Lake Fulmor, Black Mountain, Alandale Pines, Hall Canyon, Dark Canyon, and Idyllwild areas (California Native Plant Society 2001; California Natural Diversity Database 2004, RSABG herbarium).

Distribution in the Planning Area

At least six occurrences are present on the San Bernardino National Forest near Black Mountain, Lake Fulmor, Alandale Ranger Station, Dark Canyon, Hall Canyon and north of Alvin Meadows (California Natural Diversity Database 2004, RSABG herbarium).

Taxonomy and Natural History

Galium angustifolium ssp. *jacinticum* is a dicotyledonous plant in the bedstraw family (Rubiaceae). Eight subspecies of *Galium angustifolium* are recognized, occurring throughout southern California (Dempster 1993). *Galium angustifolium* ssp. *jacinticum* is distinguished from the other subspecies by its narrow, few-flowered inflorescence and relatively larger stature.

Galium angustifolium ssp. *jacinticum* is a perennial herb that flowers June–August (California Native Plant Society 2001).

Galium angustifolium ssp. *jacinticum* is a low, generally glabrous plant or with more or less hairy leaves. The stems are 15-35 cm long with ridges more or less as wide as the surfaces between. Leaves are generally 11-26 mm. The inflorescence is narrow, few-flowered, and more or less open. Corolla hairs are scattered (Dempster 1993).

Habitat Description

Galium angustifolium ssp. *jacinticum* grows in the understory of open mixed forest and lower montane coniferous forests. It occurs at elevations of approximately 5,400-6,400 feet (1,630-1,940 meters) (California Native Plant Society 2001, California Natural Diversity Database 2004, Dempster 1993).

Mixed forest and lower montane coniferous forest habitat is widespread within the planning area; however, not enough is known about this taxon to determine its microhabitat associations.

Occurrence Status

Galium angustifolium ssp. *jacinticum* is distributed in highly restricted occurrences, but is not considered to be in danger of extirpation (California Native Plant Society 2001). The population trend of *Galium angustifolium* ssp. *jacinticum* on National Forest System lands is unknown.

The table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Galium angustifolium* ssp. *Jacinticum* (San Jacinto Mountains bedstraw)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1960's	Black Mountain Road, ca. 0.9 mi. above junction to Pine Wood, San Jacinto Mountains. Type locality. SBNF.	RIV
2	U	1960's	Lake Fulmor, San Jacinto Mountains. Open, dry pine forest. SBNF.	RIV
3	U	1960's	Alandale Pines, San Jacinto Mountains. Near Alandale USFS Ranger Station. SBNF.	RIV

4	U	1901	Tamarack Creek, east side San Jacinto Mountains, Exact location unknown, mapped in the vicinity of Tamarack Valley.	RIV
633329(RSA)	U	1969	Above James Reserve in Hall Canyon. 5500'. Yellow pine forest. San Jacinto Mtns. SBNF.	RIV
48868 (RSA)	U	1924	Dry slope near Dark Canyon, San Jacinto Mtns. 5000'. U. (Munz)	RIV
*	U	1966	Along Black Mt Rd 2.2 miles above junction with Pinewood Road (Dempster/UC/Jeps)	RIV
*	U	1977	N side of Hwy 243 1.5 mi below Twin Pines Ranch Rd (McMullen flat). N slope of peak, burned last fall T3S, R1E S23 sw1/4. (Sanders, McKay/RSA) <i>This one herbarium record did not have spp. Jacintum on it but is it same area maybe?</i>	RIV
*	U	1965	Between Fulmor Lake and road to Banning and Idyllwild (Dempster/UC/Jeps)	RIV
633875 (RSA)	U	1966	Hilltop above Lake Fulmor (Thorne)	RIV

*(RSA)	U	1999	Idyllwild Area: near Idyllwild Community Service Dist. sewage ponds at terminus of FRS24.2. 4700-4800'. Uncommon in partial shade beneath <i>Quercus chrysolepis</i> , <i>Pinus coulteri</i> . Mixed evergreen forest (<i>Pinus</i> spp., <i>Quercus</i> spp.) on N-facing slopes; chaparral (<i>Adenostoma</i> , <i>Ceanothus</i> , etc.) on S-facing slopes. Much of area in use for wastewater disposal by sprinklers. This area is densely covered by <i>Bromus tectorum</i> . Private land.	RIV
*	1260 stems	2003	South of Fuller Mill Picnic Area in Lewler Park, T4S, R2E, S26. Light foot trail alongside creek but Lawler Park closed to public. <i>Bromus tectorum</i> (scarce), recreational land use near Fuller Mill Creek Picnic Area. (Soza/RSA FS surveys) Survey occurred on NFS land but plants located on private land.	RIV
*	5400 stems	2003	Black Mt Rd (4S01) from 0.9 mi above junction of 4S01 and 4S02 to 2 mi above junction. FS road maintenance, broken glass, trees marked to be cut on slope below road. <i>Bromus tectorum</i> and <i>Vulpia myuros</i> . T4S, R2E, S14, 23 (Soza/RSA FS surveys) SBNF	RIV

*	3500 stems	2003	Lake Fulmor Rd alongside NW side of lake and trail, also alongside east" side of lake. T4S, R2W, S21. Disturbance=dirt road on NW side of lake, recreational use and development around lake/facilities. <i>Bromus tectorum</i> present. (Soza / RSA FS surveys) SBNF	RIV
*(at #3 EO location for <i>Galium californicum</i> ssp <i>primum</i>)	U	2004	Red Hill Road, 0.9 mi. north of Alvin Meadows. Near fuelbreak, clearing of trees has greatly disturbed understory. (Fraga/RSA FS surveys) SBNF	RIV

- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *RIV = Riverside County*

Threats

Three occurrences are found near campgrounds or picnic areas on the San Bernardino National Forest; some of the habitat is adjacent to the urban interface. *Galium angustifolium* ssp. *jacinticum* is affected by trampling, hazard tree removal and the potential for fuels treatments within Wildland Interface defense and threat zones, road maintenance, non-native species, and high levels of recreation use, particularly from vehicle use off classified roads (Stephenson and Calcarone 1999).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Galium angustifolium* ssp. *jacinticum*:

- Reduce effects noted to the *Galium angustifolium* ssp. *jacinticum* occurrences during the 2003 surveys in the Lake Fulmor/Black Mountain area.
- Write and implement a species management guide for *Galium angustifolium* ssp. *jacinticum*
- Survey all new occurrences of *Galium angustifolium* ssp. *jacinticum* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Galium angustifolium* ssp. *jacinticum* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been

documented in at least ten years prior.

- Map known and new occurrences of *Galium angustifolium* ssp. *jacinticum* in the Province using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.
- Monitor locations affected by vegetation management in the Red Hill area to assist in future management within habitat.

Evaluation of Current Situation and Threats on National Forest System Lands

Recent botanical surveys of two occurrences on NFS lands performed by Rancho Santa Ana Botanical Garden Staff ranked occurrence quality, condition, viability, and defensibility as "marginal" at the Lake Fulmor occurrence, and "good" at the Black Mountain Road occurrence. Surveyors indicated that in both the Lawyer Park and the Black Mt. Road locations, there is potential for more plants to occur in the vicinity (USDA Forest Service 2003). It is not known at this time the extent of threats to other occurrences or what effect fuels treatments will have on habitat over the long-term.

Based on this analysis and that the plants are endemic to a small area, *Galium angustifolium* ssp. *jacinticum* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	B	B	C	A

Galium angustifolium ssp. *jacinticum* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Under all alternatives the Lake Fulmor occurrences are present within the established Black Mountain Special Interest Area. Under Alternatives 2-6, Standard S33 would provide a higher level of protection during environmental analysis for new projects within the SIA. Plants may also be present (RSA 1969 herbarium record) in the established Hall Canyon Research Natural Area under all alternatives. The majority of locations are zoned Developed Area Intermix and Back Country under all alternatives. Two occurrences in Alternative 4a are zoned Back Country Motorized Use Restricted; several in Alternative 6 are zoned Back Country Non-Motorized. A higher level of protection would occur under Alternatives

2, 3, 4, 4a, and 6 as Critical Biological zoning and an eligible Wild and Scenic River designation are recommended. Increased acreage of Critical Biological zoning in Alternatives 4a and 6 would provide the highest level of protection over the long-term.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	B	B	C	A

As per current records, the Lawler Creek occurrence on private land is of good quality, with excellent habitat condition, excellent long term prospects for continued existence, good defensibility and has an overall "good" ranking at this site (USDA Forest Service 2003). There is a light foot trail along side the creek but the area is closed to the public. The population status of the occurrence near Idyllwild Community Service District sewage ponds at terminus of FRS24.2 is unknown at this time. This occurrence is 3.5 miles south of the other known locations. By maintaining the current distribution of *Galium angustifolium* ssp. *jacinticum* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this species to suffer a decline in its overall distribution.

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Galium angustifolium ssp. gabrielense	Galium californicum ssp. primum
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Galium californicum* ssp. *primum

Galium californicum Hook. & Arn. ssp. *primum* Dempster & Stebbins (California bedstraw)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T1; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Galium californicum ssp. *primum* is endemic to the San Jacinto Mountains. It was known from four known locations, three of which are on the SBNF and one of which was on private land (California Natural Diversity Database 2004). There is also a fifth unverified occurrence from San Timoteo Canyon, west of Beaumont, in Riverside County (Dudek & Associates 2000).

Distribution in the Planning Area

Three occurrences of *Galium californicum* ssp. *primum* are known from habitat surrounding Alvin Meadows in the southern San Jacinto Mountains west of Idyllwild (California Natural Diversity Database 2004). Voucher specimens collected by the Forest Botanist from the Alvin Meadows area in 1992 were confirmed by Dempster to be *Galium californicum* ssp. *primum*. Fifteen additional occurrences were located in the Alvin Meadows area by a student volunteer working for the USDA Forest Service in 1996, although positive species identification has not been made for these records. Additional occurrences of *Galium californicum* ssp. *primum* were recorded near Alvin Meadows in September 1996 following the Bee Fire (USDA Forest Service 1998a) and during follow-up surveys in April 1997. During these surveys, a total of eight occurrences were located, but some of these may be small occurrences within previously known populations.

Taxonomy and Natural History

Galium californicum ssp. *primum* is a dicotyledonous perennial herb that has a low, weak, slender, and

loosely-tufted appearance. The taxon is not woody and has more or less sparse and soft hairs. Stem length is between 9-13 cm. Leaves occur in whorls of 4 and are petioled, elliptic, have acute to round tips, and are each 4-12 mm long. Plants are dioecious. Staminate inflorescences occur in clusters, each with a few flowers. Pistillate flowers are generally solitary in axils. Corollas on flowers are rotate and yellowish, and fruits are (Dempster 1993). Flowering occurs May through July (Munz 1974).

The dioecious nature of *Galium californicum* ssp. *primum* makes occurrences vulnerable to extirpation if staminate or pistillate plants within an occurrence are lost. Therefore, staminate and pistillate individuals within each population should be maintained for reproduction and the conservation of genetic diversity.

Galium californicum ssp. *primum* appears to be closely related to *Galium nuttallii* (San Diego bedstraw), and the taxa overlap in range. Both taxa have the same chromosome number ($2n = 22$), and there is evidence that they form hybrid swarms within occurrences. Hybrids have been reported from two of the three known occurrences on National Forest System lands (USDA Forest Service 2002).

Habitat Description

Galium californicum ssp. *primum* occurs in the understory of conifer forests and chaparral and at the ecotone of these two habitats. The taxon typically occurs in shaded sites on granitic and sandy soil at elevations of 4,400 – 5,600 feet (Hickman 1993). However, the plant has been identified growing in sun in the area burned in the 1996 Bee Fire (USDA Forest Service 1998a).

Suitable habitat for *Galium californicum* ssp. *primum* is presumed to be stable, although the effects of target shooting, fuelwood collection, dispersed recreation and effects of vehicle use off classified roads are unknown. The 1996 Bee Fire and a subsequent salvage sale both occurred within the range of the species, but it is unknown to what extent these disturbances have affected occurrences (USDA Forest Service 1998b). *Bromus tectorum* is known to occur within occurrences within or adjacent to the Bee Fire.

Occurrence Status

All four documented occurrences of *Galium californicum* ssp. *primum* appear to be affected by some degree of hybridization with *Galium nuttallii*, and the taxon is considered to be declining as a result. CNDDDB records (2004) for the occurrences on Red Hill Road (occ. no. 3) and at Chimney Flat (occ. no. 4) both report that these occurrences are "part of a hybrid swarm" with *Galium nuttallii*. Parish's 1891 occurrence at Reche Canyon on private land (occ. no. 2) was not relocated in 1967, and it is possible that this occurrence has been extirpated due to total "genetic swamping" by *Galium nuttallii* (California Natural Diversity Database 2004).

Although a multiyear, post fire monitoring effort for this species was not conducted after the 1996 Bee Fire, vegetative re-growth was observed on some burned individuals of *Galium californicum* ssp.

primum by Volgarino in April 1997. Regeneration from seed was not observed in the first year following fire; whether it occurred later is not known at this time. There is a possibility the seed bank may have burned if it was present in the heavy accumulation of leaf litter burned in the fire. Other unknown factors may have also contributed to the absence of regeneration by seed (USDA Forest Service 1998a) in the first year following the fire.

The following table shows the number of occurrences recorded in the literature and in Forest Service records, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Galium californicum* ssp. *primum* (California bedstraw)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U 42	1965 2004	On road to Alvin Meadows from Idyllwild. (Fraga/RSA FS 2004 surveys) SBNF	RIV
2	U	1891,1967	Reche Canyon (South of San Bernardino). PVT	RIV, SBD
3	U 400 42	1966 2004 2004	Red Hill Road, 0.9 mi. north of Alvin Meadows. Near fuelbreak, clearing of trees has greatly disturbed understory. (Fraga/RSA FS 2004 surveys) SBNF On Chimney flat Rd. 9S06) near intersection of 5S04 (the road to Alvin Meadows)	RIV

<p>4</p> <p>202673 (RSA)</p>	<p>U</p> <p>480</p> <p>U</p>	<p>1966 1981</p> <p>2004</p> <p>1966</p>	<p>Chimney Flat (Old Control Road) below Alvin Meadows. (Fraga/RSA FS 2004 surveys) SBNF</p> <p>Chimney Flat Rd. below Alvin Meadows, San Jacinto Mountains, alt. 4600 ft. (Dempster/RSA)</p>	<p>RIV</p>
<p>*</p>	<p>50-100</p>	<p>1996 1997</p>	<p>T5S, R2E, S15 NE1/4. N side of Forest Rd 5S06.2 approx. 1000 ft west of junction with Forest Rd 5S01.1. Within this area, there are 4 occurrences, 2 that did not burn in 1996 Bee fire and 2 that burned and resprouted. Salvage sale occurred here in 1999, occurrences and habitat to be protected from effects of sale, pile burning and replanting and barricaded after use to off road driving but status not known at this time. Portion of the area may be included in designated target shooting area. Resurvey of effects to this species from Bee Fire and salvage sale is needed. A stolen car was dumped and stripped on this site in April 1997. (Kopp) SBNF</p>	<p>RIV</p>

*	U	1992 1996 1997	Alvin Meadows area, just south of gate at junction of 5S06.1 and 5S04. T5S,R2E, S15, NE of NE1/4. One previously known occurrence resprouted after 1996 Bee fire and one small adjacent occurrence found unburned, salvage sale boundary moved to protect these occurrences. Two additional occurrences in this vicinity were not relocated after the fire but were not within the salvage boundary. Lardner collected voucher specimens in Alvin Meadows area in 1992. This location excluded from designated area for dispersed target shooting in 1998. (Kopp) SBNF	RIV
*	U	1966 1999	North of Alvin Meadows, T5S, R2E, S 10. These are the Red Hill occurrences observed in 1966. They burned in the 1996 Bee Fire but were not included in salvage sales after the fire, however potential habitat was included in the Red Hill Salvage unit, west of known occurrences. One of these locations was described in 1996 as potential hybrid. (Kopp) SBNF	RIV
*	1	1996	T5S, R2E, S15, SE1/4. 1 plant on N side of 5S24 beneath Coulter pine, 0.1 mi W of gate on 5S10. Probably more plants but area not surveyed. Plant appeared to be hybrid in 1996 survey (Kopp) SBNF	SBNF

- *U = Unknown*
- ** = an occurrence number has not been assigned*

- *SBNF* = San Bernardino National Forest
- *SBD* = San Bernardino County
- *RIV* = Riverside County

Threats

Decline from some level of hybridization may be the greatest threat. Three occurrences were visited in 2004 by Rancho Santa Ana Garden Staff, of these, introgression between *Galium californicum* ssp. *primum* and *Galium porrigens* was observed at all three sites. Only one of the three locations had plants that seemed “pure” *Galium californicum* ssp. *primum* (USDA Forest Service 2004 RSA element occurrence forms 2004). A suggestion has been made recently that the taxonomic basis for *Galium californicum* ssp. *primum* may be questionable (White, undated). More study is needed.

Up until 1998, the entire range of *Galium californicum* ssp. *primum* on NFS land fell within a dispersed area for public target shooting, which may have lead to habitat degradation via trampling, trash accumulation, weed establishment and the potential for increased fire (USDA Forest Service 2002). However ¾ of the known habitat for this species and all of the Alvin Meadow occurrences were eliminated from the area open for target shooting in 1998 (Lardner pers. comm.). The Alvin Meadows horse pasture is under special use permit within the habitat; however it receives low use (Lardner pers. comm.). Other threats to the taxon include dispersed recreational use and unauthorized vehicle use off classified roads and possible clearing of future dead hazard trees. The potential for frequent fire, presence of cheatgrass in habitat and unauthorized dumping are also threats.

In recent years, two projects have occurred in potential habitat for this species; the Pine Cove Fuelbreak and the Redhill Hazard fuel Reduction Project. Both projects locations were north of the known habitat and no plants were observed during surveys.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Galium californicum* ssp. *primum*:

- Compile information on the 2004 RSA survey data of this taxon. Decide threat level and recommend protective actions if necessary. Secure funding for additional scientific study of this species to determine significance of potential threats from hybridization, land use impacts and to create an up to date map of extant occurrences for future management.
- Survey all new occurrences of *Galium californicum* ssp. *primum* and any occurrences that have not been visited in the past ten years to confirm identification, record occurrence status, habitat condition, and threats. Specifically, determine if target shooting or the use of the Webster Trail in S. 10 is affecting habitat. Develop avoidance measures if use is determined to cause negative effects. Survey suitable habitat for new occurrences within range of existing populations.
- Monitor the low intensity post fire effect on occurrences burned in the 1996 Bee Fire and the

effects of the Bee Salvage Sale and public fuelwood collection within the sale boundary on plant habitat. Ensure barriers were installed on the N side of 5S06.2 to prevent off road driving on skid trails through habitat.

- Protect habitat for *Galium californicum* ssp. *primum* from fire suppression activities to the maximum extent possible.
- Determine if mortality tree removal, fuelwood cutting or fuelbreaks affect habitat.
- Identify hybrid individuals within known occurrences and determine the extent of genetic swamping occurring between *Galium californicum* ssp. *primum* and *Galium nuttallii*. Determine the status of CNDDDB occ. no. 2.
- Collect a herbarium voucher specimen of *Galium californicum* ssp. *primum* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Galium californicum* ssp. *primum* in the planning area using SBNF data collection standards, and incorporate these occurrences into the GIS database.
- Educate SBNF personnel on the San Jacinto District in Idyllwild regarding the locations of this plant to promote monitoring and protection of habitat.

Evaluation of Current Situation and Threats on National Forest System Lands

This plant was proposed for federal listing in 1980 (Derby 1980). The reason to not formally list at that time is not known, however it may have been based on protection measures secured on NFS lands. Twenty five years later, all of the occurrences for this plant occur on NFS lands are known within a smaller land base than many of the Forest's currently Federally listed species and the threats appear to be as great as those which warrant federal protection. However, the significance of a number of threats to this species, especially that of hybridization, remain unknown. Effects of hybridization have been documented but not thoroughly investigated in recent years. The majority of the known occurrences burned in the Bee Fire within the last 9 years and a salvage sale was conducted in a portion of the habitat. Target shooting is allowed on ¼ of the habitat. Dispersed camping, fuelwood collection, and unauthorized activities occur in the habitat. There is also a high possibility that trees killed in the 2003 drought will need to be removed in *Galium californicum* ssp. *primum* habitat (Lardner pers comm.). *Bromus tectorum* is also present within occupied *Galium californicum* var. *primum* habitat.

Because of these impacts, the inherent threat of poor knowledge of these impacts, and because the viability of this species is tied to NFS land management, *Galium californicum* ssp. *primum* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	D	C

Galium californicum ssp. *primum* is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Habitat in all alternatives except 3, 4a and 6 is zoned as Back Country. Habitat within Alternatives 3, 4a and 6 are a combination of Back Country and Back Country Non-motorized zoning. Under Alternative 4a, one road is zoned Back Country Motorized Use Restricted. Target shooting in ¼ of the known habitat would be allowed in all alternatives. Three occurrences were visited in 2004 by Rancho Santa Ana Garden Staff, of these, introgression between *Galium californicum* ssp. *primum* and *Galium porrigens* was observed at all three sites. Only one of the three locations had plants that seemed “pure” *Galium californicum* ssp. *primum* (USDA Forest Service 2004). A suggestion has been made recently that the taxonomic basis for *Galium californicum* ssp. *primum* may be questionable (White, undated).

However at this time population status and significance of effects to habitat are unknown, and there are no protection measures in place to sustain habitat, making occurrences of *Galium californicum* ssp. *primum* at risk from Forest Service activities and hybridization. Back Country Non-Motorized zoning is the highest level of protection this taxon is afforded under all alternatives. There are no recommendations for Special Area designations that would increase habitat protection in any of the known locations in any of the alternatives. The viability outcome under Alternative 5 was lower based on the level of ongoing recreational activities within this small range of habitat, and the increased emphasis on motorized use and habitat mitigation verses habitat protection in this alternative.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	D	C

The San Timoteo Canyon occurrence, if it was present, is most likely no longer extant. This area is private land that has been type converted from frequent fire (Eliason pers. comm.). At the current time, USFS botanists are unsure of this occurrence location, as there is no record in the UC Riverside herbarium database or the California Natural Diversity Data Base (CNDDDB) for the San Timoteo Canyon occurrence. One possibility is that it was taken from the CNDDDB map which could have included the San Timoteo Canyon in the Reche Canyon polygon (Lardner pers. comm.). The Reche

Canyon occurrence was last seen by Parish in 1891. This area has been typed converted from fire and has been developed into ranches where grazing occurs. Therefore, at the current time, all occurrences are found on NFS lands therefore predicted outcomes are the same. By maintaining the current distribution of this taxon on NFS lands under Alternatives 1-4a, and 6, only the motorized land use zoning and alternative emphasis in Alternative 5 could contribute to cumulative effects that would cause this taxon to suffer a decline in its overall distribution from Forest Service activities. These factors contributed to the D outcome in Alternative 5.

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Galium angustifolium ssp.
jacinticum

Galium californicum ssp.
luciense

Galium californicum ssp. luciense

Galium californicum H. & A. ssp. *luciense* Dempster & Stebbins (Cone Peak bedstraw)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T2, S2.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Galium californicum ssp. *luciense* is endemic to the northern Santa Lucia Range in Monterey County, occurring from Ventana Double Cone south to Silver Peak and Lion Peak and is known from ten confirmed locations.

Distribution in the Planning Area

Galium californicum ssp. *luciense* occurs on the Monterey Ranger District at the following locations: along the Ventana Trail from Ventana Double Cone Lookout extending to the north for about one mile [California Natural Diversity Database (CNDDDB) Occurrence #2]; at Cone Peak and vicinity (CNDDDB Occurrence #3); at Gamboa Trail at saddle near Twin Peak (CNDDDB Occurrence #5); on the Cruickshank Trail at about 2,900-3,000 feet in the Villa Creek watershed (CNDDDB Occurrence #4); and north of Cold Springs Camp on Logwood Summit (CNDDDB Occurrence # 1).] CNDDDB Occurrences #3 and #5 are in very close proximity to one another and could be considered a single occurrence. There is also an occurrence on the ridge between Mill and Alder Creeks on the Los Padres National Forest (Painter 2004). The type of *Galium californicum* ssp. *luciense* was collected from Cone Peak on the Los Padres National Forest (Painter 2004).

Galium californicum ssp. *luciense* is documented from from Los Padres National Forest/ Fort Hunter Liggett interface by specimens collected during the Fort Hunter Liggett floristic survey (Painter 2004).

Taxonomy and Natural History

Galium californicum ssp. *luciense* is a dicot in the bedstraw family (Rubiaceae). The genus *Galium* is represented by approximately 40 species in California, many with several subspecies. Seven subspecies are recognized for *Galium californicum* (Dempster 1979, Dempster 1993), occurring widely throughout California. Three subspecies in addition to *Galium californicum* ssp. *luciense* are classified as uncommon to rare (California Native Plant Society 2001). Of the three subspecies occurring in the outer south Coast Ranges, *Galium californicum* ssp. *luciense* is distinguished by slender stems, which are not woody or are only woody at the base; herbage without prickles; and short leaves (less than 0.25 inch [6 mm]) that are more or less fleshy with an abrupt petiole and acute, but not sharp, tip.

Galium californicum ssp. *luciense* is a perennial herb with rhizomatous roots that annually produce shoots, these shoots forming a low spreading mat to 6 inches (1.5 dm) tall and up to several square feet in extent. *Galium californicum* ssp. *luciense* is dioecious and the yellow-to-green flowers bloom from March to July, sometimes as late as September. The leaves are in whorls of 4, elliptic or obovate, and 4-6 mm long. The fruit, which is a berry, is white and fleshy when mature and black when dry.

Associates include *Pinus lambertiana*, *Quercus wislizenii*, *Umbellularia californica*, *Arctostaphylos hooveri*, *A. glandulosa*, *Adenostoma glandulosa*, *Ceanothus papillosus*, *Pinus coulteri*, and *P. attenuata*.

Habitat Description

Galium californicum ssp. *luciense* is found growing on gravelly talus or duff within chaparral, broad-leaved upland forest, cismontane woodland, and conifer forest habitats, usually in partial shade at elevations of 1,312-5,000 feet (400-1,525 meters) (California Natural Diversity Database 2004, California Native Plant Society 2001, Wilken pers. comm.). Some populations occur on serpentine or sandstone substrates (Wilken pers. comm.).

Occurrence Status

Galium californicum ssp. *luciense* is distributed in 10 highly restricted occurrences, but is not currently considered vulnerable to extinction (California Native Plant Society 2001). Population trends are considered to be stable.

Threats

There are no known threats to this taxon from activities on National Forest System land. All of the known occurrences on the Los Padres National Forest are within designated wilderness. In addition, occurrences #3 and #5 are within or partly within the Cone Peak Gradient Research Natural Area and Occurrence #4 is partly within the Lion Den Springs Botanical Special Interest Area.

Conservation and Management Considerations

Field surveys are needed to determine the current status of the populations on the Los Padres National Forest, which have not been documented since the 1970s (California Natural Diversity Database 2004), and to search for additional occurrences. Sex ratios of occurrences should be determined in order to identify any potential demographic bottlenecks. Staminate and pistillate individuals should be maintained for reproduction and the conservation of genetic diversity (Painter 2004). The remaining sites are all on Fort Hunter Liggett Military Reservation, and some may be vulnerable to road maintenance activities or resumption of grazing (California Natural Diversity Database 2004). One occurrence on Fort Hunter Liggett Military Reservation was partially buried by road grading activities, but plants were able to persist.

Evaluation of Current Situation and Threats on National Forest System Lands

Galium californicum ssp. *luciense* is a narrow endemic that is restricted to the northern Santa Lucia Mountains in areas that are largely designated Wilderness. There are no known threats to this taxon from activities on National Forest System land.

Based upon the above analysis *Galium californicum* ssp. *luciense* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Galium californicum ssp. *luciense* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Galium californicum* ssp. *luciense* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Galium californicum* ssp. *luciense* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Galium californicum ssp.
primum**

Galium clementis

Galium clementis

Galium clementis Eastwood (Santa Lucia bedstraw)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G2, S2.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Galium clementis is endemic to the Santa Lucia Mountains (Dempster 1993) of Monterey County.

Distribution in the Planning Area

Galium clementis is known from seven locations in the Ventana and Silver Peak Wilderness Areas, all of which are on the Monterey Ranger District of the Los Padres National Forest (Rogers 1999). Occurrences are known from Ventana Double Cone, Junipero Serra Peak (Painter 2004), Black Butte, Cone Peak (eight occurrences according to Painter 2004), Cruickshank Trail below Lion Den Campground, Pinyon Peak, and Los Burros (CalFlora 2002). Field surveys in 2002 (Delgado) resulted in the discovery of a new location for *Galium clementis* on Black Cone Trail. The type of *Galium clementis* was collected from Juipero Serra Peak on the Los Padres National Forest (Painter 2004).

Taxonomy and Natural History

Galium clementis is a dicot in the madder family (Rubiaceae). Many madder species are present in the Santa Lucia Mountains; *Galium clementis* is distinguished by the narrow leaves with inrolled margins that are usually in whorls of four; the hairy fruits; and the presence of herbaceous, rather than woody, stems (Rogers 1999).

Galium clementis is a perennial herb that blooms May–July (California Native Plant Society 2001).

The plants are dioecious, producing staminate and pistillate flowers on separate plants (Dempster 1993).

In the event of disturbance by wildfire, *Galium clementis* responds by producing new shoots from surviving root crowns, though, for the most part, *Galium clementis* is an avoider, occupying habitats that have very low fire frequencies owing to their steep slopes and low surface fuel accumulations.

Habitat Description

Galium clementis occurs on rocky soils derived from granite or serpentinite in montane coniferous forest at elevations of 3,700–5,840 feet (1,130–1,780 meters) (California Native Plant Society 2001). *Galium clementis* is sometimes found growing with *Galium californicum* ssp. *luciense* or *Galium hardhamiae*. In describing the vegetation that is associated with *Abies bracteata*, Talley (1974) reported that *Galium clementis* is often found with *Abies bracteata* over the tree's entire range of habitats, from exposed south-facing cliffs to beneath closed stands of *Quercus chrysolepis* and *Lithocarpus densiflorus*.

Occurrence Status

No information is available on the status and trends of *Galium clementis* populations on National Forest System lands.

Threats

No information is available on threats to *Galium clementis*. Because all known populations of this species occur in Wilderness areas, the populations are likely to be relatively secure from human disturbance.

Conservation and Management Considerations

More information is needed about population status and management considerations for *Galium clementis*.

Evaluation of Current Situation and Threats on National Forest System Lands

Galium clementis is a narrow endemic found only in the Santa Lucia Mountains of southern Monterey County. Despite its restricted range, habitat for *Galium clementis* appears to be stable and in good condition and no changes in habitat conditions are anticipated to occur as a result of implementing any of the proposed alternatives.

Based upon the above analysis *Galium clementis* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no

substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Galium clementis* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Galium clementis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Galium californicum ssp. luciense	Galium grande
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Galium grande

Galium grande McClat. (San Gabriel bedstraw)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G1 S1.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Galium grande is endemic to Los Angeles County in the San Gabriel Mountains (Dempster 1993), and possibly the Liebre Mountains. The California Natural Diversity Database (2004) lists occurrences near Chantry Flat and Sand, Sawpit, Monrovia, and Fish Canyons. There is a historic record from the Liebre Mountains northeast of Castaic (CNDDDB #2), but no recent surveys of this area have located this occurrence.

Distribution in the Planning Area

This species is endemic to the Planning Area. Eight of the nine recorded *Galium grande* occurrences are on the Angeles National Forest (California Natural Diversity Database 2004).

Taxonomy and Natural History

Galium grande is a dicot in the madder family (Rubiaceae). It is distinguished from similar species by geographic range and by stem, leaf, and fruit characteristics (Dempster 1993).

Galium grande is a deciduous shrub that blooms January–July (California Native Plant Society 2001).

Habitat Description

Galium grande occupies chaparral, open broad-leaved upland forests, cismontane woodlands, and lower

montane conifer forests at elevations of 1,400-5,000 feet (425–1,525 meters) (California Native Plant Society 2001).

Occurrence Status

Galium grande is distributed in several highly restricted occurrences but currently is not considered to be at immediate risk of extinction (California Native Plant Society 2001). Population trends on National Forest System lands are unknown. Other than the historic record from near Castaic, recorded occurrences are limited to the foothills of the San Gabriel Mountains above Sierra Madre, Monrovia and Azusa. All occurrences are small (a few individuals or at most a few isolated patches), and all are near roads, trails, and/or fuel breaks.

OCCURRENCE DATA – *Galium grande* (San Gabriel Bedstraw)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	< 100 in 1985	2000	0.2 MILE FROM GATE ON RD 2N41 AT CHANTRY FLAT. ALSO NEAR UPPER WINTER CR TRAILHEAD, SAN GABRIEL MOUNTAINS. ANF	LA
2	U	U	SOUTH OF ELIZABETH LAKE GUARD STATION, NORTHEAST OF CASTAIC. ANF	LA
3	U	1910	SAWPIT CANYON, MONROVIA, BASE OF SAN GABRIEL MOUNTAINS. PRIV.	LA
4	1 in 2000	2000	RIDGE BETWEEN MONROVIA CANYON AND FISH CANYON, SAN GABRIEL MOUNTAINS. ANF	LA
5	U	1979	MT WILSON, MT WILSON ROAD, AND MOUNT WILSON TRAIL. ANF	LA

6	< 100 in 1985		0.4 AIRMI NORTH OF CHANTRY FLAT ALONG FUELBREAK ABOVE UPPER WINTER CREEK TRAIL, SAN GABRIEL MOUNTAINS. ANF	LA
7	2 in 2000	2000	COLD SPRINGS CANYON, APPROXIMATELY 0.5 AIRMILE SOUTH OF STONE CABIN FLAT. ANF	LA
8	1 in 2000	2002	ALONG SILVER FISH ROAD, BETWEEN ROBERTS CANYON & WATER CANYON, APPROX 0.9 AIRMILE SSW OF SILVER MOUNTAIN. ANF	LA
9	3 in 1999	1999	LITTLE SANTA ANITA CANYON, ALONG MT WILSON TRAIL, APPROXIMATELY 0.3 AIRMILE SOUTH OF LOOKOUT POINT. ANF	LA

Threats

The one population on private land (within the Angeles National Forest boundary) is on a Boy Scout Camp property and is subject to heavy disturbance (California Natural Diversity Database 2004). Trail and road use and maintenance may pose threats to all known occurrences. Firebreak maintenance may also affect populations on National Forest System lands (California Natural Diversity Database 2004). All known occurrences are in general areas where Wildland Urban Interface fuels and vegetation treatments are likely to occur.

Conservation and Management Considerations

All proposed fuels and vegetation management projects in the area of recorded occurrences should include focused surveys for this species. The following is a list of conservation practices that should be considered for *Galium grande*:

- Collect a herbarium voucher specimen of *Galium grande* to document any new or historical occurrences, or if the occurrence is not known to have been documented in the past ten years.
- Map known and new occurrences of *Galium grande* in the planning area using NRIS data

collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Based upon the above analysis, *Galium grande* has been assigned the following threat category:

- 5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	D	C

Galium grande is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Since the greatest threats to this species are associated with fuels treatments which do not vary across alternatives, differences are small. Alternatives 4, 4a, and 5 have a greater emphasis on increasing levels of recreational use, which may result in increased trail use, maintenance and construction in this species habitat. However, the increased emphasis on monitoring and adaptive management of recreation in Alternative 4 and 4a counteracts this threat to some extent. A higher increase in motorized use and effects from this use would occur under Alternative 5. Consideration of the Standard restricting vehicle travel to designated Forest Transportation System roads and trails, along with the Standards for use and maintenance of roads and trails factor into these outcomes.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	D	C

All but one known occurrence of this species are on the Angeles National Forest, therefore viability of this species across its range is tied to Forest Service management. By maintaining the current distribution of *Galium grande* on National Forest System lands under Alternatives 1-4a and 6, only Alternative 5 would be expected to contribute substantial adverse cumulative effects that would cause *Galium grande* to suffer a decline in its overall distribution. While it is possible that continued impacts to the one private land occurrence could lead to its extirpation (which could result in determinations of D for all alternatives), the viability of the species range-wide hinges on Forest Service management to the extent that the range-wide outcomes echo the Forest System lands outcomes.

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Galium clementis

Galium hardhamiae

Galium hardhamiae

Galium hardhamiae Dempster (Hardham's bedstraw)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G5T2 S2.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Galium hardhamiae is endemic to the Santa Lucia Ranges in Monterey and San Luis Obispo counties (Dempster 1993, California Native Plant Society 2001). The California Natural Diversity Database (2004) lists 23 occurrences.

Distribution in the Planning Area

Nine *Galium hardhamiae* occurrences, covering about 221 acres (89.4 hectares), are mapped within the Los Padres National Forest (Stephenson and Calcarone 1999). These include occurrences on the seaward side of the Santa Lucia Mountains at the south fork of Alder Creek and along upper Alder Creek, at the north fork and headwaters of Villa Creek, in upper Salmon Creek, along the southern terminus of the South Coast Range Road (Forest Service Road 20S05), along the Dutra Trail, along Chris Flood Creek, along San Carpoforo Creek (Painter 2004) and on Cypress Mountain in San Luis Obispo County (California Natural Diversity Database 2004, Hoover 1970). At Lion Mountain, *Galium hardhamiae* is found growing with *Galium clementis*. It also occurs at Fort Hunter Liggett by several specimens collected during the Fort Hunter Liggett floristic survey (Painter 2004). The type of *Galium hardhamiae* was collected from the southern ultimate fork of Alder Creek on the Los Padres National Forest (Painter 2004).

Taxonomy and Natural History

Galium hardhamiae is a dicot in the madder family (Rubiaceae). *Galium hardhamiae* is a perennial,

loosely matted plant with unisexual flowers. The leaves are revolute and in whorls of six, which distinguishes it from other bedstraws in the Santa Lucia Mountains (Dempster 1993, Matthews 1997).

Galium hardhamiae is a perennial herb that blooms April–October (California Native Plant Society 2001).

Habitat Description

Galium hardhamiae occurs on serpentine soils in closed-cone coniferous forest and chaparral, at elevations of 1,270–3,170 feet (390–975 meters) (California Native Plant Society 2001). It occurs primarily with Sargent cypress forest and to a lesser degree in openings within serpentine chaparral where there are no cypress trees (Stephenson and Calcarone 1999).

Occurrence Status

Galium hardhamiae is distributed in a limited number of occurrences but currently is not considered to be at risk of extinction (California Native Plant Society 2001). Population trends for *Galium hardhamiae* on National Forest System lands are considered to be stable.

Threats

Potential threats to populations of *Galium hardhamiae* on National Forest System lands include road maintenance and vegetation management for fuels reduction. However, most occurrences are located within designated Wilderness and are not likely to be subject to active management.

Conservation and Management Considerations

Monitoring populations of *Galium hardhamiae* to determine current distribution and abundance.

Evaluation of Current Situation and Threats on National Forest System Lands

Galium hardhamiae is endemic to the Santa Lucia Mountains and is largely restricted to serpentine soils and areas in and around Sargent Cypress groves. Much of this habitat is within designated Wilderness or botanical special interest areas. These land use designations provide substantial protection for the habitat of this species. There are no ongoing activities that present a threat to the distribution or abundance of *Galium hardhamiae*.

Based upon the above analysis *Galium hardhamiae* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Galium hardhamiae is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Galium hardhamiae* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Galium hardhamiae* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Galium grande

Galium jepsonii

Galium jepsonii

Galium jepsonii Hilend & J. Howell (Jepson's bedstraw)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001) List 4; R-E-D Code 1-1-3

General Distribution

Galium jepsonii occurs in the San Gabriel Mountains of Los Angeles County. There are eleven documented occurrences of the the taxon (CalFlora 2002), and localities include Kratka Ridge east of Mt. Waterman, the Chilao Recreation Area, the north slope of Mt. Waterman, Pacifico Mountain, Roundtop Peak, and Three Points (CalFlora 2002). Two of the eleven records in the CalFlora database (2002) lack location information.

Distribution in the Planning Area

All documented occurrences of *Galium jepsonii* are found in the Arroyo Seco Ranger District of the Angeles National Forest (ANF). Several occurrences are located within or near the Upper Chilao Recreation Area (CalFlora 2002).

Taxonomy and Natural History

Galium jepsonii is an erect, dioecious perennial in the bedstraw family (Rubiaceae). The plant is generally 8-16 cm high and more or less glabrous except for the leaf margin. Stems are in small clumps. Leaves occur in whorls of 4 and are dense near the base and sparse above. Leaves are 6-15 mm long and broadly linear. The inflorescence is a terminal panicle that is more or less leafless and open. The flower corolla is bell-shaped, cream, and divided halfway to the base or less. Lobe tips are often pink. Fruits are nutlets with ascending hairs that are short, curved, and not hooked (Dempster 1993). Flowering typically occurs between July and August (Munz 1974).

Habitat Description

Occurrences of *Galium jepsonii* are found in the upper montane conifer zones of the San Gabriel Mountains (USDA Forest Service 2002). Several records from the CalFlora database (2002) note occurrences on north- or northeast-facing slopes and near the summit of peaks in the San Gabriel Mountains. The plant occupies dry, granitic, rocky, and gravelly places in open woodlands between 7,000 and 8,000 feet in elevation (Dempster 1993).

Occurrence Status

The CalFlora database (2002) lists eleven records for *Galium jepsonii*. Although there are no records currently in the California Natural Diversity Database (California Natural Diversity Database 2004), documentation for five occurrences of the plant have been sent to California Natural Diversity Database for entry. Trends in abundance and distribution are unknown, and all CalFlora records except two are at least 30 years old.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Galium jepsonii* (Jepson's bedstraw)

Occurrence ID No.(CalFlora 2002)	No. of Plants	Year Reported	Location/Land Owner	County
1187167	U	1958	Cedar Spring about 1 mi w; upper slopes of Little Rock Creek Canyon, near base of n-facing side of Kratka Ridge, San Gabriel Mountains. ANF	LA
1633767	U	1971	Unknown location. U	LA
1220281	U	1966	Along Angeles Crest Hwy 2.9 mi above Upper Chilao Recreation Area. ANF	LA
1325812	U	1972	Three Points and Camp Valcrest along Angeles Crest Hwy ca. 1/2 mi. e San Gabriel Mts. ANF	LA

1128496	U	1945	N slope Mt. Waterman, San Gabriel Mts. ANF	LA
1325759	U	1972	NE slope Mt. Waterman, San Gabriel Mts. ANF	LA
1343976	U	1991	Roundtop summit slopes, nw Chilao Flat USGS 7.5' quad, San Gabriel Mountains. ANF	LA
486782	U	U	Unknown location. U	LA
1220291	U	1965	Upper Chilao Recreation Area, Angeles Crest Hwy 3 mi e, San Gabriel Mtns. ANF	LA
1342882	U	1991	Intersection of Pacifico Mountain Road x Roundtop Truck Road near Pacifico Mtn USGS 7.5' quad, Granite Mountain vicinity. ANF	LA
1220289	U	1966	Chilao Recreation Area Angeles Crest Highway ne; Cloudburst Summit ne of Chilao Recreation Area. ANF	LA

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *ANF = Angeles National Forest*
- *LA = Los Angeles County*

Threats

Galium jepsonii is uncommon, and several occurrences are located within high-use recreation areas or near roads. More studies are needed to determine the current distribution of *Galium jepsonii* and its vulnerability to impacts from Forest uses. However, potential threats to occurrences and suitable habitat include recreation activities, mineral extraction operations, trail and road construction and maintenance, and other Forest management activities.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Galium jepsonii*:

- Survey all new occurrences of *Galium jepsonii* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Galium jepsonii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Galium jepsonii* in the planning area using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Galium jepsonii is endemic to the San Gabriel Mountains in southern California. This species is recorded from eleven localities, and additional suitable habitat is present on the Angeles and San Bernardino National Forests. *Galium jepsonii* is found in sufficient numbers and wide enough distribution that the potential for extinction is considered to be low (California Native Plant Society 2001). The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above, there are no known substantial threats to the distribution or persistence of *Galium angustifolium* ssp. *gabrielense*.

Based on the above analysis, this species has been assigned the following risk category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Galium jepsonii is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Galium jepsonii* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Galium jepsonii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Galium jepsonii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon

to suffer a decline in its overall distribution.

Literature Cited

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Galium johnstonii

Galium johnstonii Dempster & Stebbins (Johnston's bedstraw)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3 S3.3 – (California Natural Diversity Database)

California Native Plant Society (2001): List 4, R-E-D Code 1-1-3

General Distribution

Galium johnstonii is endemic to the San Gabriel, San Bernardino, and San Jacinto mountains of Los Angeles, San Bernardino, and Riverside counties (Dempster 1993, Reiser 1994, California Native Plant Society 2001).

Distribution in the Planning Area

Galium johnstonii occurs on the Angeles and San Bernardino national forests. The CalFlora database (2000) contains several records for *Galium johnstonii*, totaling 19 general locations, all of which are on National Forest System lands. Most of these are on the Angeles National Forest. Locations on the Angeles and San Bernardino national forests include the Lytle Creek area, Kilpecker Creek, San Bernardino Peak, Condor Peak, Cloudburst Summit, the Big Pines area, the Chilao Flats Recreational Area, the Granite Mountain area, the Horse Flats Campground area, the summit of Mt. Wilson, Charlton Flats, Strawberry Peak, upper Big Rock Creek, and Santa Rosa Mountain (Reiser 1994, Krantz, et. al. draft 2000, CalFlora 2002). In addition, several specimens of *Galium johnstonii* have been collected from various areas in Los Angeles and San Bernardino counties and are housed at Rancho Santa Ana Botanic Garden. Potential habitat exists in the San Diego ranges, but the taxon has not been documented on the Cleveland National Forest (Reiser 1994, USDA Forest Service 2003).

Taxonomy and Natural History

Galium johnstonii is a dicotyledon in the madder family (Rubiaceae). This perennial herb blooms from June-July (California Native Plant Society 2001).

Galium johnstonii is an erect perennial that is 18-35 cm, dioecious, and glabrous except for the leaf margins. The base is woody. The upper stem internodes are 2-5 times greater than the leaves. The leaves are in whorls of 4, are 14-30 mm, and generally linear. The inflorescence is characterized by a terminal panicle that is more or less leafless and open. The corolla is bell-shaped, divided halfway to the base or less, and cream-colored, often with pink lobed tips. The fruit are nutlets with ascending short, curved, unhooked hairs (Dempster 1993).

Habitat Description

Galium johnstonii occurs on dry rocky slopes in open mixed hardwood and conifer forest and Jeffrey pine forest at elevations of 5,070–7,475 feet (1,550–2,280 meters) (California Native Plant Society 2001). On Santa Rosa Peak, *Galium johnstonii* grows in partial shade beneath conifers (Reiser 1994).

Occurrence Status

Population status and trends for *Galium johnstonii* on National Forest System lands are unknown.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Galium johnstonii* (Johnston's bedstraw)

Occurrence No. (CalFlora/RSA)	No. of Plants	Year Reported	Location/Land Owner	County
CalFlora 1371543, 1255421	U	1917	Head of S. Fork of Lytle Creek, San Antonio Mountains. SBNF.	SBD
CalFlora 1265104	U	1953	San Bernardino Peak. SBNF.	SBD
CalFlora 1342893, 1342923, 1342898, 1342879, 1342899	U	1991	NNE slope Pacifico Mountain USGS 7.5' quadrangle, Granite Mountain. ANF	LA
CalFlora 1344772	U	1992	Condor Peak ridgeline between Iron Mtn and; NW spur or 5162' knoll. San Gabriel Mountains. ANF.	LA

CalFlora 1255432	U	1922	Big Pines N San Gabriel Mtns., Le Montaine. ANF.	LA
CalFlora 1343317	U	1991	Horse Flats; near dry stream depression. San Gabriel Mountains, Chilao Flat. ANF.	LA
CalFlora 1344734	U	1992	76 ° ENE and 900 m distant from Strawberry Peak summit; a few m E of spring. San Gabriel Mtns. Vicinity of Strawberry Spring. ANF.	LA
CalFlora 1187180	U	1958	Charlton Flat close to Angeles Crest Hwy (Hwy 2). ANF.	LA
CalFlora 1248531	U	1989	Lowermost NE-facing slope of canyon; ca. 0.1 km NNW of Icy Springs, 26 km NNE of Glendora, just E of ruins of old stone house. San Gabriel Mountains, canyon of upper Big Rock Creek. ANF.	LA
CalFlora 1220283, 1220287	U	1965	Upper Chilao Recreation Area Angeles Crest Hwy just S. San Gabriel Mtns. ANF.	LA
CalFlora 1344714	U	1990	Northerly draw draining to Jackson Lake. San Gabriel Mountains, Camp Verdug. ANF.	LA
CalFlora 1323337	U	1969	Above Big Pines, S slope of mt. San Gabriel Mtns. Table Mt. ANF.	LA
CalFlora 1323438	U	1969	Upper Chilao Campground. San Gabriel Mtns. ANF.	LA

CalFlora 1220284, 1220286	U	1965	Big Pines 3.5 mi. NW; on road to Valyermo, N side mountains. San Gabriel Mountains.	LA
CalFlora 1331676	U	1902	Summit Mt. Wilson. ANF.	LA
CalFlora 1343967	U	1991	SE slope San Gabriel Mtns. Granite Mountain. ANF.	LA
CalFlora 1220288	U	1965	Upper Chilao Recreation area. Angeles Crest Hwy 2 mi. San Gabriel Mtns. ANF.	LA
CalFlora 1323434	U	1969	Cloudburst Summit along Angeles Crest Hwy 3.2 mi. WSW; SE-facing slope San Gabriel Mtns. ANF.	LA
CalFlora 1343964	U	1991	summit easterly slope just below, San Gabriel Mtns., Chilao Flat USGS 7.5' quad. Roundtop Mtn. ANF.	LA
RSA 2570	U	1990	San Gabriel Mountains. Little Gleason Forestry Plantation: north of Mt Gleason Road about the east headwaters of Gleason Canyon and about 2 (air) miles E of Mt Gleason summit; Acton USGS 7.5' quadrangle; T4N R12W, SW/4 SE/4 section 33; elevation ca. 5520-	LA
RSA 1351	U	1994	Little Rock Creek, un-named drainage draining N slope of Bare Mountain; elev. 5700 ft; Juniper Hills 7.5' USGS topo. quad. ANF.	LA

RSA 1374	U	1994	Santiago Canyon, drainage northwest of Pacifico Mountain. Elev. 6,200 ft. Pacifico Mtn. 7.5' USGS topographic quadrangle: T4N R11W sec. 28. ANF.	LA
RSA 1804	U	1995	Bare Mountain Canyon; elev. 5700 ft; Pacifico Mtn. 7.5' USGS topographic quadrangle T3N R11W sec. 34. ANF.	LA
RSA 3001	U	1994	Eastern San Gabriel Mountains, Deer Canyon, at USFS Road #1N34 (Big Tree Truck Road). (Cucamonga Peak quad: T1N R7W sec.2 SE/16 of NW/4.) Elev. 5000 ft. SBNF.	SBD
RSA 38265	U	1969	Angeles Nat'l forest; along Angeles Crest Hwy, 0.5 miles S of Dawson Saddle; elev. 7800 ft	LA
RSA 1435	U	1994	Big Rock Creek, Sycamore Flat Campground. ANF.	LA
RSA 1438	U	1994	San Gabriel Mountains, Big Rock Creek, Big Rock Campground, around bathroom just N of turnaround at end of campground. ANF.	LA
RSA 5122	U	1925	S slope of Cucamonga Peak, canyon W of Manzanita flats. Cucamonga Wilderness. SBNF.	SBD
RSA 2927	U	1937	Soldiers' Creek, San Gabriel Mountains	LA

RSA 40846	U	1971	San Gabriel Mountains, San Bernardino National Forest: Mouth of Day Canyon, elev. c. 2700 feet.	SBD
RSA	U	1925	Between upper and lower San Sevaine Flats. Elev. 5100 feet. SBNF.	SBD
RSA	U	1968	San Gabriel Mountains: Divide between West Fork Bear Creek & Devils Canyon. T3 N R10 W sec. 32. Elev. 5900 Feet. ANF.	LA

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*
- *RSA = Rancho Santa Ana Botanic Garden*

Threats

More information is needed for this species on National Forest System lands, especially for populations near trails and other areas with high visitor activity. Specific threats to this species have not yet been identified; however, vulnerability of *Galium johnstonii* populations on National Forest System lands appears to be low (USDA Forest Service 2003).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Galium johnstonii*:

- Survey all new occurrences of *Galium johnstonii* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Galium johnstonii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Galium johnstonii* in the planning area using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Galium johnstonii is endemic to the San Gabriel, San Bernardino, and San Jacinto mountains of Los Angeles, San Bernardino, and Riverside counties (Dempster 1993, Reiser 1994, California Native Plant Society 2001). It occurs in 19 general locations on the Angeles and the San Bernardino National Forests where it sometimes locally common, and there is potential habitat on the Cleveland National Forest. Specific threats to this species have not yet been identified; however, vulnerability of *Galium johnstonii* populations on National Forest System lands appears to be low (USDA Forest Service 2003). *Galium johnstonii* is found in sufficient numbers and wide enough distribution that the potential for extinction is also considered to be low (California Native Plant Society 2001). Based on the above analysis, this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Galium johnstonii is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Galium johnstonii* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Galium johnstonii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Galium johnstonii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

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Galium jepsonii

Gentiana fremontii

Gentiana fremontii

Gentiana fremontii Torrey (Moss gentian)

Management Status

Federal: None

California: None

Heritage Rank: G4; S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 3-1-1

General Distribution

Gentiana fremontii occurs in the San Bernardino Mountains of California. Its range extends to New Mexico, Arizona, Utah, Colorado, Wyoming, Montana, and Canada (Pringle 1993; USDA NRCS 2002). Except for small isolated disjunct occurrences in California and Arizona, the distribution follows the Rocky Mountains from New Mexico north through Colorado, Wyoming, Idaho, Alberta, Saskatchewan, Northwest Territory, and Yukon Territory.

Distribution in the Planning Area

The only known occurrence in the planning area is in the San Gorgonio Wilderness of the San Bernardino National Forest at South Fork Meadows. Several collections have been made at South Fork Meadows, but *Gentiana fremontii* is not known to occur anywhere else in California.

Taxonomy and Natural History

Gentiana fremontii is dicotyledon in the gentian family (Gentianaceae). This annual plant has one to several decumbent to erect stems that are 2-10 cm. The leaves are conspicuously white-margined. The basal leaves are 2-13 mm, 1.5-8 mm wide, widely spoon-shaped to round and abruptly pointed. The lower cauline leaves are crowded, less than 6 mm wide, spoon-shaped to oblanceolate. The upper cauline leaves are strongly ascending, less than the internodes, less than 2 mm wide, oblanceolate to linear, and acute. There is a single flower in the inflorescence. The calyx is 4-12 mm with narrowly triangular, acute lobes. The corolla is 7-15 mm with 2.2-4 mm lobes that are white to pale blue. The exterior is often dark blue, ovate, acuminate, has white sinus appendages that are triangular, more or less

entire or jagged-serrate and acute. The seed is wingless (Pringle 1993). *Gentiana fremontii* flowers from June-July (Munz 1974).

Habitat Description

Gentiana fremontii inhabits wet mountain meadows between 2400-2700 m. In 2002, individuals from the occurrence at South Fork Meadows were observed beside a small rivulet. Associated species include *Carex aurea*, *Dodecatheon alpinum*, *Eleocharis* sp., and mosses.

Montane meadows are widely distributed within the planning area, but tend to occupy small areas and narrow corridors. Meadows within the area are threatened by hydrologic alteration and recreational activities.

Occurrence Status

There is only one occurrence (with several records) of *Gentiana fremontii* in California, at South Fork Meadows (aka Slushy Meadow) in the San Gorgonio Wilderness (California Natural Diversity Database 2004).

The following table shows the recorded occurrence in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Gentiana fremontii* (Moss gentian)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1981	South Fork Meadows, along South Fork of the Santa Ana River, San Bernardino Mountains. Open mossy bank w/ <i>Gentiana marelle</i> , <i>G. holopetala</i> , <i>Carex</i> , and grasses. Two colonies mapped along Dry Lake Trail just E of S Fork Meadows. Occurrence also includes collections from 'Slushy Meadows,' [old place name for South Fork Meadow] 'Upper S Fork Santa Ana River,' and 'Dry Lake Canyon.' Threats include heavy foot traffic in the meadow. SBNF-San Gorgonio Wilderness.	SBD

*	U	2002	South Fork Meadows, wet meadow rivulet with <i>Dodecatheon alpinum</i> , <i>Carex aurea</i> , <i>Platanthera leucostachys</i> , <i>Carex marellee</i> , <i>Elerocharis</i> sp. And mosses. T1N, R1E, S26. 7800 ft. June 22. (Hall/Big Bear Ranger Station herbarium).San Gorgonio Wilderness, SBNF.	SBD
314715 (RSA)	U	1982	South Fork Meadows of Santa Ana River and adjacent forest, San Gorgonio Wilderness Area, from Poop-Out Hill parking lot along Flume Trail through meadows and in wet meadows with <i>G. simplex</i> and <i>Gentianella marelle</i> . (Thorne) SBNF	SBD
*	U	1905	Upper meadows, S fork of Santa Ana River in boggy meadows, 8700 ft. (Wilder/UC/Jeps) SBNF	SBD
*	U	1906 1976	South Fork Meadows, upper transition zone (Hall/UC/Jeps) (Davidson/RSA) SBNF	SBD
*	U	1909	South Fork Santa Ana, 8000 ft (Peirson/Uc/Jeps) SBNF	SBD
*	U	1922	South Fork Santa Ana River, wet marsh or bog, 7800 ft, plants occur from this point for several hundred feet elevation. (Peirson/UC/Jeps) SBNF	SBD
*	U	1940	South Fork Santa Ana River, meadows 8000 ft. (Clausen and Trapido/UC/Jeps) SBNF	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBR = San Bernardino County*
- *LA = Los Angeles County*
- *RIV = Riverside County*

Threats

Threats to *Gentiana fremontii* in California include heavy foot traffic and equestrian use in and around South Fork Meadows. This is a popular rest stop along a very popular wilderness trail, and is also a very commonly used water source for hikers and equestrians. Accessing water away from trail crossings may be the most serious threat for this species, because it involves off-trail walking/riding through the very narrow band of occupied habitat.

Conservation and Management Considerations

The primary short-term conservation strategy for *Gentiana fremontii* is to improve the knowledge of its distribution and protect localities where threats are most pronounced. The following is a list of conservation practices that should be considered for this species:

- Survey all new occurrences of *Gentiana fremontii* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Gentiana fremontii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Gentiana fremontii* in the Planning Area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.
- Where this species occurs at/near trails with apparent off-trail impacts in habitat, install protective measures (signs, barriers, etc) as needed to minimize impacts.

Evaluation of Current Situation and Threats on National Forest System Lands

Gentiana fremontii is a rare, narrowly-distributed disjunct, known in California only from the South Fork Meadows area within the San Geronio Wilderness. This sole occurrence is not well protected from identified threats.

Based on the above analysis, *Gentiana fremontii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	D	C

The primary ongoing threats to this species are trail use and management, and associated off-trail use near watercourses.

Under Alternative 1, 2, 3, and 6, this species would be at continued risk from hiking and equestrian impacts to its attractive streamside habitat at approximately current levels. Under Alternatives 4, 4a and 5, an expected increase in trail use and maintenance, increase risks above current levels. However, under Alternatives 4 and 4a, impacts associated with higher levels of expected recreational use could be offset by expected increases in management control and monitoring.

Because this species’ known distribution is restricted to a single area within an existing wilderness area, the effects of land use zoning on this species are identical across all alternatives. Under all alternatives the South Fork of the Santa Ana River would be managed as eligible for Wild and Scenic River designation.

Consideration of the standards related to riparian conservation areas, wilderness, and recreation management factor into these outcomes.

Viability Outcome for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

The status of this species outside of California was not researched in detail, however, the species is listed as rare and imperiled in California, Arizona, Alberta and Saskatchewan. The San Bernardino Mountains

portion of this species range is such an extreme disjunct, there are not expected to be any effects of decline outside California on the persistence of this species here, or vice versa.

By maintaining the current distribution of *Gentiana fremontii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Gentiana fremontii* to suffer a decline in its overall distribution.

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Rancho Santa Ana Botanic Garden Herbarium

USDA, NRCS. 2002. The PLANTS Database, Version 3.5 National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

Galium johnstonii

Geraea viscida

Geraea viscida

Geraea viscida (A. Gray) Blake (Sticky geraea)

Management Status

Federal: None

California: Endangered (California Natural Diversity Database)

Heritage Rank: G3, S2.3? (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 2-1-1

General Distribution

Geraea viscida, Sticky geraea, is known from a number of locations in the border region and desert areas of San Diego and Imperial counties, as well as areas of Baja California, Mexico (e.g., the Sierra Juarez Mountains, Sierra San Borja) (Reiser 1994). Approximately one-half of the known occurrences of *Geraea viscida* are protected on federal and state lands.

Distribution in the Planning Area

Geraea viscida occurs on the Cleveland National Forest (CNF) at the south end of the Laguna Mountains (California Natural Diversity Database 2004).

Taxonomy and Natural History

Geraea viscida is an herbaceous perennial in the sunflower family (Asteraceae) that grows from an underground caudex. The herbage is densely glandular-puberulent and more or less bristly. Stems are several, 3-10 cm, and simple or few-branched. Leaves are 3-9 cm and sessile with ovate to oblong blades having obtuse tips and ear-like basal lobes and entire to dentate margin. Flower heads are discoid (no ray flowers), solitary or several in more or less flat-topped clusters. Involucre is 10-15 mm with narrowly lance-oblong, obtuse, green, densely glandular phyllaries (Clark 1993). Plants flower from May to June (California Native Plant Society 2001).

Habitat Description

Geraea viscida occupies sandy soils in chamise chaparral and appears to be a disturbance-oriented species, appearing in sparsely vegetated areas, along roads, and after burns (Stephenson and Calcarone 1999). It occurs at elevations of approximately 1,500-5,600 feet (450-1,700 meters) (California Native Plant Society 2001).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 34 known occurrences of *Geraea viscida* (California Natural Diversity Database 2004). About half of the occurrences (22) are on Bureau of Land Management lands in southeastern San Diego County. These occurrences record between one to 200 plants per site. The remaining occurrences (23) are on private lands (or unknown ownership) with several of these occurrences needing current verification of population status. Three of the occurrences recorded with unknown ownership are potentially on Cleveland National Forest lands in the Descanso Ranger District. There are no formal documented occurrence record numbers assigned for *Geraea viscida* in the Cleveland NF plant record files. However, notes indicate occurrences at Cameron Fire Station (20 plants), Cottonwood Fire Station, Kitchen Creek Road at an old shooting range, and south of Japutal Station. In addition, one occurrence was recorded for the Buckman Springs area (Cleveland National Forest records).

Threats

Developments on private lands threaten some occurrences. However, development in *Geraea viscida* habitat is limited in the high desert (Reiser 1994).

Threats to possible occurrences on the Cleveland National Forest have not been noted and are largely unknown. Nonnative annual weed invasion by *Bromus* sp. was reported for the Buckman Springs location (Cleveland National Forest records). The target shooting areas along Kitchen Creek Road have been closed, however livestock grazing occurs. A fuelbreak has also been constructed within or near the Kitchen Creek Road sites. The effects of livestock grazing and the fuelbreak are not known, however this taxon appears to occur within disturbed soils.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Geraea viscida*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Verify the occurrences that may be present on NFS lands.

Evaluation of Current Situation and Threats on National Forest Systems Lands

Geraea viscida has been reported from National Forest System lands in a few places on the Cleveland

National Forest. Threats from invasive nonnative species have been noted at only one of these sites. *Geraea viscida* is distributed in a limited number of occurrences but currently is not considered to be at risk of extinction (California Native Plant Society 2001). Population trends for this species appear to be stable (Reiser 1994, USDA Forest Service 1998).

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon on the Cleveland National Forest in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Geraea viscida* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Geraea viscida* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

- California Native Plant Society. 2001. *Inventory of rare and endangered plants of California (Sixth Edition)*. Sacramento, CA: California Native Plant Society.
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Gentiana fremontii

Gilia leptantha ssp. leptantha

Gilia leptantha ssp. leptantha

Gilia leptantha Parish ssp. *leptantha* (San Bernardino gilia)

Management Status

Federal: None

California: None

Heritage Rank: G4T2; S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Gilia leptantha ssp. *leptantha* is endemic to the upper Santa Ana River watershed in the San Bernardino Mountains, San Bernardino County, California (Krantz, et. al. draft 2000, California Native Plant Society 2001). Plants are known from nine locations (California Natural Diversity Database 2004, USDA Forest Service 2003).

Distribution in the Planning Area

Nine occurrences are documented within the San Bernardino National Forest. These occurrences are known predominantly from the upper Santa Ana Watershed. Three were relocated in 2003 (USDA Forest Service 2003) with substantial occupied acres and numbers of individual plants and one new occurrence was found. Three occurrences were not relocated; (occ. no. 7) at the head of Clark's Grade, Mill Creek Canyon Falls (occ. No. 6), and Seven Oaks (Occ. No. 8) were not relocated during the 2003 surveys. The single occurrence (occ. no. 9) near Whiskey Spring on the desert side of the San Bernardino Mountains was annotated in 1957 to *Gilia leptantha* ssp. *transversa* (USDA Forest Service 2003). RSA surveyed this location in 2003 with negative results for *G. leptantha* ssp. *leptantha*.

Taxonomy and Natural History

Gilia leptantha ssp. *leptantha* is a dicotyledon in the phlox family (Polemoniaceae). This annual herb flowers between June-August (California Native Plant Society 2001).

The type specimen is from Seven Oaks (California Natural Diversity Database 2004). The original

description appears in *Zoe* 5(5):74 (1900), and the taxonomic treatment appears in *Aliso* 3(3):234-237 (1956) (California Native Plant Society 2001).

Gilia leptantha has stems that are cobwebby below the middle and glandular above. The leaves are basal in a rosette and are 1-pinnate, cobwebby, with a 1-2 mm wide axis. The leaves are linear with toothed lobes on both sides, and short-pointed or acuminate teeth. The inflorescence is clustered or loose with 2-6 flowers above a bract. The pedicels are unequal and barely spreading. The calyx is slightly glandular or cobwebby in the early part of the flowering period. The corolla tube is yellow or purplish with yellow veins. The throat is generally yellow and the lobes are pink to lavender.

Gilia leptantha ssp. *leptantha* is differentiated from the three other California subspecies by the following characteristics. *Gilia leptantha* ssp. *leptantha* has spreading to erect, 15-45 cm stems. The corolla is 13-23 mm, with the tube being 2-4 times the calyx, narrow, with a flared to narrow throat, and 1-3 mm wide lobes that are narrowly oblong. The longest stamens are longer than the lobes. Fruit are 3-4 mm and ovoid (Day 1993).

Habitat Description and Status

Gilia leptantha ssp. *leptantha* occurs at elevations of 5,000–8,200 feet (1,524–2,499 meters) and inhabits gravelly, rocky or sandy areas and streambanks within montane coniferous forest (Krantz, et. al. draft 2000, California Native Plant Society 2001). *Gilia leptantha* ssp. *leptantha* has been found in association with *Gilia sinuata*, *Penstemon labrosus*, *Astragalus* spp., *Equisetum laevigatum*, *Lotus crassifolius*, *Hymenopappus filifolius*, and *Lupinus excubitus*.

Occurrence Status

Nine occurrences are located on the San Bernardino National Forest. Large numbers of individuals and large acreages of occupied habitat were recorded in 2003. Because *Gilia leptantha* ssp. *leptantha* is an annual, high variation in population size according to climatic conditions is expected. Surveys should take this into account when conducting focused surveys for *Gilia leptantha* ssp. *leptantha*.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Gilia leptantha* ssp. *Leptantha* (San Bernardino gilia)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1	U	1931	Oak Glen. Lower reaches of canyon, in a wash. Plant is 'likely a washdown from higher population source.' Needs fieldwork. Land owner: U.	SBD
2	U U	1976 2002	Cienega Seca Creek. Yellow pine-white fir forest; on dry sandy banks. Collections from 'Cienega Seca Creek' and 'Hwy 38' mapped along length of the creek. Includes 1976 and 1963 collections. In 2002, collected by RSABG at: Cienega Seca Creek. South of Hwy. 38. (Forest Service Meadow survey of 2002). Started at Forest Service Road 2N93 UTM Zone 11, 3780393N, 0520275E. End at a little west of Skyline Group camp. Growing on dry sandy bench along river, in sun. SBNF	SBD
3	U 108,000 78,000 202,300	1924 2003 2003 2003	Fish Creek, San Bernardino Mountains. Sandy ground under pines; dry gravelly slopes. Collections from 'along bank of Fish Creek' and 'Fish Canyon' mapped together. Yellow pine forest; shaded slope and flat below it formed by an abandoned road. w/ <i>Amelanchier utahensis</i> , <i>Astragalus douglasii</i> , <i>Hymenopappus filifolius</i> , <i>Lupinus excubitus</i> . Needs fieldwork. Includes 1905 and 1924 collections. SBNF. Rancho Santa Ana (RSA) Botanic Garden botanists relocated this occurrence in July 2003. Alluvial bench above creek and SW slopes (rocky) in <i>Abies concolor</i> , <i>Pinus jeffreyi</i> forest. On E side of creek/alluvial benches, on west side of creek and east slopes. Approx. 64 acres of occupancy. Disturbance=cut trees, old pack trail along E side of river, plants growing on both sides of trail. Aspen Grove burn. <i>Bromus tectorum</i> present. Overall occurrence/site	SBD

			<p>ranking=excellent(RSA) SBNF Another RSA 2003 relocated occurrence NW of Aspen Grove. 12 acres of occupancy. Disturbances=equestrian use, cut trees, camping, equestrian and pack trail, <i>Bromus tectorum</i>. Overall occurrence/site ranking=excellent (RSA) SBNF</p> <p>Another RSA 2003 relocated occurrence along alluvial bench on E side Fish Creek, E of College Camp, south of Hwy 38. 40 acres of occupied habitat. Disturbances=dirt rd at mouth of canyon, equestrian use, cut trees, camping, trail along bottom of river, GILE growing in roadbed. <i>Bromus tectorum</i>. Overall occurrence/site ranking=excellent (RSA) SBNF</p>	
4	U 1500	1992 2003	<p>Big Meadows, Heart Bar State Park/ SBNF. Dry, gravelly river bottom. Dry sandy banks. w/ <i>Penstemon labrosus</i>, <i>Gutierrezia sarothrae</i>, <i>Chrysothamnus viscidiflorus</i>, <i>Astragalus douglasii</i>, <i>Astragalus lentiginosus</i>, <i>Equisetum laevigatum</i>, <i>Lotus crassifolius</i>, <i>Agropyron sp.</i> Collections from 'Big Meadows,' 'Canyon above Big Meadows,' and '0.25 mi. S of Heart Bar Campground.' SBNF. RSA relocated occurrence W of and within Big Meadows 2003. 16 acres occupied habitat. Disturbances= unauthorized road to dispersed camping site, equestrian use along river trail, fencing. <i>Bromus tectorum</i>. Overall occurrence/site ranking=good to marginal. (RSA) SBNF</p>	SBD

5	U 7100	U 2003	<p>Above South Fork Public Camp, Santa Ana River, San Bernardino Mountains. Mapped at South Fork Campground. Yellow pine forest, on sand banks of river. Dry gravelly creek bottom, with <i>Gilia sinuata</i>, <i>Eriastrum</i> sp., <i>Chaenactis</i> sp. Includes three other collections from 1922-1952. SBNF. RSA 2003 relocated occurrence. 8 acres of occupancy. Overall occurrence/site ranking=good to marginal. Disturbances=plants growing on disturbed berms. Recreational cabin use, incense cedar branches trimmed along road, broken glass, fire pit, off road vehicle tracks, <i>Bromus tectorum</i>. (RSA) SBNF</p>	SBD
6	U 0	1941 2003	<p>Mill Creek Canyon, San Bernardino Mountains. Just below foot of Dobbs Trail. Needs fieldwork. SBNF. RSA could not relocate on July11, 2003 during focused surveys. Current land use is developed picnic area and trails. RSA states it is possible plants occur here. Habitat may be suitable along lower portions of Vivian Cr. Trail. Area needs additional surveys earlier in the year.</p>	SBD
7	U 0	1926 2003	<p>Head of Clarks Grade, San Bernardino Mountains. On dry slopes at head of grade. Needs fieldwork. SBNF. RSA could not relocate on July11, 2003 during focused surveys. This site is not typical habitat and no disturbance was observed. Dense cover of <i>Arctostaphylos patula</i> and <i>Ceanothus cordulatus</i>. Area also surveyed from base of rd leading to Clark's summit.</p>	SBD

8	U 0	1900 2003	Seven Oaks, San Bernardino Mountains. Type locality. Location vague. Needs fieldwork. SBNF RSA could not relocate on July 11, 2003 during focused surveys. Site is highly developed and disturbed. Populations possibly crowded out by <i>Bromus tectorum</i> . Potential for habitat to recover rated poor. Disturbance= S side of SA River @ 7 oaks, cabin use, and development, recreational use (fishing, camping). <i>Bromus tectorum</i> abundant, dominant annual ground cover, also <i>Sisymbrium altissimum</i> , <i>Erodium cicutarium</i> . Pvt and SBNF lands	SBD
9 MisID	U 0	1927 2003	Near Whiskey Spring, Cushenbury Road, desert side of San Bernardino Mountains. Mapped along road near Whiskey Spring. Needs fieldwork. SBNF. RSA could not relocate on August 3, 2003 during focused surveys. CNDDDB is misID in 1927, annotated in 1958 by Alva Grant as <i>G. leptantha</i> ssp. <i>transversa</i> as per RSA 2003.	SBD
*(RSA)	U	1963	Along Hwy 38. Elev. 8000'. Yellow pine-white fir forest. SBNF.	SBD
*(RSA)	U	1992	Heart Bar State Park, ca. 0.25 mi. S of Heart Bar Campground in forest area between the campground and the river. w/ <i>Penstemon labrosus</i> , <i>Gutierrezia sarothrae</i> , <i>Astragalus douglasii</i> , <i>Astragalus lentiginosus</i> , <i>Equisetum laevigatum</i> , <i>Lotus crassifolius</i> , <i>Agropyron</i> .	SBD
*(RSA)	U	1976	Hwy. 38, 0.5 mi. E of Heart Bar State Park. 7000'. U.	SBD

RSA	490,000	2003	Coon Creek to Heart Bar Cr. 246 acres of occupancy. Disturbance=cut trees, litter/trash, private property at upper end, new cabin vandalized. Along road, <i>Bromus tectorum</i> , <i>Agropyron cristatum</i> @ Tayles Hidden Acres, camp sites and equestrian use. Occurrence productivity, habitat condition, long term prospects for viability, defensibility rating=excellent to good. SBNF	SBD
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- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Specific threats to *Gilia leptantha* ssp. *leptanthea* documented during the 2003 surveys are listed in the table above.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Gilia leptantha* ssp. *leptantha*:

- Conduct surveys to relocate historical occurrence numbers 6 and 8. Assess population status and current threats.
- Survey all new occurrences of *Gilia leptantha* ssp. *leptantha* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Gilia leptantha* ssp. *leptantha* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Gilia leptantha* ssp. *leptantha* in the planning area using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Gilia leptantha ssp. *leptantha* is endemic to the upper Santa Ana River watershed in the San Bernardino Mountains, San Bernardino County, California (Krantz, et. al. draft 2000, California Native Plant Society 2001). The California Natural Diversity Database (2004) contains nine records for this taxon. In

2003, RSA relocated 3 of the occurrences and documented one new location. In the 2003 surveys, approximately 886,900 individual *Gilia leptantha* ssp. *leptantha* plants were observed on 386 acres. No substantial threats to habitat were noted, however habitat is affected by trails, dispersed camping, vegetation management (hazard tree removal), and other recreational uses. Plants appear to tolerate some level of disturbance.

Based on this analysis, this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Gilia leptantha* ssp. *leptantha* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Gilia leptantha* ssp. *leptantha* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Munz, Philip A. 1974. *A flora of southern California*. University of California Press, Berkeley and Los Angeles, CA.

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USDA Forest Service. 2003. "CNDDDB forms completed by RSABG for *Gilia leptantha* ssp. *leptantha*." Records on file on the San Bernardino National Forest, Big Bear Ranger Station, Fawnskin, CA.

Geraea viscida

Githopsis diffusa ssp. filicaulis

Githopsis diffusa ssp. filicaulis

Githopsis diffusa Gray ssp. *filicaulis* (Ewan) Morin (Mission Canyon blue-cup)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T1Q, S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 3; R-E-D Code ?-3-3

General Distribution

Githopsis diffusa ssp. *filicaulis*, Mission Canyon blue-cup, is endemic to the Peninsular Ranges of San Diego and Riverside counties (Morin 1993).

Distribution in the Planning Area

Githopsis diffusa ssp. *filicaulis* is not known to occur on National Forest System lands. It has been found in the vicinity of El Cajon Mountain adjacent to the Cleveland National Forest and south of Hemet adjacent to the San Bernardino National Forest (California Natural Diversity Database 2004).

Taxonomy and Natural History

Githopsis diffusa ssp. *filicaulis* is an herbaceous annual with decumbent stems of 8-25 cm. Leaves (3-10 mm) and bracts (1-5 mm) are both oblong-lanceolate. Corolla is white to pale blue, 1.5-5 mm, funnel-shaped, with lobes of .7-2.5 mm. The ovary is 3-4 times longer than wide at the top. Plants flower from April to June (Hickman 1993, Morin 1983).

Four subspecies of *Githopsis diffusa* are recognized (Morin 1983). Both flower and fruit are needed to identify this taxon from other *G. diffusa* subspecies. Of the three subspecies occurring in the Peninsular Ranges, *Githopsis diffusa* ssp. *filicaulis* is distinguished by its slender stems and smaller flowers. Because it is so uncommon and not well studied, its taxonomic distinctness has been questioned (California Native Plant Society 2001).

Habitat Description

Githopsis diffusa ssp. *filicaulis* grows in open, grassy areas in chaparral at elevations of 1,475-2,300 feet (450-700 meters) in moist sandy loam soils (California Native Plant Society 2001, California Natural Diversity Database 2004).

Occurrence Status

The California Natural Diversity Database reports three occurrences of *Githopsis diffusa* ssp. *filicaulis*. The Bureau of Land Management owns a portion of one of these occurrences at El Cajon Mountain and another is preserved in the Silverwood Wildlife Sanctuary owned by the Audubon Society. The third occurrence is 16 km south of the town of Hemet on private lands. On National Forest System lands there are no known occurrences. However, potential habitat exists on El Cajon Mountain and other gabbro soil areas in the Descanso and Palomar Ranger Districts.

Threats

Threats are not known.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Githopsis diffusa* ssp. *filicaulis*:

- Survey areas of potential habitat (gabbro soils and El Cajon Mountain area) in the Cleveland National Forest and in suitable habitat within the San Bernardino National Forest. Incorporate any occurrences found into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Githopsis diffusa ssp. *filicaulis* has not been found on National Forest System lands, but potential habitat exists on the Cleveland and San Bernardino National Forests in areas adjacent to known occurrences. Until populations are found on National Forest System lands, there are no known threats to this taxon from Forest Service activities.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the plan area.

Viability Outcomes

Githopsis diffusa ssp. *filicaulis* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

There are no documented occurrences on National Forest System lands for *Githopsis diffusa* ssp. *filicaulis*, but the taxon should be considered when conducting plant surveys in potential habitat. It is therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Githopsis diffusa* ssp. *filicaulis*.

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Gilia leptantha* ssp. *leptantha

Grindelia hirsutula* var. *hallii

Grindelia hirsutula var. hallii

Grindelia hirsutula Hook. & Arn. var. *hallii* (Steayerm.) M. A. Lane (San Diego gumplant)

Management Status

Federal: None

California: None

Heritage Rank: G4T2, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Grindelia hirsutula var. *hallii*, San Diego gumplant, is endemic to the Peninsular Ranges and adjacent Sonoran Desert of San Diego County (Lane 1993). It is currently known from several large populations and many small populations on federal lands, in Cuyamaca Rancho State Park, and on private lands (California Natural Diversity Database 2004).

Distribution in the Planning Area

On the National Forest System lands, *Grindelia hirsutula* var. *hallii* occurs in about 7 large occurrences and several other smaller occurrences on the Cleveland National Forest in the Laguna Mountains (California Natural Diversity Database 2004).

Taxonomy and Natural History

Grindelia hirsutula var. *hallii* is an herbaceous perennial in the sunflower family (Asteraceae), 2-6 dm, appearing white to coppery. Leaves are light yellow-green, 1-10 cm long, oblong to lanceolate. Inflorescence heads usually not subtended by bracts. The involucre is 8-18 mm in diameter, phyllaries are erect to more or less recurved. Rays flowers are usually 12-20 with ligules 8-9 mm. Disk flowers are many (Lane 1993). Plants flower from July to October (California Native Plant Society 2001).

Grindelia hirsutula var. *hallii* is one of four varieties of *G. hirsutula* that occur in California (Lane

1993). *Grindelia hirsutula* var. *hallii* has a more southern distribution and is limited to San Diego County, while varieties *davyi*, *hirsutula*, and *maritima* have a more northern distribution in California.

Habitat Description

Grindelia hirsutula var. *hallii* grows on sandy or clay soils in mesic places within meadows, dry slopes, chaparral, grassland, and open pine-oak woodland (Lane 1993, California Native Plant Society 2001). It is found with *Quercus agrifolia* (coast live oak) on Guatay Mountain and with *Pinus jeffreyi* (Jeffrey pine) and *Quercus kelloggii* (black oak) in the Laguna Mountains (Stephenson and Calcarone 1999).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 35 known occurrences of *Grindelia hirsutula* var. *hallii* (California Natural Diversity Database 2004). Eleven of the occurrences are on private lands with population numbers ranging from 5 to over 10,000 individuals along Sentenca Creek south of Spencer Valley (California Natural Diversity Database 2004). The remaining occurrences are in Rancho Cuyamaca State Park (14 occurrences) and on the Cleveland National Forest (10 occurrences).

OCCURRENCE DATA of *Grindelia hirsutula* var. *hallii* (San Diego gumplant) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
U	2-1	U	1977	Laguna Mountains / CNF	SD
U	2-2	U	1977	Crouch Valley / CNF	SD
30	2-3	350+	1994	Filaree Flat Meadow / CNF	SD
32	2-4	300	1989	Filaree Flat Meadow / CNF	SD
32	2-5	28	1989/1994	Filaree Flat Meadow / CNF	SD

28	2-6	1	1989	Near Camp Ole Fire Station / CNF	SD
26	2-8	300	1989	Laguna Meadows / CNF	SD
24	2-9	1	1989	Laguna Mountains / CNF	SD
32?	2-10	150	1989	Laguna Mountains / CNF	SD
	2-11	250			
33	2-19	30	1992	Laguna Mountains / CNF	SD
29	2-12	1	1990	Descanso / CNF	SD
31	2-13	2	1990	Near Laguna Meadows / CNF	SD
26	2-14	5	1990	Laguna Mountains / CNF	SD
26	2-15	1	1990	S. of Laguna Meadows / CNF	SD
18	*	5+	1994	Crouch Valley / private not CNF	SD
30?	2-18	10+	1992	Filaree Flat Meadow / CNF	SD
25	2-20	200	1992	N. of Kitchen Creek Road / CNF	SD

27	2-16	5	1994	Guatay Mt	SD
		100	1995		

- U = Unknown
- * = an occurrence number has not been assigned
- CNF = Cleveland National Forest
- SD = San Diego County

Threats

On private lands development and road maintenance may affect *Grindelia hirsutula* var. *hallii* plants. Grazing, recreation, invasion of nonnative plants, and roads-related activities (maintenance, debris, off highway vehicle use, parking) could possibly affect *Grindelia hirsutula* var. *hallii* on the Cleveland National Forest. Change to the surface hydrology of meadow habitat caused by road projects is a potential threat (Stephenson and Calcarone 1999). *Grindelia hirsutula* var. *hallii* appears to be tolerant of some ground disturbance (e.g., fire and low levels of grazing and grading) (USDA Forest Service 1998). Expansion of recreational uses and development around Cuyamaca Lake (private property) may affect this species (Reiser 1994).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Grindelia hirsutula* var. *hallii*:

- Continue to monitor species occurrences for indications of population decline on the Cleveland National Forest. (No longer on Regional Forester's sensitive species list).

Evaluation of Current Situation and Threats for National Forest System Lands

Grindelia hirsutula var. *hallii* is found in numerous locations in several habitats on the Cleveland National Forest. Although some Forest Service activities have the potential to affect some populations, these activities do not appear to present a substantial threat to persistence of this taxon on National Forest System lands. *Grindelia hirsutula* var. *hallii* appears to be somewhat disturbance-adapted, and populations on the Cleveland National Forest are considered to be stable at this time.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, but numerous where it occurs, in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

This species is considered to have low vulnerability on National Forest System lands (Stephenson and Calcarone 1999). No specific conservation measures appear to be necessary to maintain the viability of San Diego gumplant on National Forest System lands. Populations on National Forest System lands appear to be stable (USDA Forest Service 1998). As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Grindelia hirsutula* var. *hallii*.

Variations in land use designations would not alter this current situation and the various emphases of the alternatives would not result in a substantial change in conditions for *Grindelia hirsutula* var. *hallii*. *Grindelia hirsutula* var. *hallii* would remain generally well distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

Grindelia hirsutula var. *hallii* populations are relatively stable (Reiser 1994). However, this species occurs in limited distribution and is considered to be in danger of local extirpation in a portion of its range (California Native Plant Society 2001). By maintaining the current distribution of *Grindelia hirsutula* var. *hallii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Grindelia hirsutula* var. *hallii* to suffer a decline in its overall distribution.

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Githopsis diffusa ssp. filicaulis

**Helianthus nuttallii ssp.
parishii**

Helianthus nuttallii ssp. parishii

Helianthus nuttallii Torrey & Gray ssp. *parishii* (A. Gray) Heiser (Los Angeles sunflower)

Management Status

Federal: Forest Service Watch List

California: None (currently under review for addition to the California state list of Endangered species)

Heritage Rank: G5TH; SH (California Natural Diversity Database)

California Native Plant Society (2001): List 1A; R-E-D Code -- *(may be changed to CNPS 1B (Painter 2004).

General Distribution

Helianthus nuttallii ssp. *parishii* historically occurred in Los Angeles, Orange, and San Bernardino counties. Long believed to have gone extinct, this plant was recently rediscovered by botanists along the upper Santa Clara River in 2002 (Fausset and Chambers 2002). However positive identification has not been made because a voucher specimen has not been deposited at a herbarium. Boyd and Wilken feel that further work is needed for proper identification (Painter 2004).

Distribution in the Planning Area

There are no known extant occurrences of *Helianthus nuttallii* ssp. *parishii* on National Forest System lands; however, there are two historical occurrences on the San Bernardino National Forest. There may be additional suitable habitat on the San Bernardino and Angeles national forests.

Taxonomy and Natural History

Helianthus nuttallii is dicotyledon in the sunflower family (Asteraceae) that blooms August-October (California Native Plant Society 2001). *Helianthus nuttallii* is a 5-40 dm perennial that grows from clustered, tuber-like roots. The rhizome is short. The leaves may be alternate or opposite and are subsessile with 10-20 cm blades that are narrowly lanceolate to ovate, acute to acuminate, and entire to serrate. There are few-many inflorescence heads. The peduncles are 1-18 cm, the involucre is 1-2 cm in diameter, the phyllaries are more or less erect, 8-16 mm, generally less than 3 mm wide, more or less

linear, and equal or slightly larger than the disk. The chaff scales are 8-12 mm, entire or three-toothed, acute, and short-rough-hairy. There are 12-20 ray flowers. The ligules are 15-25 mm. The disk flower corollas are 5-6 mm with yellow lobes. The fruits are 3-4 mm and the pappus scales are 3-4 mm, sometimes also with shorter scales. *Helianthus nuttallii* ssp. *parishii* has glabrous to tomentose stems. The leaf blades are rough-hairy to densely tomentose above and more or less finely tomentose below. The inflorescence is characterized by tomentose peduncles and phyllaries (Keil 1993). The recently discovered *Helianthus nuttallii* ssp. *parishii* population contained plants that were 10-12 feet tall (Fausset and Chambers 2002).

Habitat Description

Helianthus nuttallii ssp. *parishii* inhabits coastal salt and freshwater marshes and swamps between 10-500 m (California Native Plant Society 2001). The only known extant occurrence occupies a boggy streambank (Fausset and Chambers 2002).

Occurrence Status

There are eight historical records of *Helianthus nuttallii* ssp. *parishii* (California Natural Diversity Database 2004) and one additional recently discovered occurrence. This taxon, long believed to have been extinct, was rediscovered on private land owned by Newhall Land & Farming Company in 2002. According to a Newhall Land spokeswoman, this occurrence is in an area that will not be directly impacted by development (Fausset and Chambers 2002).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Helianthus nuttallii* ssp. *Parishii* (Los Angeles sunflower)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
2	U	1903	Oak Knoll, Pasadena. One clump remaining in 1903, but presumed extirpated now. Land owner: U. [maps very near the ANF Oak Grove Workcenter]	LA

4	U	191U	Near Seven Oaks, San Bernardino Mountains near Converse Ranger Station. Mapped near Seven Oaks Resort. Surveyors should check along the Converse Ck and near Seven Oaks. SBNF.	SBD
5	U	1917	Santa Ana River, S of San Bernardino. Mapped by CNDDDB S of San Bernardino at Santa Ana River. Site represented by six collections. Exact location U. Land owner: U. Extirpated.	SBD
8	U	1923	Mountain Home Village, San Bernardino Mountains. Exact location: U. Best guess mapped by CNDDDB along Mill Creek Road in vicinity of Mountain Home Village. Needs fieldwork. SBNF.	SBD
9	U	1923	Lone Pine Canyon, San Gabriel Mountains. Boggy meadow. Exact location U, mapped by CNDDDB in vicinity of Clide Ranch. Needs fieldwork. Land owner: SBNF?	SBD
*	< 12	2002	Santa Clara River. Boggy bank along the river. Newhall Ranch. South of SH 126, West of Golden State (5) Freeway. Newhall Land and Farming Company.	LA

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

Threats

Alterations to watersheds from flood control projects, draining of swamps, clearing by burning, and development decimated nearly all occurrences of *Helianthus nuttallii* ssp. *parishii* (van de Hoek and California Native Plant Society 2002). The development of Mountain Home Village may have extirpated occurrence 8.

Current threats to the only known extant occurrence include indirect impacts from development of the Newhall Ranch, such as hydrological alteration and introduction of non-native species. If historic and/or undiscovered occurrences are extant on National Forest System land, the primary threat would be water developments.

Conservation and Management Considerations

The primary conservation strategy for this species is to improve the knowledge of its distribution and determine whether any occurrences are extant on NFS land. The following is a list of conservation practices that should be considered for *Helianthus nuttallii* ssp. *parishii*:

- Conduct surveys for CNDDDB occurrences 4, 8 and 9 to determine status of occurrences and habitat conditions.
- Survey any new occurrences of *Helianthus nuttallii* ssp. *parishii* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Helianthus nuttallii* ssp. *parishii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Helianthus nuttallii* ssp. *parishii* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Helianthus nuttallii ssp. *parishii* is a nearly-extinct species that is currently known only to occur in boggy streamside habitat in the Newhall Ranch Area. Three historic records are near the San Bernardino National Forest, and suitable habitat near these localities exists on the San Bernardino National Forest and Angeles National Forest.

Based on this analysis, *Helianthus nuttallii* ssp. *parishii* has been assigned the following threat category:

2. Potential habitat only in the plan area.

Viability Outcomes

Helianthus nuttallii ssp. *parishii* is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Helianthus nuttallii* ssp. *parishii* to the extent

possible. This information will be used to track or "watch" for trends in species abundance and distribution.

No populations of *Helianthus nuttallii* ssp. *parishii* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Helianthus nuttallii* ssp. *parishii*.

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Heuchera abramsii

Heuchera abramsii Rydb. (Abram's alumroot)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Heuchera abramsii is known from occurrences in San Bernardino, Los Angeles, and Ventura counties. This species is endemic to the Mount San Antonio area of the eastern San Gabriel Mountains, except for a single record from Rose Lake north of Ojai Valley in Ventura County.

Distribution in the Planning Area

All documented occurrences of *Heuchera abramsii* are on National Forest System lands. Four occurrences are known from Mt. San Antonio in the Sheep Mountain Wilderness of the Angeles National Forest (ANF), and one record is from Rose Lake near Lion Canyon on the Los Padres National Forest (LPNF).

Taxonomy and Natural History

Heuchera abramsii is a rhizomatous perennial herb in the saxifrage family (Saxifragaceae). Leaf blades are generally less than 15 mm long and more or less deeply 5-lobed. The inflorescence is dense and 5-15 cm long with sessile glands. Part of the hypanthium is fused to the ovary beneath the long side of the free part. Calyx lobes are unequal and generally red-purple. Stamens are equal, included, and shorter than the calyx lobes (Elvander 1993). Flowering typically occurs between July and August (Munz 1974).

Habitat Description

Heuchera abramsii occurs in dry, rocky areas of upper montane coniferous forest at elevations of 2,800-3,500 meters (Elvander 1993). Sparse overstory vegetation consists of Jeffrey pine (*Pinus jeffreyi*), white fir (*Abies concolor*), lodgepole pine (*Pinus contorta* var. *murrayana*), and limber pine (*Pinus flexilis*) (Holland 1986; Krantz, et. al. draft 2000).

Potential habitat occurs throughout the Sheep Mountain Wilderness on the ANF, and it is possible that more occurrences may exist in the area. Potential habitat also exists in the Cucamonga Wilderness on the Angeles and San Bernardino national forests. The San Gorgonio Wilderness of the San Bernardino National Forest (SBNF) also contains suitable habitat for *Heuchera abramsii*.

Occurrence Status

Population trends are not known for *Heuchera abramsii*.

The table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Heuchera abramsii* (Abram's alumroot)

Occurrence ID No. (CalFlora 2002)	No. of Plants	Year Reported	Location/Land Owner	County
1381839	U	1901	Mt. San Antonio. ANF – Sheep Mountain Wilderness.	SBD
888505	U	1901	California: San Bernardino: Mt. San Antonio. ANF – Sheep Mountain Wilderness.	SBD
1213945	U	1922	Mt. San Antonio Baldy, San Gabriel Mts. ANF – Sheep Mountain Wilderness.	LA
1323327	U	1971	Old Baldy saddle ridge between West Baldy and; San Gabriel Mts. ANF – Sheep Mountain Wilderness.	LA

1821668	U	1962	Rose Lake [near waterfalls]. LPNF	VEN
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- *U = Unknown*
- *ANF = Angeles National Forest*
- *LPNF = Los Padres National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*
- *VEN = Ventura County*

Threats

Heuchera abramsii may be at risk from trampling by off-trail hikers, but these impacts are probably minor and limited to the habitat immediately adjacent to trails (California Natural Diversity Database 2004; USDA Forest Service 2002). Another potential threat to this species is collection by nursery trade, as *Heuchera* in general becomes increasingly popular with alpine and rock-garden plant collectors. Any threats associated with ski area expansion would be addressed at the project level.

Conservation and Management Considerations

The primary strategy for the conservation of this species is to improve the knowledge of its distribution and to monitor and remedy impacts of trail use. The following is a list of conservation practices that should be considered for *Heuchera abramsii*:

- Monitor trails where they transect occupied habitat and identify areas where off-trail foot traffic is impacting this species. Install protective measures where needed.
- Survey all new occurrences of *Heuchera abramsii* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Heuchera abramsii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Heuchera abramsii* in the planning area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Heuchera abramsii is narrowly distributed and locally common. While some of the recorded occurrences are vulnerable to identified threats, others are remote and not vulnerable to impacts. Occurrences within established wilderness on the ANF provide a level of protection.

Based on this analysis, *Heuchera abramsii* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Heuchera abramsii is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Heuchera abramsii* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Heuchera abramsii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Heuchera abramsii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

CalFlora: Information on California plants for education, research and conservation. [web application]. 2002. Berkeley, California: The CalFlora Database [a non-profit organization].

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**Helianthus nuttallii ssp.
parishii**

Heuchera brevistaminea

Heuchera brevistaminea

Heuchera brevistaminea Wiggins (Mount Laguna alumroot)

Management Status

Federal: None

State: None (California Natural Diversity Database)

Heritage Rank: G2, S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Heuchera brevistaminea, Mount Laguna alumroot, is found primarily on the desert escarpment of the Laguna Mountains and nearby areas in San Diego County (Keil 1993, Stephenson and Calcarone 1999). It has also been located below the summit of Cuyamaca Peak in the Cuyamaca Mountains. One occurrence reported from near Santa Rosa and Toro Peaks in western Riverside County might represent a northern disjunct or range extension (Reiser 1994; Winter 1998). However, no occurrences from Riverside County have been documented in the California Natural Diversity Database (CNDDDB) (California Natural Diversity Database 2004).

Distribution in the Planning Area

About 12 occurrences of *Heuchera brevistaminea* are known, some of them relatively large (Stephenson and Calcarone 1999, California Natural Diversity Database 2004). Most of these occurrences are located on the Cleveland National Forest. Occurrences are known from Garnet and Monument Peaks, Oasis Spring, and Mount Laguna.

Taxonomy and Natural History

Heuchera brevistaminea is a rhizomatous herbaceous perennial in the saxifrage family (Saxifragaceae) with ovate basal leaves and inflorescence of 18-25 cm. The hypanthium, partly fused to the ovary, is greater than the long side of free part. Calyx lobes are slightly unequal, generally red-purple. Stamens are much shorter than the calyx. Plants look much like *H. cespitosa* (Keil 1993). Plants bloom from April to September (California Native Plant Society 2001).

Habitat Description

Heuchera brevistaminea grows in dry areas on rocky soils in desert montane communities; including chaparral, pinyon woodland, and California bay forest (California Natural Diversity Database 2004). It grows on steep rock faces and crevices or on exposed rock slabs (Reiser 1994).

Occurrence Status

The California Natural Diversity Database lists 9 records for *Heuchera brevistaminea* (California Natural Diversity Database 2004). All locations are on state or federal lands. Two of these locations are on the Anza Borrego State Parks. The remaining occurrences are located on the Cleveland National Forest. Another location is reported for the Cuyapaipe Indian Reservation.

OCCURRENCE DATA of *Heuchera brevistaminea* (Mount Laguna alumroot) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
9	*	U	1997	Monument Peak / CNF	SD
3 ?	2-1	U	1997	Monument Peak / CNF	SD
2	2-2	U	1979	Garnet Peak / CNF	SD
*	2-3	U	U	Near El Bahr Shrine Camp / CNF	SD
1 ?	2-4	U	1979	Oasis Spring / CNF	SD
4	2-5	10	1992	Upper Cottonwood Canyon / CNF	SD
*	2-7	U	U	Cuyapaipe Indian Reservation not CNF	SD
*	2-8	100	1982	Mt. Laguna / CNF	SD

7	2-9	15	1987	Pacific Coast Trail / CNF	SD
8	2-10	10	1992	Upper Potrero Canyon / CNF	SD

- *U = Unknown.*
- *an occurrence number has not been assigned.*
- *CNF = Cleveland National Forest*
- *SD = San Diego County*

Threats

Because *Heuchera brevistaminea* occurs on steep, inaccessible cliffs, it appears that there are no real threats to this species within National Forest System lands, and they are relatively impervious to management (USDA Forest Service 1998). Other occurrences are protected on state lands (USDA Forest Service 1998; Stephenson and Calcarone 1999). However, occurrences on the eastern Laguna Mountain slopes may have burned over in the Garnet and Pine Fires in 2002. Loosening of rock and erosion due to fires may negatively affect some occurrences (Sproul 1979).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Heuchera brevistaminea*:

- Relocate occurrences on Laguna Mountain and monitor for potential erosion threats following the Garnet and Pines Fires of 2002.

Evaluation of Current Situation and Threats on National Forest System Lands

Populations of *Heuchera brevistaminea* on National Forest System lands are located on rocky escarpments, inaccessible to recreation users or other National Forest management activities. These populations appear to be stable and to have low vulnerability to local extirpation.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon and restricted distribution in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Heuchera brevistaminea* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Heuchera brevistaminea* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Heuchera elegans

Heuchera elegans Abrams (Urn-flowered alumroot)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Heuchera elegans is nearly endemic to the San Gabriel Mountains in California. It is most common in the central San Gabriel Mountains (USDA Forest Service 2002). There are two unconfirmed historic records from the San Bernardino Mountains and one disjunct record from the Sespe area of Ventura County.

Distribution in the Planning Area

Heuchera elegans occurs on the Angeles, San Bernardino, and Los Padres national forests (CalFlora 2002). In the Angeles National Forest, *Heuchera elegans* is known from Martins Camp near Mt. Wilson, Mt. Lowe, Occidental Peak, Little Tujunga and Pacoima Canyons, and Mount Disappointment. There is an occurrence at Ontario Peak in the Cucamonga Wilderness that straddles the border between the Angeles and San Bernardino national forests. On the San Bernardino National Forest, there are occurrences from the Coldwater Fork of Lytle Creek and Icehouse Canyon. Two old records warrant confirmation, one at Fredalba Park and one at South Fork Santa Ana River. There is one occurrence from Rose Valley Falls along Sespe Creek watershed in the Los Padres National Forest. There is also a disjunct occurrence of *Heuchera abramsii* at/near this locality.

Taxonomy and Natural History

Heuchera elegans (formerly described as *Heuchera rubescens* var. *elegans*) is a dicotyledon in the saxifrage family (Saxifragaceae). This perennial herb flowers from May-June. This species differs from the closely related *Heuchera abramsii* by its villous hirsute flowers and more or less hirsute petioles

(Allan and others 1995).

Heuchera elegans has an inflorescence characterized by few, small, leaf-like bracts. Part of the hypanthium is fused to the ovary and is shorter than the long side of the free part. The calyx lobes are unequal. The stamens are less than the calyx lobes and are equal and more or less included (Elvander 1993).

Habitat Description

Heuchera elegans inhabits rocky areas in lower and upper montane coniferous forest between 4000-8500 feet (Elvander 1993). Montane coniferous forest is well distributed within the Province; however, suitable rocky areas within this habitat are more narrowly distributed.

Occurrence Status

CalFlora (2002) reports 11 specific locations where *Heuchera elegans* has been documented, all of which are on National Forest System lands.

The table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Heuchera elegans* (Urn-flowered alumroot)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
1206202	U	1918	Ontario Peak, near Ontario Ridge. At boundary between ANF/SBNF: Cucamonga Wilderness.	SBD
1821671	U	1917	Coldwater Fork of Lytle Creek. SBNF.	SBD
1321662	U	1966	Icehouse Canyon slope above stream in middle reaches. San Gabriel Mtns. SBNF.	SBD
*	U	1917	Fredalba Park (Parish)	SBD

*	U	?	South Fork Santa Ana, 7500' (Roos, as <i>H rubescens</i>)	SBD
1323122	U	1902	Martins Camp, Mt. Wilson. ANF.	LA
1368698, 1821670, 1395387	U	1929, 1906, 1906	Mt. Lowe. ANF.	LA
1249358	U	1989	Mt. Baldy Rd. 1.6 mi. W of Glendora Ridge Rd., N-facing road bank [maps near Icehouse Cn confluence with San Antonio River]. ANF.	LA
1333475	U	1971	Occidental Peak, N slope. Along Mt. Wilson Rd. ANF.	LA
1248828	U	1953	Little Tujunga and Pacoima Canyons along Forest Service road following crest of Mendenhall Ridge, 9 mi. E of its start at paved road crossing western crest of this ridge btw. W end. ANF.	LA
1206201	U	1918	N of Pasadena. N slope of Mt. Lowe near the summit. ANF.	LA
1191694	U	1947	Mt. Disappointment, N-slope. ANF.	LA
1198164	U	1958	Rose Valley Falls, Sespe Creek watershed. Los Padres National Forest.	VEN

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

- *VEN = Ventura County*

Threats

Heuchera elegans may be at risk from trampling by off-trail hikers, but these impacts are probably minor and limited to the habitat immediately adjacent to trails (California Natural Diversity Database 2002; USDA Forest Service 2002). Another potential threat to this species is collection by nursery trade, as *Heuchera* in general becomes increasingly popular with alpine and rock-garden plant collectors. Any threats associated with ski area expansion would be addressed at the project level.

Conservation and Management Considerations

The primary strategy for the conservation of this species is to improve the knowledge of its distribution and to monitor and remedy impacts of trail use. The following is a list of conservation practices that should be considered for *Heuchera elegans*:

- Monitor trails where they coincide with occupied habitat and identify areas where off-trail foot traffic is impacting this species. Install protective measures where needed.
- Survey all new occurrences of *Heuchera elegans* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats. In particular, survey the Rose Valley Falls area of the LPNF for this species and *Heuchera abramsii*.
- Collect a herbarium voucher specimen of *Heuchera elegans* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Heuchera elegans* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Heuchera elegans is narrowly distributed and widely scattered. While some of the recorded occurrences are vulnerable to identified threats, others are remote and not vulnerable to impacts. Effects to occurrences within established wilderness areas are expected to be minimal.

Based on this analysis, *Heuchera elegans* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Heuchera elegans is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Heuchera elegans* to the extent possible. This

information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Heuchera elegans* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Heuchera elegans* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Heuchera hirsutissima

Heuchera hirsutissima C. Rosend., F.K. Butters, & Lakela (Shaggy-haired alumroot)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Heuchera hirsutissima is endemic to the northern Peninsular Ranges in Riverside County (California Native Plant Society 2001). Populations have been reported from Toro Peak in the Santa Rosa Mountains and from San Jacinto Peak, Tahquitz Peak, and along a branch of Snow Creek in the San Jacinto Mountains (California Natural Diversity Database 2004).

Distribution in the Planning Area

Heuchera hirsutissima occurs in the Mt. San Jacinto Wilderness Area on the San Bernardino National Forest and in Mount San Jacinto State Park (California Natural Diversity Database 2004).

Taxonomy and Natural History

Heuchera hirsutissima is a dicotyledonous plant in the saxifrage family (Saxifragaceae).

Heuchera hirsutissima is a perennial rhizomatous herb that blooms May-July (California Native Plant Society 2001). Part of the hypanthium is fused to the ovary, but much less than the long side of the free part. The calyx lobes on the long side of the hypanthium are minute. Stamens are more or less equal to the calyx lobes and are included (Elvander 1993).

Heuchera hirsutissima is part of a species complex in the southern California mountain ranges that is in need of taxonomic study.

Habitat Description

Heuchera hirsutissima grows among rocks and in crevices of granite boulders at elevations of 3,500–10,800 feet (1,815-3,500 meters) in upper montane conifer and subalpine forest habitats in the San Jacinto and Santa Rosa Mountains (California Native Plant Society 2001).

Occurrence Status

The California Natural Diversity Database (2004) lists seven occurrences, most of which are known only from historic collections. Additional records are from the UCR Herbarium and State Park records.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Heuchera hirsutissima* (shaggy-haired alumroot)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	'abundant'	1922	Toro Peak, Santa Rosa Mountains. 7500-8300'. 1922 collection by Munz. Landownership: Santa Rosa Indian Reservation.	RIV
2	U	1939	Pinyon Alta Flats. Probably collected from upper end of Pinyon Flat near town of Pinyon Pines. (Elev. is 4,000+' but herbarium label says 6,000'). Land ownership: U	RIV
3	U	1933	Tahquitz Peak, San Jacinto Mountains. 1933 collection by Dunkle. Landownership: SBNF, San Jacinto Wilderness	RIV

4	U	1981	Gully behind Tahquitz Rock, San Jacinto Mountains. Site mapped west of Lily Rock along the east side of strawberry valley near the NE end of the town of Fern Valley. Subalpine forest with <i>Draba corrugata</i> , <i>Sedum watsonii</i> , and <i>Pinus flexilis</i> . Land ownership: U	RIV
5	U	1921	Tahquitz Creek, San Jacinto Mountains. Mapped along Tahquitz Creek in vicinity of Laws Camp. Land owner: U.	RIV
6	U	1932, 1933	Summit of San Jacinto Peak, San Jacinto Mountains. Mt. San Jacinto State Park.	RIV
7	U	1960	Cedar Falls, Main fork of Snow Creek, San Jacinto Mountains. Riparian vegetation at first incense cedars. Sandy soil on N slope. Collection by Olmstead. Land ownership: U	RIV
*	U	1946	Santa Rosa Mountains 7,500' (Roos/UCR)	RIV
*	U	1983	Snow Creek, 5,500 (Stolte/UCR)	RIV
*	U	1982	Forsee Ck, 8,800', above Barton Flats, trailside (Krantz/UCR) [<i>H. parishii</i> ??]	SBD
*	U	1981	Gully behind Taquitz Peak (Lyman/UCR). SBNF, San Jacinto Wilderness	RIV

*	U	1969	North slope above Black Mtn. Camp and east of Black Mtn , 7,700' (Ziegler/UCR) SBNF (Wilderness?)	RIV
*	U	1986	San Jacinto Mountains. Trail toward Spitler Peak from Hurkey Creek Camp to Bonita Vista Road, 6,000'. (Sanders/UCR)	RIV
*	U	1988	S of Hwy 74 dirt road to Toro and Santa Rosa Peaks. Toro Camp area, S facing slopes, E side, 7,500 (Charlton/UCR)	
*	U	U	Multiple occurrences from San Jacinto Peak, Miller Peak, Tamarak Valley, Cornell Peak, to about ½ mi east of Cornell Peak. San Jacinto SP Wilderness (SP occurrence records)	

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *RIV = Riverside County*

Threats

Rock climbing and trampling are potential threats to *Heuchera hirsutissima*. Many occurrences are remote and +/- inaccessible. No threats have been documented.

Conservation and Management Considerations

The primary strategy for the conservation of this species is to improve the knowledge of its distribution and to monitor and remedy any impacts to occupied habitat. The following is a list of conservation practices that should be considered for *Heuchera hirsutissima*:

- Monitor trails and other uses where they coincide with occupied habitat and identify any areas

where impacts are occurring. Install protective measures where needed.

- Survey all new occurrences of *Heuchera hirsutissima* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Heuchera hirsutissima* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Heuchera hirsutissima* in the plan area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Heuchera hirsutissima is narrowly distributed and has a patchy distribution within its narrow range. While some of the recorded occurrences may be vulnerable to potential threats, most are remote and not vulnerable to impacts. Potential effects to occurrences within the established San Jacinto Wilderness area would be expected to be minimal.

Based on this analysis, *Heuchera hirsutissima* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Heuchera hirsutissima is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Heuchera hirsutissima* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Heuchera hirsutissima* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

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Heuchera elegans

Heuchera parishii

Heuchera parishii

Heuchera parishii Rydb. (Parish's alumroot)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Heuchera parishii is endemic to the San Bernardino Mountains in San Bernardino County. There is one likely-erroneous record from San Jacinto Peak.

Distribution in the Planning Area

Heuchera parishii occurs on the San Bernardino National Forest, in the Big Bear area, the Upper Santa Ana River, Upper Mill Creek, and the San Gorgonio Wilderness to near the Summit (California Natural Diversity Database 2002). The occurrence on Mount San Gorgonio was visited in 2002, and plants were locally abundant on rocky slopes from near Dollar Lake area to near the summit. Other occurrences are known at Bear Mountain Ski Area, Snow Canyon, and Sugarloaf Ridge (USDA Forest Service 2002).

Taxonomy and Natural History

Heuchera parishii is a dicotyledon in the saxifrage family (Saxifragaceae). This species may have evolved as a hybrid of shaggy-haired alumroot (*H. hirsutissima*) and pink alumroot (*H. rubescens*). Small *Heuchera parishii* plants growing at high elevations have been proposed as *H. alpestris*, but this taxon has not received further recognition as a valid species (Elvander 1993).

Heuchera parishii is a rhizomatous perennial herb that flowers May-June (California Native Plant Society 2001). This species has leaves with 1-10 cm petioles. The leaf blades are 5-40 mm, broadly ovate to round-reniform, and shallowly 5-lobed. The inflorescence is 5-27 cm, narrow, more or less

dense, and glandular-hairy. The flowers are more or less bilateral, the hypanthium is inflated on the longer side, the part fused to the ovary is about 1.4 mm, more or less equal to the free part. The flowers with the calyx lobes are 3.5-6 mm. The calyx lobes are more or less equal and are pink with green tips. The petals are 2-3 mm, greater than the calyx lobes, unequal, and oblanceolate. The stamens are greater than the calyx lobes, more or less unequal, and exerted. The mature styles are greater than 1.5 mm and exerted (Elvander 1993).

Habitat Description

Heuchera parishii occupies rocky places in lower and upper montane and subalpine coniferous forests as well as alpine boulder and rock fields at elevations of 6,000-11,500 feet (1,500–3,800 meters) (California Native Plant Society 2001, California Natural Diversity Database 2004). Rocky slopes and outcroppings in the montane through alpine zones are narrowly distributed, but fairly well protected within the planning area. Many of these areas are situated in established Wilderness areas.

Occurrence Status

With the exception of occurrences in upper Mill Creek, which may be on private land, all known occurrences are on the SBNF in the San Bernardino Mountains. While population status has not been recorded, all occurrences are presumed extant because of this species low-vulnerability to disturbance.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Heuchera parishii* (Parish's alumroot)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1932	Summit of San Jacinto Peak, San Jacinto Mountains. Plants growing under rocks. Probably a mis-ID of <i>H. hirsutissima</i> . San Jacinto Mountain State Park.	RIV
2	U	1965	Mount San Gorgonio. Collected at 11,000. SBNF-San Gorgonio Wilderness. [occasional along trail to peak in 2002]	SBD

3	U	1923	Mill Creek, 1 mi. above Forest Home, San Bernardino Mtns. Mapped E of Forest Falls. Land owner: U.	SBD
4	U	1930	Bear Creek below Bear Valley Dam, San Bernardino Mtns. Shaded granite crevices under firs. SBNF.	SBD
5	U	U	Lower Holcomb Valley, San Bernardino Mtns. SBNF/Boy Scouts of America. Adjacent to pebble plain w/ <i>Arabis parishii</i> , <i>Arenaria ursina</i> , <i>Astragalus leucolobus</i> , <i>Castilleja cinerea</i> , <i>C. montigena</i> , <i>C. lasiorhyncha</i> , <i>Eriogonum kennedyi</i> , <i>Ivesia argyrocoma</i> , <i>Mimulus exiguus</i> , <i>M. purpureus</i> , <i>Taraxacum californicum</i> . SBNF/PVT.	SBD
*	U	U	Snow Canyon, off of Mill Creek Canyon (S side of Forest Falls). Land owner: U.	SBD
*	20	2000	Dry rocky slope above Fish Creek Meadow. Jeffrey/lodgepole pine forest w/ <i>Ceanothus</i> sp., <i>Pinus jeffreyi</i> , <i>Arctostaphylos</i> sp., <i>Penstemon</i> sp. SBNF-San Gorgonio Wilderness.	SBD
*	U	2002	Dollar Lake. Metamorphic/granite ridge above lake w/ <i>Ranunculus eschscholtzii</i> var. <i>oxynotus</i> , <i>Woodsia scopulina</i> , <i>Potentilla</i> , and <i>Juncus</i> . SBNF-San Gorgonio Wilderness.	SBD

*	U	2002 2004	Sugarloaf Ridge. Abundant on slope with mosses. SBNF. Sugarlump Peak E. to unknown peak elev. 9775 ft.USFS.	SBD
*	U	U	Bear Mountain Ski Area. SBNF.	SBD
*	U	2003	Butler Peak, in crevices of large rock outcrops along trail to fire lookout.	SBD
*	U	2004	Directly N. of Butler Peak Lookout, E of Glass Rd. the first ¼ mi. from intersection with Hwy. 38 W. of 1N69 and E. of Jenks Lake Rd. N. of San Gorgonio Wilderness Boundary. USFS.	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *PVT = Private Property*
- *RIV = Riverside County*

Threats

Where this species occurs in crevices in rock outcrops, it is fairly well protected from threats, except in areas where recreational bouldering is popular (e.g. Holcomb Valley). Occurrences on scree slopes adjacent to trails (e.g. Dollar Lake trail in the San Gorgonio Wilderness) are vulnerable to off-trail hiking. Threats from ski area development and operation at Bear Mountain are addressed at the project level (USDA Forest Service 2002).

Conservation and Management Considerations

The primary strategy for the conservation of this species is to improve the knowledge of its distribution and to monitor and remedy impacts of trail use and rockclimbing. The following is a list of conservation practices that should be considered for *Heuchera parishii*:

- Monitor trails where they coincide with occupied habitat and identify areas where off-trail foot traffic is impacting this species. Monitor areas where recreational bouldering or rock climbing coincides with occupied habitat. Install protective measures where needed.
- Survey all new occurrences of *Heuchera parishii* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Heuchera parishii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Heuchera parishii* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Heuchera parishii is narrowly distributed and widely scattered. While some of the recorded occurrences are vulnerable to identified threats, most are remote and not vulnerable to impacts. Threats within established wilderness areas are expected to be minimal.

Based on this analysis, *Heuchera parishii* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Heuchera parishii is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Heuchera parishii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Heuchera parishii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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USDA Forest Service. 2002. "Records on file" at the Big Bear Ranger Station, San Bernardino National Forest.

Heuchera hirsutissima

**Holocarpha virgata ssp.
elongata**

Holocarpha virgata ssp. elongata

Holocarpha virgata (Gray) Keck ssp. *elongata* Keck (Graceful tarplant)

Management Status

Federal: None

California: None

Heritage Rank: G5T3, S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-3

General Distribution

Holocarpha virgata ssp. *elongata*, graceful tarplant, is endemic to Riverside, Orange, and San Diego counties (California Native Plant Society 2001).

Distribution in the Planning Area

Holocarpha virgata ssp. *elongata* occurs on the Cleveland National Forest (Stephenson and Calcarone 1999). It is found on Margarita Peak in the San Mateo Canyon Wilderness (CalFlora 2000) and on Miller Mountain (Winter pers. comm.).

Taxonomy and Natural History

Holocarpha virgata ssp. *elongata* is a slender herbaceous annual of 2-12 dm, gracefully curved, with many branches not generally over-topping the main stem. Stems are soft hairy and glandular below, canescent or short bristly above, and resinous. Lower leaves are 6-15 cm, linear, bristly, resinous and upper leaves are crowded. Inflorescence peduncle is less than 15 cm, openly bracted. Flowers heads have 3-7 ray flowers of 4-6 mm long and 9-25 disk flowers. Anthers are black (Keil 1993). Plants bloom from July to November (California Native Plant Society 2001).

Holocarpha virgata ssp. *elongata* is one of two subspecies of *Holocarpha virgata*, narrow or yellow flower tarplant, that occurs in California (Keil 1993). Subspecies *elongata* differs from subspecies *virgata* based on branchlet and peduncle characters.

Habitat Description

Holocarpha virgata ssp. *elongata* occurs in chaparral, cismontane woodland, coastal scrub, and valley and foothill grassland below 2,000 feet (600 meters) (California Native Plant Society 2001). It usually occurs with nonnative grasses and forbs, while shrub cover is usually sparse (Reiser 1994). Typical habitat is on level, mildly disturbed terrain. It has also been found in heavy clay soils around vernal pools and wet meadows (Dudek and Associates 2000).

Occurrence Status

Because the California Native Plant Society (2001) categorizes *Holocarpha virgata* ssp. *elongata* as a List 4 (limited distribution rather than rare), there are no occurrence records tracked in the California Natural Diversity Database. Reiser (1994) reports locations in around Lake Henshaw, Otay Lake, Proctor Valley, Aliso Canyon Road, west of the Miramar Landfill, disturbed areas of the Pauma Valley, throughout Peñasquitos canyon west of Black Mountain Road, Cuyamaca Lake, Otay Valley, Sweetwater Reservoir, Tenaja Road and east of Squaw Mountain on the Santa Rosa Plateau. In Riverside County it grows southwest of Cherry Street in Temecula, and south of Polly Butte near Hemet in open grasslands. Occurrences of *Holocarpha virgata* ssp. *elongata* are not monitored on National Forest System lands.

Threats

Holocarpha virgata ssp. *elongata* is threatened by urbanization and development on private lands (Reiser 1994).

Conservation and Management Considerations

Because *Holocarpha virgata* ssp. *elongata* is not considered rare, no conservation measures are recommended.

Evaluation of Current Situation and Threats on National Forest System Lands

The Cleveland National Forest does not monitor this species. *Holocarpha virgata* ssp. *elongata* is found in a wide variety of vegetation types usually with nonnative grasses and forbs, while shrub cover is usually sparse. Some disturbance is tolerated (Reiser 1994). One population is in a Wilderness. Vulnerability of *Holocarpha virgata* ssp. *elongata* on National Forest System lands is considered to be low, and no risks to this taxon from Forest Service activities have been identified.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon in the Plan area with no substantial threats to persistence or distribution

from Forest Service activities.

Viability Outcome For National Forest System Lands

The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Holocarpha virgata* ssp. *elongata*. Variations in land use designations would not alter this current situation, and the various emphases of the alternatives would not result in a substantial change in conditions for *Holocarpha virgata* ssp. *elongata*. *Holocarpha virgata* ssp. *elongata* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Lands within Range of Taxon

California Native Plant Society (2001) placed this species on its List 4, “plants of limited distribution.” List 4 plants are not rare, rather have limited or infrequent distribution, with a low vulnerability or susceptibility to threats (California Native Plant Society 2001). *Holocarpha virgata* ssp. *elongata* is considered to be at risk of extirpation in a portion of its range but is found in sufficient numbers and distributed widely enough that the potential for extinction is low (California Native Plant Society 2001). This species is presumed to be declining in San Diego and Riverside counties (Reiser 1994). Its late flowering period may help account for the limited herbarium collections. Where this species is found on disturbed or overgrazed grasslands, it usually occurs in the thousands (Reiser 1994). By maintaining the current distribution of *Holocarpha virgata* ssp. *elongata* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Holocarpha virgata* ssp. *elongata* to suffer a decline in its overall distribution.

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Heuchera parishii

Horkelia cuneata ssp. puberula

Horkelia cuneata ssp. puberula

Horkelia cuneata Lindl. ssp. *puberula* (Greene) Keck (Mesa horkelia)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G4T2, S2.1 – very threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-3-3

General Distribution

Horkelia cuneata ssp. *puberula* is found in the Outer South Coast Ranges and the South Coast Range (Ertter 1993), in Los Angeles, Riverside, Santa Barbara, San Bernardino*, San Diego*, San Luis Obispo, and Ventura* counties (* = extirpated in these counties according to California Native Plant Society, 2001). There are however, two recent records for Ventura County (White 2004).

In San Luis Obispo County, Hoover (1970) described the range of this taxon (then known as *Potentilla kelloggii* var. *puberula*) as "in dry sandy places, upper Salinas Valley from vicinity of Atascadero southward, and in southern coastal area from Indian Knob ridge (north of Pismo Beach) southward."

Distribution in the Planning Area

Smith (1998) mentions two locations where *Horkelia cuneata* ssp. *cuneata* is found on the Los Padres National Forest (Manzana Creek and Miranda Pine Mountain) and he also states that the some of the collected material from Santa Barbara County has individuals that represent intermediates with *Horkelia cuneata* ssp. *puberula*. Smith does not mention whether the material collected from Manzana Creek and Miranda Pines has intermediates; i.e., whether *Horkelia cuneata* ssp. *puberula* is present or not. CalFlora (2002) includes one record for *Horkelia cuneata* ssp. *puberula* that is for a collection made adjacent to Los Padres National Forest at Cuesta Grade in San Luis Obispo County. *Horkelia cuneata* ssp. *puberula* is also documented from Los Padres National Forest at Cuesta Ridge with occurrence number 1016 JEPS, collected by Taylor (Painter 2004). For additional information on studies done on Cuesta Ridge prior to 1976, see Bollong 1976 (Painter 2004). More information is needed on the Cuesta

Ridge occurrence prior to acknowledgement that this taxon is present and does not represent intermediates.

Taxonomy and Natural History

Horkelia cuneata ssp. *puberula* is a dicot on the rose family (Rosaceae). The key characters used to separate *Horkelia cuneata* ssp. *puberula* from its closely related subspecies are its glandular hairs, open inflorescence, filament bases that are 0.5 to 2.0 mm wide, and an inner hypanthium rim that is more or less glabrous (Ertter 1993, Matthews 1997).

Horkelia cuneata ssp. *puberula* is a perennial herb that flowers from February to September (California Native Plant Society 2001).

Habitat Description

Horkelia cuneata ssp. *puberula* occupies sandy or gravelly areas in chaparral, cismontane woodland, and coastal scrub. The elevation range of this subspecies is 230 to 2,660 feet (70-810 meters) (California Native Plant Society 2001).

Occurrence Status

Until the Painter report in 2004 of the Cuesta Ridge occurrence documented by Taylor, there have been no known occurrences of *Horkelia cuneata* ssp. *puberula* on National Forest System lands. While this collection is not in doubt, additional information is needed on the location and status of the Cuesta Ridge occurrence.

Threats

This taxon is threatened by development on private lands along the coast and inland valleys, mesas, and hills of southern California. (California Native Plant Society 2001). Many historical occurrences have been extirpated [only eight of the 37 quads that are listed for *Horkelia cuneata* ssp. *puberula* support extant occurrences (California Native Plant Society 2001)]. The California Native Plant Society (2001) considers *Horkelia cuneata* ssp. *puberula* to be endangered throughout its range.

Conservation and Management Considerations

More information is needed to determine if *Horkelia cuneata* ssp. *puberula* occurs on the Los Padres National Forest. Survey and study of the Cuesta Ridge occurrence is high priority. *Horkelia cuneata* ssp. *puberula* is known to intergrade with other subspecies and the populations representing the true *Horkelia cuneata* ssp. *puberula* are declining (California Native Plant Society 2001).

Evaluation of Current Situation and Risk on National Forest System Lands

Horkelia cuneata ssp. *puberula* is not known to occur on National Forest System lands but unsurveyed potential habitat is present at several locations on the Los Padres National Forest. Until further information can be acquired regarding the Cuesta Ridge occurrence, this taxon will retain the threat category given in the Draft Environmental Impact Statement.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Horkelia cuneata* ssp. *puberula* are known to occur on National Forest System lands (see exception above), but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Horkelia cuneata* ssp. *puberula*.

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**Holocarpha virgata ssp.
elongata**

Horkelia cuneata ssp. sericea

Horkelia cuneata ssp. sericea

Horkelia cuneata Lindl. ssp. *sericea* (Gray) Keck (Kellogg's horkelia)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G4T1, S1.1 – very threatened (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Horkelia cuneata ssp. *sericea* ranges from Marin County* in the north, south through Alameda*, San Francisco*, San Mateo, Santa Cruz, Monterey, San Luis Obispo, and Santa Barbara counties (* = extirpated in these counties according to California Native Plant Society Inventory, 2001).

Distribution in the Planning Area

Horkelia cuneata ssp. *sericea* is not known to occur on National Forest System land. Smith (1998) mentions intermediate forms of the subspecies being present with *Horkelia cuneata* ssp. *cuneata* in areas north of Jualachichi Summit in northwestern Santa Barbara County but makes no specific mention of observations from the Los Padres National Forest. CalFlora (2002) has 31 records for Monterey County, 7 for Santa Barbara County, and 8 for San Luis Obispo County but none of these 46 records are from the Los Padres National Forest. There are 36 records in the California Natural Diversity Database (2002) for *Horkelia cuneata* ssp. *sericea*. None of these 36 records are from the Los Padres National Forest. The best available information that *Horkelia cuneata* ssp. *sericea* may be found on the Los Padres National Forest is from Matthews (1997) who indicates that this subspecies is found along the Coast of Monterey County; however, this may be in reference to known occurrences near Fort Ord and not the portions of coastal Monterey County that are found within the boundaries of the Los Padres National Forest.

Taxonomy and Natural History

Horkelia cuneata ssp. *sericea* is a dicot on the rose family (Rosaceae). The key characters used to

separate *Horkelia cuneata* ssp. *sericea* from its closely related subspecies are its lack of glandular hairs and the presence of a dense inflorescence and dense silky pubescent hairs that are ascending to appressed especially on the leaflets (Ertter 1993, Matthews 1997).

Horkelia cuneata ssp. *sericea* is a perennial herb that flowers from April to September (California Native Plant Society 2001).

Habitat Description

Horkelia cuneata ssp. *sericea* occurs in sandy or gravelly openings in closed-cone coniferous forest, chaparral (maritime), and coastal sage scrub at elevations between 33 and 660 feet (10-200 meters) (California Native Plant Society 2001).

Occurrence Status

There are no known populations of *Horkelia cuneata* ssp. *sericea* on National Forest System lands.

Threats

Horkelia cuneata ssp. *sericea* is threatened by development on private lands along the coastal valleys, mesas, and hills of central and northern California (California Native Plant Society 2001). Many historical occurrences have been extirpated [only 14 of the 27 quads that are listed for *Horkelia cuneata* ssp. *sericea* support extant occurrences (California Native Plant Society 2001)] and the California Native Plant Society (2001) considers *Horkelia cuneata* ssp. *sericea* to be endangered throughout its range.

Conservation and Management Considerations

More information is needed to determine if Kellogg's horkelia occurs on the Los Padres National Forest. *Horkelia cuneata* ssp. *sericea* is known to intergrade with other subspecies and the remaining plants are less distinct from *Horkelia cuneata* ssp. *cuneata* than those plants formerly found near San Francisco (California Native Plant Society 2001).

Evaluation of Current Situation and Risk on National Forest System Lands

Horkelia cuneata ssp. *sericea* may occur on the Los Padres National Forest based on the presence of known occurrences to the north and south of the Monterey Ranger District.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Horkelia cuneata* ssp. *sericea* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Horkelia cuneata* ssp. *sericea*.

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Horkelia truncata

Horkelia truncata Rydb. (Ramona horkelia)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3, S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-2

General Distribution

Horkelia truncata, Ramona horkelia, is endemic to the Peninsular Ranges of San Diego County and Baja California, Mexico (California Native Plant Society 2001, Ertter 1993).

Distribution in the Planning Area

Within National Forest System lands, *Horkelia truncata* occurs on the Cleveland National Forest on all three Districts (Palomar, Trabuco, and Descanso). Plants occur in large numbers at Black Mountain, Lawson Peak, and Margarita Peak (Cleveland National Forest records).

Taxonomy and Natural History

Horkelia truncata is a tufted, herbaceous perennial in the rose family (Rosaceae). Stems are 20-60 cm with leaves 4-13 cm. Leaflets are 1-3 per side, separated, 10-30 mm, oblong to obovate, generally greater than 20, toothed less than ¼ to midvein, more or less glabrous. The terminal leaflet is largest and generally lobed. The inflorescence is open, 5-20 flowered with pedicles generally 4-20 mm. Petals are white, 5-7 mm, round (Ertter 1993). Plants bloom from May to June (California Native Plant Society 2001).

Habitat Description

Horkelia truncata occurs on clay soils derived from gabbro along vernal streams and disturbed areas in

mixed chaparral and cismontane woodlands at elevations of 1,300–4,225 feet (400–1,300 meters) (USDA Forest Service 1998, California Native Plant Society 2001).

Occurrence Status

The California Natural Diversity Database (CNDDDB) has 28 occurrences records for *Horkelia truncate* (California Natural Diversity Database 2004). Six occurrences are on private or lands of unknown ownership. Most of the private land occurrences need population status verification. Other occurrences are protected on Pendleton Marine Corps Base (Department of Defense), Bureau of Land Management, and California Department of Fish and Game lands. The majority of the occurrences are on National Forest System lands on the Cleveland National Forest, having 19 of the 29 occurrences recorded in the CNDDDB. The Cleveland National Forest has 29 occurrence records at 12 different geographic locations.

Populations are stable on the Cleveland National Forest.

OCCURRENCE DATA of *Horkelia truncate* (Ramona Horkelia) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
2	2-1? (no paper record)	U	1977	Viejas Mt. / CNF	SD
3	2-1a	U	1997	Hidden Glen / CNF	SD
3	2-1b	U	1938	Hidden Glen /CNF	SD
U	2-2	U	1945	Lawson Peak / CNF	SD
4 ?	2-3	U	1936	El Cajon Mt. / CNF	SD
8	2-4	U	1986	Black Mt. / CNF	SD
8	2-5	U	1986	Black Mt. / CNF	SD
8	2-6	U	1986	Black Mt. / CNF	SD
8	2-7	U	1986	Black Mt. / CNF	SD
8	2-8	U	1986	Black Mt. / CNF	SD

8	2-9	U	1986	Black Mt. / CNF	SD
8	2-10	U	1986	Black Mt. / CNF	SD
8	2-11	U	1986	Black Mt. / CNF	SD
8	2-12	U	1986	Black Mt. / CNF	SD
*	2-13	U	U	Black Mt. / CNF	SD
11	2-14	20	U	Palomar Observatory / CNF	SD
13	2-15	200	1986	Boulder Creek Rd. / CNF	SD
14	2-16	50	1986	Boulder Creek/CNF	SD
17	2-17	10	1987	Chiquito Peak / CNF	SD
19	*	U	2001	El Cajon Mt	SD
9	2-18	50	1977	Northern Middle Ridge / CNF	SD
*	2-19	25	1991	Lusardi / CNF	SD
27?	2-20	200	1992	Margarita Peak / CNF	SD
26	2-21	2,000	1992	Margarita Peak / CNF	SD
24	2-22	2,000	1992	Margarita Peak / CNF	SD
25	2-23	2,000	1992	Margarita Peak / CNF	SD
20	2-24	1000	1994	El Cajon Mt. / CNF	SD
5	2-25	100	1993	El Cajon Mt / CNF	SD

23	2-26	100	1995	Temescal Creek / CNF	SD
16	2-27	50	2001	Lawson Peak / CNF	SD
15	2-28	530	2001	Lawson Peak / CNF	SD
*	2-29	30	2002	Prisoner Creek / CNF	SD

- *U = Unknown.*
- ** = an occurrence number has not been assigned.*
- *CNF = Cleveland National Forest*
- *SD = San Diego County*

Threats

Several locations of *Horkelia truncata* are affected by recreation use such as mountain climbing and hiking. Occurrences could also potentially be affected by mining activities, road maintenance, chaparral management, and livestock grazing (Stephenson and Calcarone 1999). The majority of the Cleveland National Forest occurrences are roadside. However, *Horkelia truncata* tolerates fire and moderate soil disturbances and appears to colonize openings and disturbed areas (Reiser 1994; USDA Forest Service 1998).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Horkelia truncata*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Road maintenance activities should not occur during flowering period (May to June) and pushing soil debris onto and over plants.
- Allow wildland fires to freely burn on through populations. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks and roads, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. The use of hand line for fuel break construction is preferred.

Evaluation of Current Situation and Threats on National Forest System Lands

Populations of *Horkelia truncata* are fairly large and well distributed on the Cleveland National Forest. *Horkelia truncata* is considered to have low vulnerability on National Forest System lands. Populations can tolerate fire and moderate soil disturbances, and the species appears to colonize openings and

disturbed areas. Population trends for *Horkelia truncata* appear stable on National Forest System lands. Forest Service activities do not present a substantial threat to the distribution or persistence of this species.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Horkelia truncata is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Horkelia truncata* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Horkelia truncata* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Horkelia cuneata ssp. sericea	Horkelia wilderae
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Horkelia wilderae

Horkelia wilderae Parish (Barton Flats horkelia)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G1; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Horkelia wilderae is endemic to the Barton Flats area of the San Bernardino Mountains, where it occurs over an area of approximately 12 square miles (31 square kilometers) in San Bernardino County. Occurrences are situated between the Santa Ana River and the San Gorgonio Wilderness.

Distribution in the Planning Area

All reported occurrences of *Horkelia wilderae* are within the San Bernardino National Forest, however it is likely that this species also occurs within private in holdings in the Barton Flats area.

Taxonomy and Natural History

Horkelia wilderae is a dicotyledonous plant in the rose family (Rosaceae). This perennial herb flowers from May to September (California Native Plant Society 2001).

Plants form a rosette with a generally simple caudex. The stems are generally decumbent and 10-25 cm. Leaves are 4-10 cm 4-7 leaflets per side. The leaflets are separated, 3-10 mm, more or less obovate, divided $\frac{1}{2}$ - $\frac{3}{4}$ to the base into 5-15 lobes with more or less sparse hairs. The basal rosette superficially resembles a large *Erodium* sp.

The inflorescence is open, generally 5-15 flowered with 3-15 mm pedicels that are more or less recurved in fruit. The hypanthium width is approximately 2-3mm, about two times the length. Bractlets are

generally less than 0.5 mm wide, lanceolate to ovate. The sepals are about 2 mm, the petals are 2-3 mm, oblanceolate to oblong, and the filaments are 0.5-1 mm with bases 0.5-1mm wide. Anthers are about 0.4 mm, and there are less than five pistils with styles 1-1.5 mm. The fruit are about 2 mm (Ertter 1993).

Habitat Description

Horkelia wilderae grows in montane coniferous forests and the edges of *Ceanothus cordulatus/Quercus kelloggii* dominated woodlands, at elevations of 6,000-9,850 feet (1,830-3,000 meters) (California Native Plant Society 2001; California Natural Diversity Database 2004). Plants are associated with rocky north-facing openings that hold persistent snow (California Natural Diversity Database 2004). This species is a low-lying perennial that occupies openings within mixed conifer (*Abies concolor/Calocedrus decurrens/Pinus jeffreyi*)-oak forests and is apparently associated with areas holding persistent snowdrifts such as the shaded side of an opening on a slight north-facing slope. It does not generally occur on flatter areas of the Barton Flats bench or occupy habitats with a deep litter layer (Bio-Tech Environmental Analysis 1981). The Barton Flats area consists of fanglomerate surficial sediments, somewhat consolidated alluvial deposits, probably of Pleistocene origin (Dibblee 1964).

The Barton Flats area containing suitable *Horkelia wilderae* habitat is heavily used for recreational activities, including picnic areas, organizational camps, campgrounds, and recreational residence tracts. Construction of these areas and related buildings has eliminated some habitat and continues to result in habitat degradation. However, *Horkelia wilderae* sometimes occurs within disturbed areas, such as abandoned logging road cuts and horse trails, and around recreational residence cabins, so most uses in this area are not believed to threaten occurrences with extirpation (Bio-Tech Environmental Analysis 1981).

Occurrence Status

All reported occurrences are presumed extant and have been documented or revisited on or after 1979. Population size is unknown for most occurrences, but some occurrences consist of several colonies.

The California Natural Diversity Database lists five occurrences of *Horkelia wilderae*. Two occurrences contain multiple colonies, supporting more than 1,000 plants. Two occurrences (occ. nos. 5, 6) are in the San Geronio Wilderness, above the Barton Flats bench area at Poopout Hill and west of Grinnell Mountain, (California Natural Diversity Database 2004). In 2002, a new occurrence was found at Camp Metoche. This occurrence represents a minor range extension to the north for this species. The SBNF sensitive plant atlas shows many smaller occurrences throughout Barton Flats not specifically listed in the CNDDDB.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Horkelia wilderae* (Barton Flats horkelia)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1977,1981	Frog Creek Drainage E of Horse Meadows, near trail to Poopout Hill. SBNF.	SBD
3	600-1200+ (1000's)	1981-1992 (2005)	Barton Flats, both sides of Hwy. 38. Numerous colonies scattered from Camp Round Meadow in the west and Horse Meadows in the SE to 0.5 mi. N of Barton Flats Campground in the north to Camp Edwards in the east. Threatened by OHV's and timber operations. SBNF.	SBD
4	U	1937, 1981, 1983	South of Big Meadows and Heart Bar Campground, east of Fish Creek. SBNF.	SBD
5	U	1981 2004	Poopout Hill, on and near South Fork Trail, SBNF-San Gorgonio Wilderness.	SBD
6	U	1977, 1979	W slope of Grinnell Mtn. about 1 air mile from summit. SBNF-San Gorgonio Wilderness.	SBD
*	201	2002	E side of Camp Metoche, adjacent to eastern boundary marker. Ponderosa pine forest. On bench at toe of S slope of Santa Ana Canyon. w/ <i>Poa secunda</i> , <i>Poa fendleriana</i> ssp. <i>longiligula</i> , <i>Arabis holboellii</i> var. <i>pinetorum</i> , <i>Antennaria dimorpha</i> , <i>Bromus tectorum</i> , <i>Lesingia filangifolia</i> var. <i>filangifolia</i> . In an area w/ low disturbance/use. SBNF.	SBD

*	U	2004	S. of Santa Ana River	SBD
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- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Occurrences around Barton Flats are threatened by high levels of recreation use. Many of the occurrences are in areas that are disturbed, such as campgrounds, organization camps, areas surrounding cabins, around Jenks Lake, along trail edges, along road edges and road berms, and at the base of sign posts (Lardner pers. comm.). Occurrences near trails and campgrounds may be at risk from disturbance associated with recreational use and maintenance of road and utility corridors. The two occurrences within the San Gorgonio Wilderness may be somewhat protected because of limitations on recreational use; however, one of these occurrences is along a trail. Off-road vehicle use in the area is light.

Timber harvest activities may also pose a threat (California Native Plant Society 2001, California Natural Diversity Database 2004); however, *Horkelia wilderae* appears somewhat tolerant to surface disturbance created by drag lines or slash piles. In some areas, plants were found thriving on north-aspect banks of logging road cuts and drainage ditches. Selective harvest or thinning may open up habitat for *Horkelia wilderae*. (Bio-Tech Environmental Analysis 1981). *Horkelia wilderae* appears to be more abundant in open areas, and some occurrences appear to have declined when the canopy cover becomes too dense. As of 2005, a small portion of occupied habitat has been affected by vegetation management activities completed to manage fuels within the Wildland Urban Interface. A small portion of occupied habitat also burned in a June 2005 wildfire.

Conservation and Management Considerations

The primary short-term conservation strategy for *Horkelia wilderae* is to improve the knowledge of its distribution and protect localities where threats are most pronounced. Another strategy is to monitor the effects of timber stand treatments proposed for areas of this species' habitat. The following is a list of conservation practices that should be considered for this species:

- Survey all new occurrences of *Horkelia wilderae* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Monitor occurrences affected by vegetation management treatments and the 2005 wildfire area to document ecological response, and survey treatment areas in suitable for new/undiscovered occurrences a few years after treatments are implemented.
- Collect a herbarium voucher specimen of *Horkelia wilderae* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least

ten years prior.

- Map known and new occurrences of *Horkelia wilderae* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Horkelia wilderae is a narrow-endemic, known only from the Barton Flats area of the SBNF. While none of these occurrences are fully protected from identified threats, this species has shown a tolerance for moderate levels of disturbance.

Based on the above analysis, *Horkelia wilderae* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Horkelia wilderae is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Horkelia wilderae* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Horkelia wilderae* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Horkelia truncata

Horkelia yadonii

Horkelia yadonii

Horkelia yadonii B. Ertter (Santa Lucia horkelia)

Management Status

Federal: None

California: None

Heritage Rank: G3 S3.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 4 R-E-D Code 1-2-3

General Distribution

Horkelia yadonii is known from Monterey, Santa Barbara, and San Luis Obispo Counties in the northern and southern Santa Lucia Ranges, and from the vicinity of Big Pine and Mission Pine Mountains in the southern Los Padres region (CalFlora 2002, Stephenson and Calcarone 1999).

Distribution in the Planning Area

Horkelia yadonii is known from the Los Padres National Forest and adjacent lands and is documented from Fort Hunter Liggett by several specimens collected during Fort Hunter Liggett floristic survey (Painter 2004). *Horkelia yadonii* has been collected from near Ventana Double Cone, at Tassajara Hot Springs, and along Arroyo Seco Road (Hanging Valley), in Monterey County; on the northeast spur of Black Mountain, near Navajo Campground, and near American Canyon, in San Luis Obispo County; and on Big Pine Mountain and in Mission Pine Basin, in Santa Barbara County (Ertter 1993A, Matthews 1997, Smith 1998).

Taxonomy and Natural History

Horkelia yadonii is a dicot in the rose family (Rosaceae). It is easily confused with several other species, including *H. cuneata* ssp. *sericea*, *H. rydbergii*, and *H. tenuiloba*, but has spreading hairs, larger flowers and leaflets, and leaflets with a well-developed central notch (Ertter 1993A).

Horkelia yadonii is a rhizomatous perennial herb (Ertter 1993B) that generally flowers April–July (California Native Plant Society 2001).

Habitat Description

Horkelia yadonii occurs in seeps, sandy meadow edges, and seasonal streambeds in chaparral, foothill pine woodland, broad-leaved upland forest, and riparian woodland at elevations of 1,150-6,230 feet (350-1,900 meters) (Ertter 1993A, California Native Plant Society 2001). Within the species' range, these habitats are uncommon and widely disjunct (Ertter 1993).

Occurrence Status

Horkelia yadonii is considered to be at risk of extirpation in a portion of its range but is found in sufficient numbers and wide enough distribution that the potential for extinction is low (California Native Plant Society 2001). No information is available for population trends on National Forest System lands.

Threats

Because habitat for *Horkelia yadonii* occurs in sites favored for campgrounds and off-road vehicle trails, vehicle traffic and recreational activities possibly threaten this species (Ertter 1993A). Feral pigs have also been observed to wallow where one population occurs (Ertter 1993A).

Conservation and Management Considerations

Conduct surveys to relocate historic occurrences (Navajo Campground, American Canyon, Black Mountain, Big Pine Mountain, Mission Pines Basin, Hanging Valley, Ventana Double Cone, and Tassajara) on the Los Padres National Forest and to determine the status of plants and habitat.

Evaluation of Current Situation and Risks on National Forest System Lands

Horkelia yadonii is uncommon and may be threatened at several locations by dispersed recreation and off highway vehicle use.

Based upon the above analysis *Horkelia yadonii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Habitat for *Horkelia yadonii* has been fragmented to a small degree on National Forest System land by road and campground construction and by associated uses, but there is currently sufficient habitat to allow the species occurrences to remain stable and this would continue under Alternatives 1, 2, 3, 4, 4a, and 6. Under Alternative 4 and 4a there is a moderate likelihood that conflicts between recreation use and habitat needs would be resolved in the area around Navajo Campground and the resulting improvement in habitat protection would help ensure the continued existence of this occurrence. In 4a, the higher emphasis on management of dispersed use would provide a higher level of protection but not enough to increase the viability outcome to the highest rating (an A). Under Alternative 5 there would be an increased emphasis on motor vehicle based recreation use and this increased use could result in further fragmentation of habitat for *Horkelia yadonii*, especially in those areas where road and motorized trail densities are already high, such as in the Pozo – La Panza OHV area on the Santa Lucia Ranger District.

Viability Outcomes For All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Development of private lands in Monterey, San Luis Obispo, and Santa Barbara counties has resulted in lost habitat for *Horkelia yadonii*. However, the bulk of remaining habitat is on National Forest System land and under all alternatives this habitat is expected to be sufficient to allow for the continued persistence of *Horkelia yadonii*.

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Horkelia wilderae

Hulsea californica

Hulsea californica

Hulsea californica T. & G. ex Gray (San Diego sunflower)

Management Status

Federal: None (historically on sensitive list)

California: Endangered

Heritage Rank: G2, S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Hulsea californica, San Diego sunflower, is endemic to the Cuyamaca and Laguna Mountains of San Diego County (Wilken 1993).

Distribution in the Planning Area

Within the Southern California National Forest System lands, *Hulsea californica* is known from the Cleveland National Forest (CNF) in the Palomar and Descanso Ranger Districts at over 25 locations. The majority of these occurrences are located in the Laguna Mountains (Cleveland National Forest records).

Taxonomy and Natural History

Hulsea californica is monocarpic, meaning that it lives two to three years before flowering, bears fruit only once and then dies (Painter 2004). It is in the sunflower family (Asteraceae), grows 1.5 – 4 feet tall, and has woolly and more or less glandular stems. Basal leaves are 6-10 cm. Inflorescence heads are radiate, about 20 mm in length and 20 mm wide. Phyllaries are 9-14 mm, linear-lanceolate, and long-acuminate. Ray flowers are 22-40 having corollas of 15-20 mm long, 3-5 mm wide, yellow, and pubescent (Wilken 1993). Plants flower from April to June (California Native Plant Society 2001).

Hulsea californica is a fire follower (Reiser 1994).

Occurrences at Hot Springs Mountain appear to intergrade with *H. vestita* ssp. *callicarpha* (beautiful hulsea) (Stephenson and Calcarone 1999).

Habitat Description

Hulsea californica appears in open areas after fires and mild ground disturbances in montane coniferous forest, chaparral, and pine-oak woodlands at elevations of 3,200–6,600 feet (915–2,915 meters) (California Native Plant Society 2001). Mottsville loamy coarse sand is mapped for one disturbed location in Pine Valley (Reiser 1994).

Occurrence Status

The California Natural Diversity Database reports 28 occurrences of *Hulsea californica* (California Natural Diversity Database 2004). Five of the occurrences are on private lands and the remaining occurrences are on Bureau of Land Management, Rancho Cuyamaca State Parks, and Cleveland National Forest lands (California Natural Diversity Database 2004). In addition, several "occurrences from Cuyamaca Peak, Lost Valley and Palomar Mountain previously identified as *Hulsea vestita* ssp. *callicarpa* are based on misidentifications of *Hulsea californica*" (Painter 2004). These locations have been added to the table below.

OCURRENCE DATA of *Hulsea californica* (San Diego sunflower) on National Forest System lands Threats

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
8, 9	2-1	5	1990	Laguna Junction / CNF	SD
9	2-2(same as 2-1?)	U	U	Laguna Junction / CNF	SD
*	2-3	U	U	Mt. Laguna / CNF	SD
4	2-6	U	1979	Glenclyff Fire station / CNF	SD
5	2-7	U	U	Buckman Springs / CNF	SD
*	2-8	U	U	Cottonwood Valley / private	SD

*	2-9(<i>in atlas only no paper record</i>)	U	U	Corte Madera / CNF	SD
10	2-10	U	1979	So. of Monument Peak / CNF	SD
*	2-11	U	U	Garret Peak / CNF	SD
*	2-12	U	U	Sunrise Hwy. N of Pioneer Mail area / CNF	SD
12	2-13	U	U	Laguna Mt. / private	SD
*	2-14	U	U	Sunday School Flats / private	SD
*	2-15	U	U	Agua Tibia Wilderness ? / CNF (<i>probably mis-mapped</i>)	SD
*	2-16	10	1981	Pine Creek / CNF	SD
*	2-17	2	1980	Laguna Mt / CNF	SD
7	*	U	1977	Fred Canyon / CNF	SD
11	*	1	1986	Filaree Flat / CNF	SD
13	*	2	1979	Pioneer Mail area / CNF	SD
28	*	U	1944	Espinosa Trail / CNF	SD
*	*	2	1981	Kitchen Ck / CNF	SD
*	*	15	1981	Sheepshead Mt / CNF	SD
*	*	3	1983	Noble Canyon / CNF	SD

*	*	100-1000	1983	Thing Valley Road / CNF	SD
*	*	1	1983	Mt Laguna AFB / CNF	SD
*	*	1-10	1983	Scove Cyn / CNF	SD
*	*	10-50	1983	Antone Cyn / CNF	SD
*	*	11-50	1983	Pine Valley / CNF	SD
*	*	2	1983	Pine Valley / CNF	SD
*	*	11-50	1982	Fred Canyon / CNF	SD
*	*	U	U	Cuyamaca Peak. Formerly identified as <i>Hulsea vestita</i> . spp. <i>callicarpha</i> (Painter 2004).	SD
*	*	U	U	Lost Valley. Landowner unknown. (Reiser 1994). Formerly identified as <i>Hulsea vestita</i> ssp. <i>callicarpha</i> (Painter 2004).	SD
*	*	U	U	Palomar Mt. (Reiser 1994). Formerly identified as <i>Hulsea</i> <i>vestita</i> ssp. <i>callicarpha</i> (Painter 2004).	SD

- U = Unknown
- * = an occurrence number has not been assigned
- CNF = Cleveland National Forest
- SD = San Diego County

Increased recreation use in the Laguna Mountains may affect habitat for *Hulsea californica* (Stephenson

and Calcarone 1999). Fire suppression may also have adverse affects, as the species appears to rely on natural fire cycles for regeneration (Reiser 1994).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Hulsea californica*:

- Implement prescribed fire planning to include known occurrences throughout Laguna Mountain.
- Monitor and survey potential habitats following fires.

Evaluation of Current Situation and Risk on National Forest Systems Lands

Hulsea californica is endemic to the Laguna and Cuyamaca Mountains, but it is reasonably well distributed within its range. It is a fire-follower, and it also appears after mild ground disturbance. While recreation activities in the Laguna Mountain area probably affect portions of its habitat, the ground disturbance may be partially beneficial by creating open ground for seed germination. No Forest Service activities have been identified that present a substantial threat to this species.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon endemic, but well distributed where found, in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Hulsea californica* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Hulsea californica* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Horkelia yadonii

Hulsea vestita ssp. callicarpha

Hulsea vestita ssp. callicarpha

Hulsea vestita A. Gray ssp. *callicarpha* (H.M. Hall) Wilken (Beautiful hulsea)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G5T3; S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-3

General Distribution

Hulsea vestita ssp. *callicarpha* is endemic to the northern Peninsular Ranges (Wilken 1993). Its distribution includes San Diego and Riverside counties (Reiser 1994).

Distribution in the Planning Area

Hulsea vestita ssp. *callicarpha* has been reported from fewer than 15 occurrences in the San Jacinto, Santa Rosa, and Palomar Mountains. This taxon is known to occur on the San Bernardino National Forest (San Jacinto District only) and Cleveland National Forest (USDA Forest Service 2003). *Hulsea vestita* ssp. *callicarpha* has been reported from several locations in San Diego County, including Cuyamaca Peak, Lost Valley, and Palomar Mountain, however recent information from Dieter Wilken indicates that these were misidentifications of *Hulsea californica* (Painter 2004). In Riverside County, this plant is known from North Mountain east of Hemet, near Idyllwild, and near the turnoff to Santa Rosa Peak (Reiser 1994).

Taxonomy and Natural History

Hulsea vestita ssp. *callicarpha* is a dicotyledon in the sunflower family (Asteraceae). It is one of six subspecies of *H. vestita* and is the only subspecies occurring in the Peninsular Ranges. Generally, the subspecies of *Hulsea vestita* are separated geographically. *Hulsea vestita* ssp. *gabrielensis* occurs in the Western Transverse Ranges in the San Gabriel Mountains; *H. v.* ssp. *inyoensis* occurs in the northern desert mountains and western Nevada; *H. v.* ssp. *vestita* occurs in the Sierra Nevada Mountains; *H. v.*

ssp. parryi occurs in the San Bernardino Mountains and southwest desert mountains; and *H. v. ssp. pygmaea* occurs in the Sierra Nevada and San Bernardino Mountains. Hybrids of *Hulsea vestita* *ssp. callicarpa* and *H. heterochroma* have been collected in the San Jacinto Mountains (USDA Forest Service 2003). Wilken clarified the statement that *Hulsea vestita* *ssp. callicarpa* at Hat Springs Mountain in San Diego County is cited to intergrade morphologically with *H. californica* (Wilken 1993) by explaining this statement was created for brevity and that the literature says this population is “intermediate” (Painter 2004).

Hulsea vestita *ssp. callicarpa* is a perennial herb that blooms May–October (California Native Plant Society 2001).

Hulsea vestita are generally leafy through the lower 1/3 or 1/2 of its stems. The basal leaves are less than 8 cm, 1-3 cm wide, spoon-shaped, and woolly on the upper surface. There are few cauline leaves. The inflorescence heads are less than 15 mm and less than 12 mm wide. Inflorescence bracts are lanceolate to ovate. The phyllaries are 8-11 mm long, oblong to obovate, and acuminate. Fruit are 5-7 mm and moderately hairy. The pappus is 1-2 mm, generally more or less equal (Wilken 1993).

Hulsea vestita *ssp. callicarpa* is differentiated from other subspecies by the following characteristics: The plant is generally under 5 dm. The leaf petiole is green and generally smaller than the blade. The basal leaves are entire to weakly scalloped. The inflorescence bracts are sometimes barely woolly. Phyllary tips are green or red-tinged. Flowers are yellow to orange. Ray corollas are 6-10 mm (Wilken 1993).

There is some discrepancy about the morphological characteristics assigned to *Hulsea vestita* *ssp. callicarpa*. According to Reiser (1994), the petals of *Hulsea vestita* *ssp. callicarpa* are variable in color and are sometimes orange with a reddish hue. The phyllaries may also be moderately hairy.

Habitat Description

Hulsea vestita *ssp. callicarpa* inhabits rocky or gravelly granitic soils in chaparral and in open areas of montane conifer forest at elevations of 3,000–10,000 feet (915–3,050 m) (California Native Plant Society 2001).

Site characteristics where *Hulsea vestita* *ssp. callicarpa* is found are described as "on granitic soil of forest openings, clearings, and roadcuts " (Wilken 1975), and "mildly disturbed or rocky locales" and "may regularly occur as a fire follower " (Reiser 1994).

Occurrence Status

Population trends for *Hulsea vestita* *ssp. callicarpa* on National Forest System lands are unknown. The California Natural Diversity Database (2004) does not contain any records for this taxon.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Hulsea vestita* ssp. *callicarpa* (Beautiful hulsea) Threats

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
1330072	U	1979	Lake Hemet, 10.4 mi. from N junction w/ Hwy 74, S of Thomas Mtn. Road. Land owner: U.	RIV
1210392	U	1966	Big (Brown) Meadow, SE edge. Land owner: U.	Tulare
*	U	U	Los Coyotes Indian Reservation (Reiser 1994)	SD
*	U	U	Strawberry Creek, near Idyllwild. SBNF? (Reiser 1994)	RIV
*	U	U	Hot Springs Mountain. Los Coyotes Indian Reservation. (Reiser 1994)	SD
*	U	U	Near Aguana. Location U. (Reiser 1994)	RIV
*	U	U	Near turnoff to Santa Rosa Peak, Santa Rosa Mountains. SBNF? (Reiser 1994)	RIV

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *CNF = Cleveland National Forest*
- *SD = San Diego County*
- *RIV = Riverside County*

Specific threats to *Hulsea vestita* ssp. *callicarpha* on National Forest System lands have not been identified. *Hulsea* species are reported to be self-sterile, and are thereby dependant on pollinators for reproduction. These plants have a very narrow distribution, and any activity that affects pollinators within this taxon's habitat could also threaten the viability of this taxon (USDA Forest Service 2003). More information is needed on the population status and ecology of *Hulsea vestita* ssp. *callicarpha*.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Hulsea vestita* ssp. *callicarpha*:

- Survey all new occurrences of *Hulsea vestita* ssp. *callicarpha* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Complete element occurrence form and note site characteristics related to types and intensities of ground disturbance. Use this information to manage taxon as necessary.
- Identify pollination vector(s) and become familiar with it's/their life histories. Determine if there are threats to the vector(s) and recommend management strategies accordingly.
- Collect a herbarium voucher specimen of *Hulsea vestita* ssp. *callicarpha* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior. Get confirmation on identification.
- Map known and new occurrences of *Hulsea vestita* ssp. *callicarpha* in the planning area using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Hulsea vestita ssp. *callicarpha* is an uncommon, narrow endemic in the northern portions of the peninsular ranges. It's microhabitat is not well understood and it is dependent on unknown pollinator vectors for outcrossing. It appears to occur in locations with low levels of ground disturbance and may be a fire follower. The threat to this species at this time is perceived to be habitat loss due to fire suppression activities.

Based on this analysis, *Hulsea vestita* ssp. *callicarpha* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Hulsea vestita ssp. *callicarpha* is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Hulsea vestita* ssp. *callicarpha* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Hulsea vestita* spp. *callicarpha* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Hulsea vestita* spp. *callicarpha* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Hulsea californica

**Hulsea vestita ssp.
gabrielensis**

Hulsea vestita ssp. gabrielensis

Hulsea vestita Gray ssp. *gabrielensis* Wilken (San Gabriel Mountains sunflower)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G5T3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Hulsea vestita ssp. *gabrielensis* occurs in the mountains of Los Angeles, San Bernardino, and Ventura counties (California Native Plant Society 2001; CalFlora 2002; Magney 2002; Wilken 2002; Rancho Santa Ana Botanic Garden 2002). The 33 occurrences from Los Angeles County and the single occurrence from San Bernardino County are all found in the San Gabriel Mountains. Locations range from Magic Mountain in the west, Mt. San Antonio in the east, Santiago Canyon in the north, and Tujunga Canyon in the south. In Ventura County, two occurrences of *Hulsea vestita* ssp. *gabrielensis* are known from the summit of Frazier Mountain and near Alamo Mountain (Wilken pers.comm.; Magney 2002).

Distribution in the Planning Area

Most occurrences of *Hulsea vestita* ssp. *gabrielensis* occur on the Angeles National Forest (ANF). Locations include Pacifico Mountain, Mt. Gleason, Mt. Williamson, Charlton Flats, Tujunga Canyon, Mt. San Antonio, Mill Creek Summit, Mt. Hillyer, Upper Chilao Campground, Mt. Baden-Powell, Arrastre Canyon, Granite Mountain, Bear Divide Station, Bad Canyon, Magic Mountain, Santiago Canyon, and Mt. Waterman (Rancho Santa Ana Botanic Garden 2002). The two occurrences in Ventura County on Frazier Mountain and near Alamo Mountain are within the Sespe Wilderness of the Los Padres National Forest (LPNF).

Taxonomy and Natural History

Hulsea vestita ssp. *gabrielensis* is a perennial herb in the sunflower family (Asteraceae). The plant is

generally less than 5 dm in height. Leaf petioles are more or less red and generally shorter than the blade, and basal leaves are more or less scalloped. Bracts on the inflorescence are sometimes barely woolly, and phyllary tips are red-tinged. Ray flower corollas are 6-8 mm long and also red-tinged. Disk flowers have yellow to orange corollas (Wilken 1993). Flowering occurs May through July (California Native Plant Society 2001).

Individuals have been found in the Sierra Nevada Mountains that appear to be intermediates between *Hulsea vestita* ssp. *gabrielensis* and *Hulsea vestita* ssp. *vestita*. Individuals have also been detected in the San Bernardino Mountains that look like intermediates between *Hulsea vestita* ssp. *gabrielensis* and *Hulsea vestita* ssp. *parryi*. However, numerical analysis and review of morphological variation have indicated that populations in the western Transverse Ranges represent a discrete taxon (Wilken 1977).

Habitat Description

Hulsea vestita ssp. *gabrielensis* is found in rocky soils in open areas of montane coniferous forest between 1,500 and 2,500 meters (Wilken 1993). In the San Gabriel Mountains, occurrences grow in fine or coarse granitic loam soils (Rancho Santa Ana Botanic Garden 2002). Several occurrences exist on north or northwest-facing slopes, and several occurrences are near summits. The taxon appears to tolerate both full sun and partial shade. Associated plant communities include Jeffrey pine forest (*Pinus jeffreyi*) and Coulter pine forest (*Pinus coulteri*). The plant may also be associated with *Cordylanthus nevinii* (Rancho Santa Ana Botanic Garden 2002).

Potential habitat for *Hulsea vestita* ssp. *gabrielensis* exists in the western portion of the San Bernardino National Forest (SBNF). Some potential habitat also occurs on the north slope of the San Bernardino Mountains east of Silverwood Lake and north of Big Bear Lake.

Occurrence Status

There are two records for the taxon in the CalFlora database (CalFlora 2002). There are two reports known from Ventura County (Magney 2002; Wilken 1975, 1977), and 31 collection records from various herbaria (Rancho Santa Ana Botanic Garden 2002; Wilken pers. comm.). Although trends in abundance and distribution are unknown, the center of the distribution for *Hulsea vestita* ssp. *gabrielensis* is clearly in the central San Gabriel Mountains, with outlying occurrences on the LPNF to the north and west and on the extreme eastern portion of the ANF.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Hulsea vestita* ssp. *gabrielensis* (San Gabriel Mountains sunflower)

Occurrence ID No.	No. of Plants	Year Reported	Location/Land Owner	County
1821913 (CalFlora 2002)	U	1994	San Gabriel Mountains: Pacifico Mtn, somewhat flat granitic ridgetop ca. 860 m wnw of the 7,124' summit. 6800-6830' elev. ANF	LA
*	U	1990	San Gabriel Mountains. Little Gleason Forestry Plantation: north of Mt Gleason Road about the east headwaters of Gleason Canyon and about 2 (air) miles E of Mt Gleason summit. ANF	LA
*	U	1990	Mt Gleason area: north-northwesterly ridge descending from Messenger Peak (6015 ft) near the headwaters of Mill canyon and Moody Canyon. San Gabriel Mountains. ANF	LA
*	U	1973, 1969	Mt. Williamson, north of Islip Saddle. San Gabriel Mountains. ANF	LA
*	U	1973	Charlton Flats campground. San Gabriel Mountains. ANF	LA
*	U	1973	Upper Tujunga Canyon, along Forest Rd. 3N20, 1.5 miles west of Hwy 2. San Gabriel Mountains. ANF	LA
*	U	1973	Along Devils Backbone south side of Mt San Antonio. San Gabriel Mountains. ANF	LA
*	U	1973	Along Forest Road 3N17, 2 miles East of Mill Creek Summit, San Gabriel Mountains. ANF	LA

*	U	1990	Forest Service Road 3N27, 11.3 road miles N of Big Tujunga Canyon Rd. ca 785 m NNE of Ed Triangulation Point (4990 ft.) and ca 560 m SSW (airline) of jtn with Mt. Gleason Rd. San Gabriel Mountains. ANF	LA
*	U	1971	N slope of Mt. Hillyer. San Gabriel Mountains. ANF	LA
*	U	1969	Near Chilao Creek, Upper Chilao Campground. San Gabriel Mountains. ANF	LA
*	U	1961	State Highway #2 near Valcrest. San Gabriel Mountains. ANF	LA
*	U	1921	Trail from Pine flats to Chilao. San Gabriel Mountains. ANF	LA
*	U	1902	Acton, Mt. Gleason. San Gabriel Mountains. ANF	LA
*	U	1974	At the summit of Mt. Baden-Powell on the southern side of the peak. San Gabriel Mountains. ANF	LA
*	U	1932	Arrastre Canyon at 4600 ft. San Gabriel Mts. ANF	LA
*	U	1994	W slope, ca 860 m WSW of the 7124-ft summit. San Gabriel Mountains. ANF	LA
*	U	1991	San Gabriel Mountains, Granite Mountain vicinity: ridge NNE of Granite Mountain. ANF	LA

*	U	1974	On steep rocky slope along Forest Service road 3N17, 7.4 miles east of Bear Divide Station and 14.2 miles west of Mt. Gleason. San Gabriel Mountains. ANF	LA
*	U	1968	San Gabriel Mountains: Head of Bad Canyon at Santa Clara Divide Road. ANF	LA
*	U	1994	Santiago Canyon: N slope of Pacifico Mountain. San Gabriel Mountains. ANF	LA
*	U	1991	Magic Mtn., San Gabriel Mountains. ANF	LA
*	U	1972	Mt. Waterman near Buckhorn Station: N slope. San Gabriel Mountains. ANF	LA
*	U	1971	Devil's Backbone, Mt. San Antonio. San Gabriel Mountains. ANF	LA/SBD
*	U	1995	San Gabriel Mountains. Santiago Canyon. North slope of Pacifico Mountain, near summit. ANF	LA
*	U	1905	Summit of Frazier Mountain. LPNF-Sespe Wilderness	VEN
*	U	U	Near Alamo Mountain. LPNF-Sespe Wilderness	VEN
*	U	1973	Angeles Crest Highway, 3 mi. E of Chilao, 6000' elev. Type specimen. ANF	LA

*	U	1948	Road from La Canada to Palmdale, 16 miles past jct with Mt. Wilson Rd, 4500' elev. ANF	LA
*	U	1953	Mendenhall Ridge, 10 mi E of jct at paved rd between Little Tujunga and Pacoima Canyons, 5100' elev. ANF	LA
*	U	1958	State Highway 2 along nw shoulder of Mt. Islip, 7100' elev. ANF	LA
*	U	1930	S side of Mt. San Antonio, 8500'. ANF	LA
*	U	U	E slope of Mt. Williamson. ANF This location also was reported as <i>H. vestita</i> ssp. <i>pygmacea</i> , however vouchers have been identified as <i>H. Vestita</i> ssp. <i>gabrielensis</i> (Wilken pers. comm.).	LA
*	U	U	Near summit of Mt. Gleason, 5 mi W of Mill Crk Summit. ANF	LA
*	U	U	Mt. Baden-Powell. Angeles National Forest. (Formerly identified as <i>H. vestita</i> ssp. <i>pygmaea</i> , determined to be <i>H. v.</i> ssp. <i>gabrielensis</i> by Wilken (pers. comm.).	LA

- U = Unknown
- * = an occurrence number has not been assigned
- ANF = Angeles National Forest
- LPNF = Los Padres National Forest
- LA = Los Angeles County
- SBD= San Bernardino County
- VEN= Ventura County

Threats

Threats to occurrences of *Hulsea vestita* ssp. *gabrielensis* in the San Gabriel Mountains include trail and road maintenance and construction, dispersed recreation, and other Forest Service uses and management activities. Possible ski area development near Mt. Waterman would be evaluated at the Project level.

Potential habitat on the SBNF is threatened by trail and road maintenance and construction, dispersed recreation, possible mineral extraction activities, and other Forest Service Management activities.

Conservation and Management Considerations

The strategy for this species is to improve knowledge of distribution and occurrence status. The following is a list of conservation practices that should be considered for *Hulsea vestita* ssp. *gabrielensis*:

- Survey all new occurrences of *Hulsea vestita* ssp. *gabrielensis* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Hulsea vestita* ssp. *gabrielensis* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Hulsea vestita* ssp. *gabrielensis* in the planning area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Hulsea vestita ssp. *gabrielensis* is generally uncommon but locally common on granitic soils of the San Gabriel Mountains. The majority of the occurrences are remote and on rugged ground. In these locations the major effect to habitat is the use and maintenance of trails. No substantial effects from Forest Service activities are expected.

Based on this analysis, *Hulsea vestita* ssp. *gabrielensis* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Hulsea vestita ssp. *gabrielensis* is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Hulsea vestita* ssp. *gabrielensis* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Hulsea vestita* ssp.

gabrielensis would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Hulsea vestita* ssp. *gabrielensis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Personal communication

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Hulsea vestita ssp. callicarpha

Hulsea vestita ssp. parryi

Hulsea vestita ssp. parryi

Hulsea vestita A. Gray ssp. *parryi* (A. Gray) Wilken (Parry's sunflower)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G5T3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Hulsea vestita ssp. *parryi* is endemic to the San Bernardino Mountains and Little San Bernardino Mountains (Wilken 1993, USDA Forest Service 2002).

Distribution in the Planning Area

Hulsea vestita ssp. *parryi* occurs primarily on the San Bernardino National Forest. Some occurrences on the SBNF are on the north slope of the San Bernardino Mountains on carbonate soils. These include: near Monarch Flat, Marble Canyon, Furnace Canyon, Cactus Flat, and Blackhawk Mountain (USDA Forest Service 2002).

Taxonomy and Natural History

Hulsea vestita ssp. *parryi* is a dicotyledon in the sunflower family (Asteraceae). It is one of six narrowly distributed subspecies of *H. vestita* that occur in California, three of which occur in the Plan area. *Hulsea vestita* ssp. *parryi* is distinguished from the other primarily by leaf blade features and flower color. The distinguishing characteristics include scalloped or lobed basal leaf blades, red-tinged phyllary tips, and orange-to-red flowers (Wilken 1993).

Hulsea vestita ssp. *parryi* is a perennial herb that blooms April–August (California Native Plant Society 2001). This species is generally 2-6 dm tall. The petioles are generally larger than the blade and more or less green. The basal leaves are deeply lobed, glandular and non-glandular below. The inflorescence

bracts are sparsely woolly, and the phyllary tips are red-tinged. The flowers are orange to red. The ray corollas are 5-7 mm and more or less red (Wilken 1993).

Habitat Description

Hulsea vestita ssp. *parryi* grows on rocky, granitic soils, and talus/scree slopes, in open areas of montane coniferous forest and pinyon-juniper woodland at elevations of 4,500–9,500 feet. It also occurs on limestone soils in conifer forest and pinyon-juniper woodland in the San Bernardino Mountains (USDA Forest Service 2002).

Occurrence Status

There are ten known occurrences from the San Bernardino Mountains that were observed during carbonate monitoring plot surveys in 1998 (USDA Forest Service 2002). Many of these are in areas disturbed by past mining-related activities.

The table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Hulsea vestita* ssp. *parryi* (Parry's sunflower)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
*	> 5	1998	ca. 2/3 mi. ESE of Monarch Flat. Steep rocky slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> ssp. <i>goodmaniana</i> , <i>Arabis shockleyi</i> . Aspect 240 ° , slope 32 ° . SBNF.	SBD
*	> 5	1998	2 sites, ca. 1.3 and 1.5 mi. NW of Mohawk Mine. Rocky upper slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> ssp. <i>goodmaniana</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> , <i>Abronia nana</i> ssp. <i>covillei</i> , <i>Arabis shockleyi</i> . Aspect 72 ° , slope 34 ° . SBNF.	SBD

*	< 5	1998	ca. 0.25 mi. SW of JCT of Furnace and Wildrose canyons. Steep scree bouldery slope in old quarry w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Arabis shockleyi</i> . Aspect 140 ° , slope 60%. SBNF.	SBD
*	< 5	1998	ca. 1/3 mi. SSW of Arctic Canyon Pit. Steep rocky talus slope w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Arabis shockleyi</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . Aspect 340 ° , slope 35 ° . Near limestone quarries. SBNF.	SBD
*	< 5	1998	ca. 0.5 mi. SE of JCT of Furnace and Wildrose canyons. Mountainside above E fork of Furnace Canyon. Toe slope. Much of slope with unstable cobble-sized stones. W/ <i>Oxytheca parishii</i> ssp. <i>goodmaniana</i> , <i>Arabis shockleyi</i> . Aspect 200 ° , slope 35 ° . SBNF.	SBD
*	> 5	1998	NW of Cactus Flat, ca. 0.5 mi. WSW of Silver Peak. Rocky slope w/ <i>Astragalus albens</i> , <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> ssp. <i>goodmaniana</i> , <i>Arabis shockleyi</i> . Aspect 188 ° , slope 33 ° . SBNF.	SBD

*	> 5	1998	ca. 3 mi. NNW of Hitchcock Spring, SE of JCT of East and West forks of Dry Canyon. Ridgetop. Appears to have been cleared of vegetation at one time. W/ <i>Astragalus albens</i> , <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Arabis shockleyi</i> . Aspect 206 ° , slope 10 ° . SBNF.	SBD
*	< 5	1998	ca. 0.5 mi. SSE of Terrace Springs. Upper slope w/ <i>Astragalus albens</i> , <i>Oxytheca parishii</i> var. <i>goodmaniana</i> , <i>Abronia nana</i> ssp. <i>covillei</i> . Aspect 217 ° , slope 28 ° . SBNF.	SBD
*	< 5	1998	ca. 0.5 mi. ESE of Monarch Flat. Graelly slope above road w/ <i>Eriogonum ovalifolium</i> var. <i>vineum</i> , <i>Oxytheca parishii</i> ssp. <i>goodmaniana</i> , <i>Arabis shockleyi</i> . Aspect 246 ° , slope 20 ° . SBNF.	SBD
*	< 5	1998	2 sites, ca. 0.25 and 0.5 mi. ESE of Silver Peak, immediately above Grapevine Creek. Rocky open slope w/ <i>Oxytheca parishii</i> ssp. <i>goodmaniana</i> . Aspect 160 ° , slope 30 ° . SBNF.	SBD
*	1	2001	Between Holcomb Valley and Arrastre Flat, on small sandy alluvial terrace next to seasonal stream, just north of Forest Road 3N19	SBD
*	1	1999	Rattlesnake Canyon, on roadside of 2N02, south of Mineral Mountain.	SBD

*	?	?	Strawberry Peak, 5500'	SBD
*	?	?	Big Bear Dam, SBNF	SBD
*	?	?	Santa Ana River, 6000', SBNF	SBD
*	?	?	Barton Flats, SBNF	SBD
*	?	?	Trail to Dollar Lake, 9,500', SBNF, San Gorgonio Wilderness.	SBD
*	?	?	North Baldwin Lake, 6,900'. SBNF/ DFG	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*

Threats

On the San Bernardino National Forest, *Hulsea vestita* ssp. *parryi* may be threatened by limestone mining activities. Most of the occurrences are located near ongoing mining activities or prospecting areas (USDA Forest Service 2002). Other occurrences could be threatened by trail use and maintenance, however, this species shows a tolerance to moderate surface disturbance.

Conservation and Management Considerations

The conservation strategy for this species is to implement the Carbonate Habitat Management Strategy and to improve the level of knowledge about its distribution. The following is a list of conservation practices that should be considered for *Hulsea vestita* ssp. *parryi*:

- Implement the Carbonate Habitat Management Strategy.
- Survey all new occurrences of *Hulsea vestita* ssp. *parryi* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Hulsea vestita* ssp. *parryi* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Hulsea vestita* ssp. *parryi* in the planning area using SBNF

- data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.
- Determine site characteristics that promote regeneration and manage for them as necessary.

Evaluation of Current Situation and Threats on National Forest System Lands

Hulsea vestita ssp. *parryi* is uncommon on carbonate and granitic soils of the northern and eastern San Bernardino Mountains and the Little San Bernardino Mountains. This species is uncommon throughout its range, with most occurrences consisting of fewer than five individuals. While some of the recorded occurrences are vulnerable to identified threats, many are remote and inaccessible to vehicle impacts. Also, this species shows a tolerance for moderate levels of surface disturbance. Mining impacts will be addressed at the project level, and will be guided by provisions of the Carbonate Habitat Management Strategy.

Based on this analysis, *Hulsea vestita* ssp. *parryi* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Hulsea vestita ssp. *parryi* is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Hulsea vestita* ssp. *parryi* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Hulsea vestita* ssp. *parryi* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Hulsea vestita* ssp. *parryi* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Hulsea vestita ssp.
gabrielensis**

Hulsea vestita ssp. pygmaea

Hulsea vestita ssp. pygmaea

Hulsea vestita A. Gray. *ssp. pygmaea* (A. Gray) Wilken (Pygmy hulsea)

Management Status

Federal: None

California: None

Heritage Rank: G5T2; S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Hulsea vestita ssp. *pygmaea* has been documented from Glass mountain on the Inyo National Forest in the Sierras, and in the San Gabriel and San Bernardino mountains in California. According to Painter (2004) Dieter Wilken states that the Glass Mountain occurrences are based on misidentification of *Hulsea vestita* ssp. *vestita*. In addition, Wilken has identified the Mt. Baden-Powell and Mt. Williamson specimens in the San Gabriel Mountains (Krantz, et. al. draft 2000) as *H. vestita* spp. *gabrielensis* (Painter 2004). This information, combined with information from Dieter Wilken in 2003, results in a more restricted range for *H. vestita* ssp. *pygmaea*; it is now known only from the Kern Plateau and from Mt. San Gorgonio in the San Bernardino Mountains (Wilken pers. comm.).

Distribution in the Planning Area

Hulsea vestita ssp. *pygmaea* occurs on Mount San Gorgonio in the San Bernardino Mountains. Within this same mountain range, it is also known from Sugarloaf Ridge. Occurrences there are assumed to be this taxon until further study is completed. Both locations occur on the San Bernardino National Forest.

Taxonomy and Natural History

Hulsea vestita ssp. *pygmaea* is a dicotelydon in the sunflower family (Asteraceae). This perennial herb blooms between June and October (California Native Plant Society 2001).

Six subspecies of *H. vestita* are currently recognized. Of these, ssp. *parryi*, ssp. *pygmaea*, and ssp. *vestita* have been reported from the San Bernardino Mountains (Wilken 1993; Krantz, et. al. draft 2000).

It is now known that only *H. vestita* ssp. *parryi* and *H. vestita* ssp. *pygmaea* occur. (Wilken pers. comm.).

Hulsea vestita ssp. *pygmaea* appears most closely related to ssp. *parryi* (Wilken 1975). *Hulsea vestita* ssp. *pygmaea* occurs at higher elevations than ssp. *parryi* and has basal leaves that are entirely glandular below and deep red-purple phyllaries (Wilken 1993).

Hulsea vestita ssp. *pygmaea* plants are less than 1 dm tall. The stems are more or less leafless. The petiole is generally equal to the blade and more or less green or purplish. The basal leaves are lobed and entirely glandular below. The inflorescence is characterized by bracts that are sparsely woolly. The phyllary tips are reddish or purple. The ray flower corollas are 5-8 mm and red. The disk flower corollas are orange (Wilken 1993).

Habitat Description

Hulsea vestita ssp. *pygmaea* inhabits subalpine forests and alpine barrens at elevations of 10,500–12,800 feet (3,200–3,900 meters) (Wilken 1993; California Native Plant Society 2001).

Occurrence Status

Site-specific information is known from two occurrences of *Hulsea vestita* ssp. *pygmaea* within the planning area.

OCCURRENCE DATA – *Hulsea vestita* ssp. *pygmaea* (Pygmy hulsea)

Occurrence No.	No. of Plants	Year Reported	Location/Land Owner	County
*	U	U	San Gorgonio Peak. San Gorgonio Wilderness. San Bernardino National Forest.	SBD
*	U	U	Sugarloaf Ridge. 9900'. San Bernardino National Forest	SBD

- *U* = Unknown
- * = an occurrence number has not been assigned
- SBD = San Bernardino County

Threats

Alpine habitat is vulnerable to trampling by hikers and other forms of ground disturbance (Billings 1988), but these impacts are limited to a small number of locations around developed recreation areas, roads, and trails. Trampling and other ground disturbances resulting from hiking, rock climbing, camping, and road building have degraded some areas of alpine and subalpine plants. In general, however, alpine and subalpine ecosystems are considered to be largely intact, stable, and show little disturbance with the exception of some heavy recreation use in the immediate vicinity of trails.

This taxon appears to be naturally rare. No particular threats to *Hulsea vestita* ssp. *pygmaea* have been identified. Potential threats include impacts from recreational activities, such as dispersed camping and hiking off of designated trails. At Mt. San Gorgonio, some *Hulsea vestita* ssp. *pygmaea* plants occur in close proximity to the summit trail and campsite. Because alpine plants are slow-growing, recovery from impacts may take much longer than it would in other habitats. In the San Gorgonio Wilderness there are no extensive land disturbing impacts nor are they expected.

Occurrences on Sugarloaf Ridge may be affected by hiking and trail maintenance. These occurrences are not considered as protected as those in the designated wilderness. However, effects from planned Forest Service activities are expected to be minimal because the ridgetop is unroaded. There is potential for fire suppression activities to affect habitat during emergency situations. However, due to the large number of other rare plant species in this location, fire suppression actions are well coordinated and Wildland Urban Interface zone actions are proposed and underway to remedy this situation.

Conservation and Management Considerations

The primary strategy for the conservation of this species is to improve the knowledge of its distribution and to monitor effects of trail use and remedy as necessary. The following is a list of conservation practices that should be considered for *Hulsea vestita* ssp. *pygmaea*:

- Collect vouchers in the San Bernardino Mountains from Sugarloaf Ridge and San Gorgonio Peak (if necessary) to send to Dieter Wilken for positive identification. Amend this account and make recommendations regarding the SBNF watch list based on the identification.
- At time of voucher collection, complete element occurrence forms and identify level of site disturbance where plants are found. Use this information to determine site characteristics that promote regeneration and manage for them.

Implement the following actions as needed based on item above.

- Monitor trails where they transect occupied habitat and identify areas where off-trail foot traffic or camping is impacting this species. Install protective measures as needed.
- Survey all new occurrences of *Hulsea vestita* ssp. *pygmaea* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Hulsea vestita* ssp. *pygmaea* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been

documented in at least ten years prior.

- Map known and new occurrences of *Hulsea vestita* ssp. *pygmaea* in the southern California National Forests using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Hulsea vestita ssp. *pygmaea* is extremely rare and narrowly distributed. While some of the recorded occurrences are vulnerable to potential threats, these impacts are not expected to be frequent or severe. Most of the suitable alpine habitat for this species within the national forests of southern California is rugged and not easily accessible by cross country travel resulting in use along designated trails or the adjacent footprint. In addition, this taxon occurs within the designated San Gorgonio Wilderness and on Sugarloaf Ridge where land disturbing actions are minimal. Both locations are unroaded. *Hulsea vestita* ssp. *pygmaea* habitat faces little threat at this time.

Based on this analysis, *Hulsea vestita* ssp. *pygmaea* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Hulsea vestita* ssp. *pygmaea* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Hulsea vestita* ssp. *pygmaea* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Personal communication

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Hulsea vestita ssp. parryi

Ivesia argyrocoma

Ivesia argyrocoma

Ivesia argyrocoma (Rydb.) Rydb. (Silver-haired ivesia)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-2

General Distribution

Ivesia argyrocoma is known from Big Bear and Holcomb Valleys in the San Bernardino Mountains and from a disjunct occurrence located near Laguna Hansen, Sierra Jaurez, in Baja California Norte (USDA Forest Service 2002; California Native Plant Society 2001). The California Natural Diversity Database (2004) contains records for 24 occurrences on both public and private lands.

Distribution in the Planning Area

There are 15 occurrences of *Ivesia argyrocoma* on the SBNF (California Natural Diversity Database 2004). *Ivesia argyrocoma* occurs in most pebble plain complexes on the San Bernardino National Forest, ranging from the Coxe complex through Holcomb and Bear Valleys to Onyx Peak and Broom Flats. Occurrence 38, recorded from the Rouse Meadows area (California Natural Diversity Database 2004) near Lake Arrowhead, was relocated in 2004.

Taxonomy and Natural History

Ivesia argyrocoma is a dicotyledon in the rose family (Rosaceae). This species is a perennial herb that blooms June–August (California Native Plant Society 2001). It is distinguished from other *Ivesia* species in the San Bernardino Mountains by the prostrate stems, clustered flowers, and flat filaments, and by its occurrence in pebble plains habitat. The populations from Baja California Norte may be taxonomically distinct (Ertter 1993).

Ivesia argyrocoma is a rosetted or tufted, silvery-hairy plant with a generally simple caudex. The stems

are more or less decumbent and 10-20 cm. The leaves are generally 4-8 cm and have densely strigose sheathing bases. There are 25-35 leaflets per side, each with about 3 lobes. The leaflets are generally 2-3 mm and elliptic to obovoid. There are approximately 2 cauline leaves. The inflorescence consists of 1 to several clusters, 10-20 mm wide, that are loosely head-like, with less than 20-flowers. The pedicel is less than 3 mm (excluding the lowest) and is more or less straight. The flowers are more or less 10 mm wide. The hypanthium length is equal to the width. Petals are 2-4 mm, obovate, white, greater than the sepals, and have 20 stamens with more or less flat filaments (unique to *Ivesia*) and 4-8 pistils. The fruit are 2-2.5 mm, smooth, and brown (Erter 1993).

Habitat Description

Ivesia argyrocoma occurs in pebble plains and alkaline meadows within upper montane coniferous forests at elevations of 4,800–8,700 feet (1,480–2,680 meters) (California Native Plant Society 2001, California Natural Diversity Database 2004). This species is considered to be a strong indicator of pebble plains habitat -- while it does occasionally grow in meadow-like habitat, these areas are often transitional to pebble plains. *Ivesia argyrocoma* is noted as an early pioneer in disturbed pebble plain habitat; plants have recently been observed recolonizing water bars at the Snow Forest location and old roadbeds at other pebble plain sites.

Occurrence Status

Populations of *Ivesia argyrocoma* appear to be declining as a result of habitat loss. Populations that occur on private property are under threat of development (California Natural Diversity Database 2004, U.S. Fish and Wildlife Service 2001). Other threats to the populations include vehicle use off designated roads, unauthorized dumping, competition from nonnative undesirable grasses, and trampling (U.S. Fish and Wildlife Service 2001).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Ivesia argyrocoma* (Silver-haired ivesia)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1	U	1988	North shore of Baldwin Lake, Bear Valley. Pebble plains associated w/ <i>Arabis parishii</i> , <i>Castilleja cinerea</i> , <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> , <i>Echinocereus engelmannii</i> var. <i>munzii</i> , <i>Linanthus killipii</i> , <i>Arenaria ursina</i> , <i>Astragalus leucolobus</i> , <i>Mimulus exiguus</i> . Threats: woodcutting, quartzite theft, ORV activity, weedy spp. (<i>Bromus tectorum</i>). SBNF, DFG, PVT.	SBD
2	U	1978	Onyx Peak, from summit down NNW slope to ca. 8200'. 8200-9110'. w/ <i>Phlox dolichantha</i> , <i>Arabis parishii</i> , <i>Arenaria ursina</i> , <i>Linanthus killipii</i> . SBNF.	SBD
3	U	1988	Sugarloaf, along E edge of town to Hwy 38 and along S edge of town to water tank. Pebble plains surrounded by Jeffrey pine forest. w/ <i>Arenaria ursina</i> , <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> , several other rare plant taxa. Some pebble plains almost fully denuded of vegetation due to ORV use. Development also a threat. PVT.	SBD
4	U	1988	Sugarloaf, from NE edge of town to NE edge of Moonridge. Mostly on ridges topped by pebble plains. w/ <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> , <i>Poa incurva</i> , <i>Viola douglasii</i> , several other rare plant taxa. PVT, SBNF, TNC.	SBD

6	U	198X	Erwin Lake, Bear Valley. Nearly pristine alkaline wet meadows w/ high densities of <i>Thelypodium stenopetalum</i> , 11 other sensitive spp. Mostly undisturbed. Grazing = potential threat. PVT.	SBD
7	U	1978	South shore of Big Bear Lake. Just S of Mallard Lagoon. Historical collections. PVT.	SBD
8	U	1978	N side of Switzerland Dr., N of Pineknott Campground. w/ many other rare spp. PVT.	SBD
9	U	1988	Aspen Glen Picnic Area NW to shore of Metcalf Bay, Big Bear Lake. In meadow on clay soil w/ <i>Pinus jeffreyi</i> , <i>Artemisia arbuscula</i> , <i>Ranunculus californica austromontanum</i> , <i>Viola douglasii</i> , <i>Castilleja cinerea</i> , <i>Dodecatheon hendersonii</i> . 4 populations. Includes former occ. #10. Illegal dumping of dredge material, alteration of hydrology, development, trampling and roads are threats. SBNF.	SBD
11	U	1978	Snow Point, E of Big Bear Lake. Near ski lift. Includes occ. #12. SBNF.	SBD
13	U	1934	Bluff Lake, S of Big Bear Lake. w/ several rare plant spp. in Bluff Lake area. PVT.	SBD
15	U	1926	Bear Valley, 'near the tavern'. Dry gentle slopes under pines. Historical record. PVT.	SBD

17	U	1978	NE edge of Union Flat, San Bernardino Mountains. Incl. occs. #18, 22, 23. SBNF.	SBD
19	U	1988	About 1 mi. E of Big Bear City, slopes above Baldwin Lake. 2 populations. Pebble plain surrounded by <i>Pinus monophylla</i> and <i>Juniperus occidentalis australis</i> . w/ <i>Eriogonum kennedyi austromontanum</i> , <i>Arenaria ursina</i> , <i>Castilleja cinerea</i> , <i>Echinocereus engelmannii</i> , <i>Linanthus killipii</i> . Forest Service road crosses the two pebble plains and facilitates occasional ORV activity off classified roads. SBNF.	SBD
20	U	1978	ca. 0.5 mi. SSE of Gold Mountain summit, Bear Valley. w/ <i>Arabis parishii</i> . SBNF.	SBD
21	U	1978	Van Dusen Canyon, ca. 2.0 mi. W of Gold Mountain summit. w/ <i>Packera bernardina</i> , <i>Arabis parishii</i> , <i>Lesquerella kingii bernardina</i> . SBNF.	SBD
24	U	1979	Immediately E of Fawnskin, above Hwy 18, San Bernardino Mtns. Disturbed pebble plain in <i>Pinus jeffreyi</i> series. Rocky slope w/ <i>Arabis parishii</i> , <i>Cercocarpus ledifolius</i> . PVT.	SBD

25	U	1988	South shore of Big Bear Lake, btw. edge of Eagle Point and Stanfield Cutoff. In meadows w/ clay/ quartzite cobble soils. w/ <i>Agropyron</i> sp., <i>Artemisia tridentata</i> . Threats = development, ORV use, trampling, weeds. TNC negotiated 15 acre preserve; much of the rest to be developed. PVT.	SBD
26	U	1988	Holcomb Valley area. w/ <i>Eriogonum kennedyi austromontanum</i> , <i>Arenaria ursina</i> , <i>Castilleja cinerea</i> , <i>Arabis parishii</i> on pebble plain. Little disturbance except for roads. Incl. occs. 27, 28, 29, 30. SBNF.	SBD
31	U	1988	Lower Holcomb Valley, East Bertha ridge, upper Holcomb Valley. From Wilbur grave, SE ca. 1.4 mi. down Van Dusen Canyon. Flat w/ clay soils and no quartzite cobbles surrounded by <i>Pinus jeffreyi</i> , <i>Juniperus occidentalis</i> , <i>Artemisia tridentata</i> . w/ <i>Arenaria ursina</i> , <i>Eriogonum kennedyi austromontanum</i> . Forest Service roads and ORV use are potential threats. Incl. occs. 32, 33,34, 39. SBNF.	SBD
35	U	1990	Coxey Meadow, from road just E of meadow to hill SE of Mill Spring. Clay soils w/ quartzite cobbles. w/ <i>Arabis parishii</i> , <i>Echinocereus engelmannii</i> . ORV damage evident. SBNF.	SBD
37	U	1977	Lower Larga Flat, San Bernardino Mountains. Needs fieldwork. SBNF.	SBD

38 * (RSA)	U 2000	1978 2004	Rouse Meadow, near JCT of Squint Ranch Rd. and Rouse Ranch Rd. ca. 2 mi. E of Lake Arrowhead. w/ <i>Eriogonum wrightii</i> , <i>Pinus jeffreyi</i> on edge of tree plantation. On north drainage of meadow. Area burned intensely in 2003 (Fraga, RSA FS 2004 surveys) SBNF.	SBD
40	U	1978	ca. 2 mi. SE of Onyx Peak along FR 1N01. On clay soils w/ Saragosa quartzite cobbles. w/ <i>Arenaria ursina</i> , <i>Arabis parishii</i> , <i>Castilleja cinerea</i> , <i>Phlox dolichantha</i> . SBNF.	SBD
41	U	1990	Little Pine Flat, 0.3 mi. NE of Shay Spring, San Bernardino Mountains. w/ <i>Echinocereus engelmannii</i> . Site subject to ORV use and cattle grazing. SBNF.	SBD
*	U	1964	Big Bear City (Gillet, Moulds/UC/Jeps)	SBD
*	U	1976 1981	Flat opening of 15 acres of PJ woodland, fragments of Saragosa quartzite, 7000 ft. T2N, R1E, S23 (Derby/UC/Jeps) (Ciano/UCR) <i>Puts it at the Sawmill PP complex with both pvt and FS land, assuming this is FS since they both worked for FS and we know it's there.</i> SBNF	SBD
*	U	1979	Holcomb Valley, flat below Hitchcock Ranch where 3N12 crosses creek (Thorne, Tilforth, Little/UC/Jeps) SBNF	SBD

*	U	1989	S end of head of W branch of Jacoby Canyon, along rd from Baldwin Lake to Arrastre Flat, on clay-rich reddish soil, flat opening 7370 ft. (Taylor/UC/Jeps) SBNF	SBD
*	U	1960	Erwin Lake Rd, S and E of Big Bear Valley, 6800 ft (Vasek/UCR)	SBD
*	U	1997	E of Holcomb Valley: Arrastre Flat, USFS 3N16, 1.0 road mile W of junction with 3N02. T3N, R1E, S34 SE1/4. (White/UCR) SBNF	SBD
*	U	1985	E end Big Bear Valley around Baldwin Lake, N shore, near BM 6736. T3N R2E, S31 (LaPre/UCR) <i>section 31 puts it</i> SBNF	SBD
*	U	1979	Fawnskin, N side Hwy 18, just E of Fawnskin on clay pavement of Saragosa quartzite T2N, R1W, S13 (Krantz/UCR). <i>Section 13 is pvt.</i>	SBD
*	U	1975 2004	Coldbrook Campground :Junction of Tulip Rd and Mill Cr Rd SW of city of Big Bear Lake, 7000 ft. (Latting/UCR;VinZant/USFS).SBNF	SBD
*	U	1978	Rouse Meadow, On N drainage of the meadow on edge of tree plantation, T2N, R2W,S7 (Krantz/UCR) SBNF <i>Just NE of Lk Arrowhead</i>	SBD
*	U	1991	Big Bear area, E of Sugarloaf and W of Hwy 38, S of Hwy 18, and Baldwin Lake. T2N, R2E, S19. (White/UCR)	SBD

364121 (RSA)	U	1975	Isolated tract of SBNF. Section 23 near Sawmill Canyon, treeless flat, 10 acres, of tightly packed gravel, pebble plain. (Thorne). <i>This is Sawmill PP complex SBNF</i>	SBD
296497 (RSA)	U	1951	S shore of Big Bear Lake, 0.5 mi E of the dam. Elev. 7000 ft (Benson). <i>This puts it in the Ski Bch, Kidd Cove area though elevation there is lower. SBNF</i>	SBD
85804 (RSA)	U	1930	Above I.S. Ranch, Bear Valley, 6850 Ft. on slope above meadow (Ewan)	SBD
333617 (RSA)	U	1980	SBNF, lower Cushenbury Canyon, not far from cement factory on dolomite slopes, on loose talus (Thorne)	SBD
33773 (RSA)	U	1979	Upper Holcomb Valley. S of Holcomb Valley Campground elev. ca. 7350 ft. <i>Pinus jeffreyi</i> forest, branches from mats. (Thorne) <i>FS and pvt land here, unknown ownership.</i>	SBD
287088 (RSA)	U	1976	Holcomb Valley, elev 7400. T3N, R1W, S36. disturbed roadside site in yellow pine forest (Derby) <i>This is Pebble Plain on 3N12 W of Hitchcock Ranch. SBNF</i>	SBD
85800, 451602 (RSA)	U	1924 1982	N end of Baldwin Lake, stony slope 6700 ft elev.(Peirson). Near the jct. of Hwy. 38 & the Holcomb Valley Road, immediately north of Baldwin Lake, El. ca. 6000 ft. (Gustafson) <i>This is N. Baldwin PP area. SBNF</i>	SBD

*	U	2000	Snow Forest Ski Area, on abandoned ski runs. T2N R1E NE1/4 S30. Present on undisturbed pebble plain habitat and establishing on equipment created water bars in pebble plain habitat. (Kopp) SBNF	SBD
85796, 277686(RSA)	U	1930 1978	Arrastre Flat; near 34° 1' N, 117° 5' W elev. 7500 ft. SBNF (Peirson/O'Brien)	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *TNC = The Nature Conservancy*
- *SBD = San Bernardino County*

Threats

On private land, this species is threatened by development (California Natural Diversity Database 2002). On NFS lands, threats to *Ivesia argyrocoma* include habitat loss resulting from forest system roads and trails and their maintenance, dispersed recreation, prospecting, mining, woodcutting, nonnative species encroachment, emergency dozer created fuelbreak construction and erosion control projects and their maintenance. Because this species is restricted to flat and open habitat in areas of the Forest with high road densities and heavy recreational use, the primary threat to this species is unauthorized motorized and mechanized vehicle travel off Forest System roads and trails. Other unauthorized uses threaten habitat with dumping and target shooting. Fuel treatments within Wildland Urban Interface defense and threat zones may also affect habitat as vegetation is reduced. An increase in vegetative openings has the potential to increase ongoing effects from unauthorized off road travel.

Ivesia argyrocoma often occurs in association with the federally threatened pebble plain species, *Arenaria ursina*, *Eriogonum kennedyi* var. *austromontanum*, and *Castilleja cinerea*. Numerous locations where *Ivesia argyrocoma* co-occurs with listed taxon within pebble plain and meadow habitat will realize the long term benefits of road decommissioning, protective barriers, signing, and relocation of recreation special use permits completed in the late 1990's and early 2000's under the Southern California Conservation Strategy. Conservation efforts that include protection and restoration of listed taxon and the remaining pebble plain and meadow habitat and associated physical features within the San Bernardino National Forest will also protect this species in the future.

Conservation and Management Considerations

The primary conservation strategy for *Ivesia argyrocoma* is to implement the Pebble Plain and Meadow Habitat Management Guides, and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

The following is a prioritized list of conservation practices that should be considered for *Ivesia argyrocoma*:

- Implement strategies within the Pebble Plain and Meadow Habitat Management Guides to the greatest extent practicable.
- Survey all new occurrences of *Ivesia argyrocoma* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Ivesia argyrocoma* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Ivesia argyrocoma* on NFS lands using NRIS data collection standards, and incorporate these occurrences into the corporate GIS database.

Evaluation of Current Situation and Threats on National Forest System Lands

Ivesia argyrocoma is a locally-common narrow endemic species known only to occur in the eastern San Bernardino Mountains, primarily on pebble plain habitat. Some pebble plain habitat is protected from identified threats, although most are still vulnerable.

Based on the above analysis, *Ivesia argyrocoma* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	A	A	B	A	C	A

Ivesia argyrocoma is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The viability of this species is tied tightly to protection and management of pebble plains habitat, and to a lesser extent, meadow habitat. Existing protections of these habitats for the benefit of the associated listed threatened and endangered plant species provide considerable baseline protection. With full implementation of the Pebble Plain and Meadow Habitat Management Guides, viability for this species on NFS lands is secure.

Consideration of the Suitable Use restricting motorized and mechanized vehicle travel to designated Forest System roads and trails, along with Standards related rare plant management, recreation use, mining and riparian area management factor into the outcomes. The recommended Wildhorse and Arrastre RNA's, the recommended Sugarloaf wilderness, the Gold Mountain Critical Biological zone (CBZ) and the Coxey CBZ where applied, are critical to the outcomes. Presumed implementation of the Pebble Plain Habitat Management Guide and the Meadow Habitat Management Guide is key to these outcomes under all alternatives. SBNF Place Standard S2 would also provide protection to pebble plain habitat during environmental analysis of proposed projects under Alternatives 2-6.

Under all alternatives, a large amount of occupied habitat is located within the North Baldwin/Holcomb Valley SIA. Under Alternatives 2-6, Standard S33 would provide additional protection to habitat during analysis of proposed projects. Under Alternatives 2, 3, 4, 4a, and 6, a small amount of habitat would be included with the boundaries of the Holcomb Wild and Scenic River corridor that would become eligible for suitability study. Removal of the Snow Forest Ski Area special use permit under Alternatives 2-6 would also protect a large occurrence of this taxon over the long term. Occupied habitat at the Rouse Meadow occurrence would be zoned Back Country in all alternatives.

Under Alternative 1, pebble plain habitat in general, and *Ivesia argyrocoma* in particular, would continue to be at risk from unauthorized vehicle travel off Forest Transportation System roads and trails. Existing areas zoned Back Country Non-Motorized at Little Pine Flat and Sugarloaf Ridge would continue to provide some protection.

Under Alternative 2, the Coxey and Gold Mountain Critical Biological zones, the Arrastre and Wildhorse recommended RNA's, the full extent of the recommended Sugarloaf Wilderness, and Back Country Non-Motorized zoning at Little Pine Flat and lower Sugarloaf would provide substantial protection for this species.

Under Alternative 3, the Coxey, Union, and Gold Mountain Critical Biological zones, the Arrastre and Wildhorse recommended RNA's, the recommended Sugarloaf Wilderness, and the recommended Deep Creek Wilderness (including Little Pine Flat) would provide substantial protection for this species.

Under Alternative 4, the Coxey Critical Biological zone, Back Country Non-Motorized zoning at Little Pine Flat, and the recommended Sugarloaf Wilderness would provide protection for limited portions of this taxon's range, however the important protections associated with RNA designations and the Gold Mountain Critical Biological zone would not occur. The emphasis of this alternative to meet a high level of projected recreation demand would also affect habitat over the long term across its range.

Under Alternative 4a, the Coxey, and Gold Mountain Critical Biological zones, and the Arrastre and Wildhorse recommended RNA's would provide additional protection for this species. Use of Back Country Motorized Use Restricted zoning within portions of habitat would protect habitat over the long term from unauthorized uses associated with vehicle travel as would additional acreage zoned Back Country Non-Motorized in this alternative. The higher emphasis on dispersed area management in this alternative would benefit habitat.

Under Alternative 5, land use zoning would not provide any protection, nor are there any recommended Special Area designations. The emphasis of this alternative on motorized use would likely result in increased degradation related to the transportation system and its use.

Under Alternative 6, Back Country Non-Motorized zoning across the range of the taxon, along with the Arrastre and Wildhorse RNA's and the Union, Gold Mountain and Coxey Critical Biological zones, and the Sugarloaf proposed wilderness would provide substantial protection.

Viability Outcomes for All lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	B	B	C	B

The pebble plain and meadow-margin habitats for *Ivesia argyrocoma* on private lands in Big Bear Valley have been highly reduced and fragmented by residential and commercial development. This is an important but relatively minor portion of this species distribution. The remaining fragments on private land continue to be lost as continued development occurs. This loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF. By maintaining the current distribution of *Ivesia argyrocoma* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Ivesia argyrocoma* to suffer a decline in its overall distribution.

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Hulsea vestita ssp. pygmaea

Ivesia callida

Ivesia callida

Ivesia callida (H.M. Hall) Rydb. (Tahquitz ivesia)

Management Status

Federal: Forest Service Sensitive

California: Rare (July 1982)

Heritage Rank: G1; S1.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Ivesia callida is endemic to the Tahquitz Peak area of the San Jacinto Mountains in Riverside County. The plant had been considered extinct but was rediscovered in 1980 at the historical location on Tahquitz Peak; a second occurrence was found 2 miles (3 km) away (Berg 1983).

Distribution in the Planning Area

This species is known only from two occurrences within the San Jacinto Wilderness of the San Bernardino National Forest. One occurrence is at Tahquitz Peak; the other is at the head of Andreas Creek.

Taxonomy and Natural History

Ivesia callida is a dicotyledonous herbaceous perennial in the rose family (Rosaceae). *Ivesia callida* flowers from July-September (California Native Plant Society 2001). The stems are less than 6 inches (15 cm) long and grow from a short branching caudex in a hanging or matted form, which distinguishes it from other *Ivesia* species that may occur in the San Jacinto Mountains (Erter 1993).

Ivesia callida is a hanging to more or less matted, green plant with a branched caudex. The stems are generally 2-15 cm. Leaves are 1-7 cm with sheathing bases that are more or less hairy. There are about 6 leaflets per side and the lobes are 2-7 mm, oblanceolate to elliptic. There are about two cauline leaves present. The inflorescence is more or less open and has less than 15 flowers with 5-15 mm pedicels that become S-shaped in fruit. Flowers are about 7 mm wide. The hypanthium length is less than ½ of its

width, petals are about 3mm, obovate, white and more or less equal to the sepals. There are 20 stamens per flower, with 4-8 pistils. Fruit are about 1.5 mm, smooth, and pale (Ertter 1993).

Habitat Description

Ivesia callida grows at elevations of around 8,000 feet (2,440 meters) in upper montane coniferous forest habitat on steep rocky sites on weathered granitic rock, often in crevices or cracks along aplite dikes (California Natural Diversity Database 2004; Berg 1982). Aspect does not appear to be a determining factor; one occurrence is on a southwest-facing slope, and the other is on a north-facing slope (Berg 1982).

The surrounding overstory vegetation is comprised of *Pinus lambertiana*, *Pinus jeffreyi*, *Abies concolor*, and *Quercus chrysolepis*. *Ivesia callida* occurs with *Cercocarpus ledifolius*, *Silene parishii*, and *Epilobium canum*.

Rocky sites in upper montane coniferous forest are relatively uncommon within the planning area. However, suitable habitat currently faces a low degree of threats from Forest uses. Steep granite sites are relatively inaccessible, but may be impacted by activities such as rock climbing.

Occurrence Status

Both populations were described in 1980 as "healthy and stable," and thousands of plants were counted in 1987 (California Natural Diversity Database 2004). In 1980, occ. no. 1 appeared healthy and stable, with plants of many age/size classes. No disturbances were evident. The occurrences occupy a total of 25 acres (10 hectares) (Berg 1982). Partial surveys in 1987 and 1994 relocated both populations, determining that they were still extant (California Natural Diversity Database 2004).

The South Ridge Trail is situated within 100 yards of occ. no. 1. No adverse trail-related impacts were observed. In 1980, the Dry Falls Fire occurred within the vicinity of occ. no. 2 and a fire line was constructed along the ridge near the occurrence. The bedrock habitat acted as a natural fire barrier because of the extremely low fuel availability, and the occurrence was not affected. It is unclear whether fire retardant was dropped on this population. A field check in October 1980 revealed no apparent disturbance to the population.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Ivesia callida* (Tahquitz ivesia)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	10,000 in 1 hectare in 1980	1980-1987	South ridge of Tahquitz Peak, San Jacinto Mtns. Type locality. SBNF, San Jacinto Wilderness.	RIV
2	> 10,000 in 1+ hectare in 1980	1980-1994	San Jacinto Mtns. Head of Andreas Creek, 0.5 mi. NE of Pacific Crest Trail. SBNF, San Jacinto Wilderness.	RIV

- *SBNF = San Bernardino National Forest*
- *RIV = Riverside County*

Threats

Occurrences in the San Jacinto Wilderness Area are protected from many land uses by the wilderness designation of this area. No threats have been observed. The two known populations occur in relatively inaccessible rock habitats, but plants grow from crevices in granitic rocks and may be subject to disturbance from rock climbers who use the crevices for hand- and footholds (USDA Forest Service 2002). Any rock climbing impacts from outfitter guides and groups would be analyzed at the project level prior to issuance of a special use permit.

Conservation and Management Considerations

The primary conservation strategy for this species is to improve the knowledge of its distribution, to determine whether rockclimbing is impacting this species, and to protect occurrences as needed. The following is a list of conservation practices that should be considered for *Ivesia callida*:

- Survey all new occurrences of *Ivesia callida* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Survey all popular climbing routes in suitable habitat within the range of this species. Where impacts to this species are observed, implement protective measures as needed.
- Collect a herbarium voucher specimen of *Ivesia callida* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Ivesia callida* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Ivesia callida is extremely rare and narrowly distributed. While some of the recorded occurrences may be vulnerable to identified threats (primarily rockclimbing), these impacts are not expected to be widespread across available habitat. Where impacts are detected, protective measures are recommended. Most of the suitable habitat for this species is inaccessible except through technical climbing, and most is in designated wilderness.

Based on this analysis, *Ivesia callida* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Ivesia callida is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Ivesia callida* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Ivesia callida* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Ivesia argyrocoma

Juglans californica

Juglans californica

Juglans californica S. Watson var. *californica* (Southern California black walnut)

Management Status

Federal: None

State: None

Heritage Rank: G3, S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4, R-E-D Code 1-2-3

General Distribution

Juglans californica var. *californica*, Southern California black walnut, is distributed in coastal southern California from the Transverse Range foothills in Santa Barbara County south to the Peninsular Ranges of San Diego County (California Native Plant Society 2001, Wilken 1993). It is also reported from the Santa Lucia Range, where it may have been introduced (Wilken 1993). Large stands are present in Ventura, Los Angeles, and northern Orange Counties. The easternmost stands occur in southwestern San Bernardino County in Day, Etiwanda, and San Sevaine Canyons at the foot of the San Gabriel Mountains. *Juglans californica* var. *californica* forest community is a much fragmented, declining natural community that is rare in most southern California counties (California Native Plant Society 2001).

Distribution in the Planning Area

Juglans californica var. *californica* occurs on National Forest System lands on all the southern California National Forests. Occurrences on the Los Padres National Forest include the Rincon Creek area, the Ojai area, and the Santa Ynez Mountains north of Santa Barbara. On the Angeles National Forest, the species occurs in Pacoima Canyon in the San Gabriel Mountains. Specimens are recorded from the Santa Rosa Mountains and the foothills of the San Bernardino Mountains, including Cajon Pass and the Lytle Creek area, on the San Bernardino National Forest. On the Cleveland National Forest, southern California black walnut occurs along the Sweetwater River and possibly along the Tenaja Truck Trail (CalFlora 2000, Reiser 1994). The great majority of southern California black walnut woodlands are found in urban interface areas (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Juglans californica var. *californica* is a dicot in the walnut family (Juglandaceae). It is one of two species of walnut native to California (Whittemore and Stone 1997). *Juglans californica* var. *californica* is a small tree, often producing several trunks. It has slightly smaller leaflets and fruits than northern California black walnut (*J. hindsii*), which is a larger tree with a single trunk that does not occur naturally in southern California (Wilken 1993). *Juglans californica* var. *californica* is a deciduous tree that blooms March–May (California Native Plant Society 2001).

Habitat Description

Juglans californica var. *californica* occurs along slopes and in canyons within chaparral, coastal scrub, and cismontane woodlands at elevations of 160–2,950 feet (50–900 meters) (California Native Plant Society 2001). It usually occupies mesic areas (i.e., riparian corridors, floodplains, and north-facing slopes) and prefers soils with a high clay content (Wilken 1993, Stephenson and Calcarone 1999, California Native Plant Society 2001). It can be the dominant tree in the canopy or can occur in mixed stands with other hardwoods, such as coast live oak (*Quercus agrifolia*). At Los Pinetos Spring in the western San Gabriel Mountains, *Juglans californica* var. *californica* grows with bigcone Douglas-fir (*Pseudotsuga macrocarpa*) and canyon live oak (*Q. chrysolepsis*). Some isolated stands occur within chaparral and coastal sage scrub (Stephenson and Calcarone 1999).

Occurrence Status

The California Natural Diversity Database does not maintain records on occurrences of *Juglans californica* var. *californica* in its Rarefind database (2004). An estimated 2,828 acres (1,145 hectares) of southern California black walnut woodlands occur on National Forest System lands in southern California. However, this estimate is based on distribution maps from the 1930s and the current status of these stands are not well known. A small 30-acre (12-hectare) stand of southern California black walnut woodland is located on the Angeles National Forest, and 3,896 acres (1,577 hectares) occur on the Los Padres National Forest. A small amount of black walnut woodland is reported from the San Bernardino National Forest (Stephenson and Calcarone 1999).

Threats

Only a small amount of *Juglans californica* var. *californica* woodland is present on National Forest System lands. In general, development on private lands appears to be the primary threat to this community, although private landowners are being encouraged to retain these woodlands as part of their landscaping (Stephenson and Calcarone 1999). Some *Juglans californica* var. *californica* woodlands appear to have low regeneration. It is unclear whether the problem is caused by livestock grazing, invasion of nonnative annual grasses, seedling predation, or disease; the situation may prove to be a combination of these factors. Intensive livestock grazing in *Juglans californica* var. *californica* woodlands has been shown under certain conditions to lower the survival rates of walnut

seedlings by direct herbivory and by the introduction of nonnative undesirable plants into the understory.

Conversion from a native perennial grass understory to one dominated by nonnative annual grasses is believed to be a primary cause of low regeneration in walnut woodlands, in much the same way that such conversion has affected oak woodlands (Stephenson and Calcarone 1999).

The effects of existing fire regimes on *Juglans californica* var. *californica* are also poorly understood. The species is top-killed by most fires, but resprouts from the root crown and trunk after burning (Stephenson and Calcarone 1999).

Hybridization with nonnative horticultural varieties of walnut may also pose a problem for the maintenance of pure native walnut stands (Reiser 1994, Stephenson and Calcarone 1999). Further monitoring and study are needed to determine how all these factors are affecting walnut woodlands and to develop effective conservation strategies.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Juglans californica* var. *californica*:

- Monitor and map all habitat and species occurrences, and incorporate these occurrences into the NRIS.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on federal lands.

Evaluation of Current Situation and Threats on National Forest System Lands

Juglans californica var. *californica* woodlands are considered a declining plant community due to habitat loss on private lands and low representation on public lands. Quantitative data is available only for the Los Padres National Forest, where estimates of acreage covered by this species were developed in the 1930s (Weislander 1935). A better determination of the current distribution of this community is needed (Stephenson and Calcarone 1999).

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon and peripheral in the Plan Area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Juglans californica* var. *californica* would remain distributed across its current geographic range on National Forest System

lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Juglans californica* var. *californica* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Juncus duranii

Juncus duranii Ewan (Duran's rush)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Juncus duranii is endemic to the San Gabriel, San Bernardino, and San Jacinto mountains. This species occurs in Los Angeles, San Bernardino, and Riverside counties.

Distribution in the Planning Area

In the San Bernardino Mountains, *Juncus duranii* is known from Bluff Lake, Lemon Lily Springs, Dry Lake Meadow, and High Creek (Krantz, et. al. draft 2000). Cal Flora also reports occurrences from Mill Creek and the Coldwater fork of Lytle Creek in the eastern San Gabriel Mountains, Dawson Saddle, Mount San Antonio and Mount Hawkins in the San Gabriel Mountains, and Round Valley in the San Jacinto Mountains. *Juncus duranii* is endemic to the San Gabriel, San Bernardino and San Jacinto Mountains.

Taxonomy and Natural History

Juncus duranii is included in *Juncus mertensianus* in the Flora of North America Vol. 22 (Brooks and Clemants 2000), however, the combination has not yet been accepted by the Jepson Flora Project. *Juncus mertensianus* is widespread throughout the Pacific Northwest, northern Sierra Nevada and Rocky Mountains north through western Canada and southern Alaska (Brooks and Clemants 2000). While *J. mertensianus* is widespread, *Juncus duranii* is equally rare within the Planning Area under either name, and under the name *J. mertensianus*, occurrences in the Province would warrant conservation as morphologically distinct disjunct populations.

Juncus duranii is a monocotyledon in the rush family (Juncaceae). This species flowers between July-August (California Native Plant Society 2001). *Juncus duranii* is a perennial, caespitose 3-20 cm plant with a vertical rhizome. The stems are slender and more or less flat. The leaves are mostly cauline. The sheath appendages are prominent and rounded. The blade is cylindric, generally equal to the stem, with a long tip and complete, but obscure crosswalls. The lowest bract on the inflorescence is greater than the inflorescence, is narrow, not sheathing, and has a rolled tip that is greater than the rest of the bract blade (which is not generally present in fruit). There is generally one cluster. The bractlets are awned. The perianth segments are approximately 3 mm, are more or less equal, linear-lanceolate, stiff, and brown. There are six stamens. The filaments are less than or equal to the anthers. The fruit are more or less equal to the perianth. Seeds are 0.5 mm and narrowly lanceolate (Swab 1993).

Habitat Description

Juncus duranii inhabits wet meadows and streambanks within conifer forest between 5800-9,200 ft. This species generally occurs in the wettest portions of meadows, often along stream channels or depressions, or other areas of saturated soils.

Occurrence Status

Most occurrences are on National Forest System lands, and presumed extant. Two occurrences are in San Jacinto Mountain State Park and presumed to be extant. The Bluff Lake occurrence on protected private land is presumed extant. The Seeley Flat occurrence may have been extirpated by development, field work is needed. The status of the Buckhorn locality is unknown and may be on the LPNF in Ventura rather than LA County, as recorded. No occurrences of this species (within the national forests of southern California) have been recorded recently.

The following table shows the recorded occurrences in/near the area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Juncus duranii* (Duran's rush)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1230624	U	1892	Headwaters of Mill Creek, San Bernardino Mountains. SBNF.	SBD
1364438	U	1917	Coldwater fork of Lytle Creek. SBNF.	SBD

1364437, 1230622	U	1917, 1918	Kelly's Cabin. San Antonio Mountains. Ontario Peak. Cucamonga Wilderness. SBNF/ANF.	SBD/LA
1345635	U	1892	Mill Creek Falls, San Bernardino Mountains. SBNF.	SBD
1293937	U	1933	Buckhorn, San Gabriel Mountains. [near Piru in VEN?] Land owner: U.	LA
1333478	U	1969	1.2 mi. SE of Dawson Saddle; near Lodgepole Picnic area, at headwaters of Dorr Canyon, N slope of Throop Peak, above Angeles Crest Hwy. San Gabriel Mtns. ANF.	LA
1213180	U	1936	Lily Springs, San Gabriel Mtns. Mt. Hawkins. ANF.	LA
1328871	U	1909	Round Valley, San Jacinto Mountains. San Jacinto Mountain State Park.	RIV
1328872	U	1909	Head of Round Valley, San Jacinto Mountains. San Jacinto Mountain State Park.	RIV
*	U	U	Lemon Lily Springs, 7,300'. SBNF	SBD
49909 (RSA)	U	1924	Bluff Lake. Moist sand in meadow. (Johnston) The Wildlands Conservancy	SBD
*	U	U	Dry Lake, 9,200'. San Gorgonio Wilderness, SBNF	SBD

1616 (RSA)	U	1916	High Creek, Upper Mill Ck Watershed. (Crawford) SBNF	SBD
*	U	U	Seeley Flat (Valley of Enchantment). Ownership U.	SBD
600732 (RSA)	U	1954	San Gabriel Mtns: Little Rock Creek, ca. 1 mile downstream from Cooper Creek. (Wheeler)	SBD
228879 (RSA)	U	1971	San Gabriel Mtns.,ANF: near Windy Spring on N Slope of Mt Islip (Thorne)	SBD
639059 (RSA)	U	1968	San Gabriel Mtns: NE slope Mt. San Antonio. Headwaters of west fork of north fork Lytle Creek. T2N R7W NW/4 NW/4 sec. 5. Elev. 8900 ft . (Wheeler)	SBD
330789 (RSA)	U	1981	San Gabriel Mtns,ANF: CA Highway 2 between Dawson Saddle and junction of CA Highway 39, 1.8 miles from Dawson Saddle; elev. ca. 7500 ft. (Sawyer)	LA
70294 (RSA)	U	1921	Prairie Fork of San Gabriel River, San Gabriel Mtns. Alt. 6750 ft. (Peirson)	LA
12662 (RSA)	U	1922	Hidden Lake, San Jacinto Mtns. Frequent on sandy shore Alt: 8000 ft. (Munz)	RIV
48366 (RSA)	U	1924	Dark Canyon, San Jacinto Mtns. Along creek Alt. 6500 ft. (Munz)	RIV

48885 (RSA)	U	1924	Deer Springs; elev. 8100 ft, in crevice by brook (Munz)	RIV
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- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*
- *RIV = Riverside County*
- *VEN = Ventura County*
- *RSA = Rancho Santa Ana*

Threats

Primary threats to *Juncus duranii* on Forest System lands are hydrological impacts from ground-disturbing activities (especially during winter and spring when soils are wet), water diversions, cattle grazing, fire suppression activities, fuels and vegetation treatments, roads and road maintenance, non-native species invasion, development projects, and vehicle use off designated roads.

The main threat to *Juncus duranii* occurrences off Forest System lands is extirpation and habitat loss from residential development and associated water diversion and extraction.

Conservation and Management Considerations

The short-term conservation strategy for *Juncus duranii* is to develop a Habitat Management Guide and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species, irrespective of taxonomic identity:

- Prepare a Habitat Management Guide for vernal wetlands on the SBNF, including mesic swales, seeps and springs. This Guide should specifically address *Juncus duranii* and associated mesic species including *Castilleja lasiorhyncha*, *Calochortus palmeri* var. *palmeri*, *Mimulus exiguous*, *Phacelia mojavensis*, *Phacelia exilis*, and *Navarretia penninsularis* where they occur on the SBNF.
- Identify, describe, and map suitable habitat for *Juncus duranii* on the SBNF and survey these areas during a normal or above-normal rainfall year for species occurrence.
- Survey all new occurrences of *Juncus duranii* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Juncus duranii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.

- Map known and new occurrences of *Juncus duranii* on NFS lands using NRIS data collection standards, and incorporate these occurrences into GIS corporate database.

Evaluation of Current Situation and Threats on National Forest System Lands

Juncus duranii is a rare, narrowly-distributed species, known from the San Gabriel, San Bernardino, and San Jacinto Mountains. None of the occurrences on NFS lands are fully protected from identified threats.

Based on the above analysis, *Juncus duranii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	A	C	A

Juncus duranii is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Juncus duranii* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

The primary ongoing threats to this species on NFS lands are road use and management, associated off-road use near watercourses, and water diversions.

The majority of ongoing and expected impacts to this species occur in Back Country and Developed Area Interface zones. Under Alternatives 1, 2, 3, and 4, this species would be at continued risk from ongoing impacts to its habitat at approximately current levels. Under Alternative 4, impacts associated with higher levels of expected recreational use would be minimized by expected increases in management control and monitoring. Under Alternative 4a increased extent of non-motorized and motorized use restricted zoning and recommended wilderness in the eastern San Gabriels provides an increased level of protection. Under Alternative 5 there would be increased threats as a result in an increase in Back Country zoning across the range of the species, an expected increase in road and trail construction and use, and additional water diversions/extractions. Under Alternative 6 there would be decreased threats as a result of a decrease in Back Country zoning across the range of the species, and no expected increase in road and trail construction.

Preparation of a Habitat Management Guide to address this species would be expected to have a higher priority and happen sooner under Alternatives 2, 3, 4, 4a and 6. The response time and effectiveness of impact identification and management would be expected to be higher under Alternatives 3 and 6.

Consideration of the Suitable Use restricting vehicle travel to designated Forest Transportation System roads and trails, along with Standards for recreation, and riparian conservation areas factor into the outcomes.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	B	B	C	B

The private lands of Big Bear Valley and near Lake Arrowhead and Crestline have been highly reduced and fragmented by residential and commercial development. The remaining fragments continue to be lost as continued development occurs. As development, the demand for water and new diversions/ extractions also increases. The majority of the distribution of this taxon occurs on National Forest System lands on the SBNF. While it is presumed that this species continues to lose habitat to private land development, this loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF.

By maintaining the current distribution of *Juncus duranii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Juncus duranii* to suffer a decline in its overall distribution.

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Juglans californica

Layia heterotricha

Layia heterotricha

Layia heterotricha (DC.) H.& A. (Pale-yellow layia)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G1; S1.1 – very threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Layia heterotricha has been reported from about 58 locations in the inner South Coast Ranges, the east and western edges of the San Joaquin Valley, the Western Transverse Ranges, and Tehachapi Mountains (California Department of Fish and Game 2002, Calflora 2002, Baldwin & Bainbridge 1993). Many of these observations were derived from collections made in the 1930s, '40s, and 50s. In 1988, attempts to locate historical occurrences were largely unsuccessful (Baldwin and Bainbridge 1992) but subsequent efforts have resulted in the documentation of at least 25 extant occurrences in Santa Barbara and Ventura counties. It is known from Fort Hunter Liggett and is documented near the city of San Luis Obispo (Painter 2004).

Distribution in the Planning Area

Within the National Forest System, *Layia heterotricha* is found only within the boundaries of the Los Padres National Forest (LPNF). Here, *Layia heterotricha* is found at about twenty-one locations on the Mount Pinos Ranger District (MPRD) and the Ojai Ranger District (ORD) in the Sierra Madre Mountains, near Pine Mountain, in the Cuyama Badlands, and in the Lockwood Valley area.

On the ORD, *Layia heterotricha* is found near road 6N03 west of Potrero Seco (Los Padres National Forest files 2003), and it is also reported from two sites 3 to 3.6 miles south of the intersection of Highway 33 and the roads to Potrero Seco and Pine Mountain (CalFlora 2003).

On the MPRD, *Layia heterotricha* is reported to occur in eighteen locations. Smith (1998) reports that *Layia heterotricha* is found along the northern foothills of the Sierra Madre Mountains from

Cottonwood Canyon to Santa Barbara Canyon although it is not clear if these locations are on National Forest System (NFS) land or on private land. Along Sierra Madre Ridge, this plant has been found in Pine Corral Potrero, Salisbury Potrero, Santa Barbara Potrero, at a site between Salisbury and Santa Barbara potrerros, and at the southeast end of the range in Bear Canyon (Smith 1998, CalFlora 2002, Los Padres National Forest files 2003). On the east side of Highway 33, *Layia heterotricha* has been found at the following locations: in two places in Quatal Canyon; Burges Canyon, near Oak Creek on Hwy 33, near Little Dry Summit on Lockwood – Ozena Road; and Wagon Road Canyon (California Natural Diversity Database 2004, Los Padres National Forest files 2003). *Layia heterotricha* also occurs along the road to Thorn Meadows about 0.4 miles south of Lockwood Valley Road, and in half a dozen locations in Lockwood Valley on private land (CNDDDB 2004, Merk pers. comm.) and on public land (Los Padres National Forest files 2003).

Taxonomy and Natural History

Layia heterotricha is a dicotyledonous plant in the sunflower family (Asteraceae) and is a member of the subtribe Madiinae (tribe Madieae; Baldwin and others 2002). *Layia heterotricha* is a stout, glandular, banana or apple scented annual, 5-35 inches (13-90 cm) tall. The leaves are 4-5 inches (12 cm) long, often clasping, elliptic to ovate, and entire to minutely serrate. The 7-13 ray flowers are creamy white to pale yellow and 0.2-1 inch (5-24 mm) long. The corollas of the disk flowers are 1/8-1/4 inch (4-7 mm) long and vary in number from 43-91. The anthers are yellow. The fruit is 0.16-0.25 inches (4-6.5 mm) long and the disk pappus consists of 4-20 deciduous bristles. *Layia heterotricha* blooms from March to June and after seed set the plants rapidly senesce.

The number of plants present from year to year fluctuates widely in response to the amount and distribution of winter precipitation. *Layia heterotricha* is probably an obligate outcrosser dependent upon a wide variety of insects, primarily hymenopterans, for dispersal of pollen.

Phylogenetic work by Baldwin (1996, personal communication) indicates that *Layia heterotricha* may be an evolutionary relict that diverged prior to diversification of all other species in *Layia*. Baldwin's data are consistent with strong reproductive barriers between *L. heterotricha* and other members of *Layia* (Clausen 1951; Kyhos and others 1990). Using the strictly phylogenetic, conservation criteria of Mishler (1995) and others, *L. heterotricha* would have a higher conservation priority than any other species of *Layia*.

Habitat Description

Layia heterotricha occurs in grasslands and open areas in oak woodland, pinyon-juniper woodland, and sagebrush scrub below 5,200 feet (1600 meters) elevation (California Natural Diversity Database 2004, Los Padres National Forest files 2003). The species grows on fragile soils variously described as sandy, calcareous, gypseous clay, decomposed shale, ultra-fine friable (dry bog) clay, clay vertisols, or as alkaline clay (Hoover 1970, Twisselmann 1995, Stephenson and Calcarone 1999, California Natural Diversity Database 2004, Lewis 1997). On the Los Padres National Forest, *Layia heterotricha* is most

often associated with calcareous potreros and Lockwood clays. Baldwin (1994) notes that it often occurs on sites with "below-average exotic vegetative cover."

Occurrence Status

Documenting trends in population abundance is complicated by the large natural variance in population numbers that occurs in response to yearly changes in annual rainfall. Wet years tend to favor the expression of *Layia heterotricha* populations and in dry years few if any seeds may germinate and produce flowers. Hoover (1970) reported that *Layia heterotricha* is "frequent on hillsides or sometimes on plains..." Twisselmann (1995) stated that *Layia heterotricha* is "scarce ...[but] often colorfully common in this unusual soil [highly local beds of ultra-fine friable (dry bog) clay." Steeck (1995) found that *Layia heterotricha* in Quatal Canyon could vary from over 200 plants in a population in one year to just five plants the following year. In 2003 there were over a thousand plants at same location (Foster 2003a).

In the Carrizo Plains National Monument, a cluster of seven colonies consisted of over 6,000 plants. On NFS land at Santa Barbara Potrero, *Layia heterotricha* has been repeatedly collected and/or recorded (1957, 1960, 1962, 1965, 1975, 1994, 1995, 2001, 2002) indicating that this occurrence is able to maintain itself for many decades despite the use of this land for cattle grazing.

Surveys conducted in 2003 have resulted in the discovery of six occurrences of *Layia heterotricha* on the Los Padres National Forest and some of these occurrences numbered in the tens of thousands (Foster 2003b, 2003c, 2003d, 2003e, 2003f).

A table shows the number of occurrences recorded in the literature and in the files of the Los Padres National Forest, the number of plants reported to be present, and the general location of these occurrences. This information indicates that *Layia heterotricha* occurrences continue to be widely distributed across the species historic range but it also shows that many occurrences have not been revisited in the last 40-60 years.

Threats

Layia heterotricha was reported to have moderate vulnerability on NFS lands (Stephenson and Calcarone 1999) due to livestock grazing, invasion of nonnative annual plants, and off-highway vehicle trespass. Trail and road maintenance may also affect several occurrences.

California Natural Diversity Database (CNDDDB) Occurrence 3 is located just west of the Cachuma Wilderness and is within the Burges Grazing Allotment. The Burges Allotment is active but the occurrence of *Layia heterotricha* is found at the very uppermost elevation of the allotment in an area that is not used by cattle due to steep terrain and large travel distances to shade and water. An off-highway vehicle trail was proposed to pass through the area occupied by *Layia heterotricha* but this proposal has been withdrawn. Habitat for *Layia heterotricha* is in a stable trend at this location.

CNDDDB Occurrence 5 is thought to be located on a hillside that is located just east of Highway 33 in the Bear Canyon watershed. This occurrence had not been seen since 1934 until rediscovered in 2003. This occurrence is on a hillside that is not susceptible to road maintenance impacts as the slope is set back from the highway. There is no land use occurring here and habitat appears secure. Across the drainage from this location another occurrence of *Layia heterotricha* was discovered along an old road constructed in 1949 or 1950 for the purposes of constructing a gas pipeline. This road has not been used since. The occurrence of *Layia heterotricha* is found on an old road cut. Pre-disturbance information on abundance is not available. The 300-400 plants observed in 2003 appeared to be unaffected by any current land uses and the habitat appeared stable.

CNDDDB Occurrences 21, 25, and 26 and CalFlora ID 1819153 are all found within the Santa Barbara Potreritos Grazing Allotment or on private land that is used for cattle grazing as part of the operation that also grazes the Santa Barbara Potreritos Allotment. Sierra Madre Road passes through Occurrences 25, 26, and 1819153. The effects of cattle grazing at these locations has not been studied or well monitored. It is likely that cattle graze and trample *Layia heterotricha*, as cattle are often present during the time that *Layia heterotricha* is actively growing and producing flowers and seed. Cattle are also actively grazing non-native plants such as *Erodium cicutarium* and *Bromus* spp. In 2003, livestock entered Santa Barbara Potrero after *Layia heterotricha* had largely completed flowering and no herbivory was noted on the drying plants on June 7. Livestock passing through occupied habitat may be dispersing and burying seeds possibly providing some benefit to germination success. In years when cattle enter the potreros prior to June 1, use of the potreros by livestock may damage flowering plants due to their hollow stems being easily broken. Whether the net effect of cattle grazing on *Layia heterotricha* habitat is beneficial or deleterious has not been determined. It appears that the general practice of not turning livestock into the potreros until mid-May or later is sufficient to reduce significant herbivory or physical damage to *Layia heterotricha* from livestock grazing in this allotment.

CNDDDB Occurrence 24 is found within the Potrero Seco Grazing Allotment. This allotment is currently inactive and has been for the last twelve years. In all alternatives the Forest Service is proposing to close this allotment. Livestock grazing would no longer potentially affect this occurrence. The presence of two noxious weeds, *Taenitherum caud-medusae* (medusahead) and *Centaurea solstitialis* (yellow star-thistle), in areas of otherwise suitable habitat has reduced the quality of *Layia heterotricha* habitat in this area and will continue to do so in the absence of an integrated pest management plan. Other plants such as *Descurainia sophia* and *Sisymbrium altissimum* are also important competitors.

CNDDDB Occurrence 29 is found in an area that is not actively managed for recreation or grazing and there does not appear to be any adverse impacts to habitat from the use and maintenance of Highway 33. Based on available information it appears that some of the *Layia heterotricha* habitat in this area is located on private land. On both private and NFS land habitat quality is currently stable.

The two occurrences of *Layia heterotricha* found in Quatal Canyon exist in an area not subject to active management but off-highway vehicle trespass has impacted some *Layia heterotricha* habitat and continues to be a threat at one of three locations where *Layia heterotricha* occurs. Otherwise habitat

here is stable.

The one occurrence of *Layia heterotricha* found in Wagon Road Canyon is located in the Wegis Grazing Allotment. This portion of the allotment has not been used in over five years due to concerns about cattle creating a traffic hazard on the Lockwood-Ozena county road. This area of the allotment has historically been lightly used by livestock due to the lack of developed water sources but cattle have and could in the future use forage in the general area of this occurrence. The moderately steep slopes with deep clay soils and little or no forage tend to preclude any substantial use of *Layia heterotricha* habitat. Use and maintenance of the Lockwood-Ozena road has had no apparent direct effect on *Layia heterotricha* habitat but the road may serve as access for trespass off-highway vehicles. The frequency and magnitude of off-highway vehicle trespass in this area is not currently impacting habitat at this time and habitat quality appears to be stable; however, the threat of OHV trespass remains due to the presence of past impacts on nearby habitats.

Occurrence 1820864 (CalFlora ID) is located on along Grade Valley Road in an area that has been subject to intensive road maintenance. The section of Grade Valley Road where *Layia heterotricha* occurs is subject to failure due to its location atop Lockwood Clay deposits. When saturated these clay deposits are susceptible to sliding. It is unknown if these road failures and road maintenance activities have impacted *Layia heterotricha* but it likely that there has been some lost habitat resulting from road construction and related maintenance activities. Habitat quality at this time is stable but future landslide events could result in further habitat degradation.

Survey work in 2003 found or relocated three occurrences of *Layia heterotricha* in Lockwood Valley. Two of these occurrences are quite large. One is located near the mouth of the North Fork of Lockwood Creek and is near or part of an occurrence discovered on private land in 2002 by Kevin Merk. On NFS land, *Layia heterotricha* occurs over a broad area of valley bottom and this land is not currently allocated to any use other than dispersed recreation. This area was apparently "revegetated" in the 1950s as the 1962 Piru Allotment Management Plan makes reference to this area and it is shown on the allotment map as being fenced off from the allotment in order to protect the project area. It appears that perennial grasses (*Agropyron pubescens*) were sown, perhaps after first burning the sagebrush. There is no record of *Layia heterotricha* at this location so it is difficult to relate this land history to the history of the occurrence but it is clear that currently, *Layia heterotricha* habitat at this location is in a stable or upward trend. A second occurrence is found primarily on private land near two other occurrences also located on private land. These private land occurrences are all found in rangelands that have been grazed since 1879. Historic use has been to begin grazing in late May or June and this pattern of use has probably resulted in adequate protection for *Layia heterotricha* since livestock don't enter *Layia heterotricha* habitat until after the plant has completed all or the majority of its life cycle. On NFS land, the occurrence of *Layia heterotricha* had been severely grazed by trespass livestock (Foster 2003e). The Forest Service has taken action to prevent further trespass. This incident shows that grazing during the spring growing season can have significant effects on a *Layia heterotricha* population.

A third occurrence of *Layia heterotricha* found in Lockwood Valley is found on land that appears to be once disturbed sagebrush scrub. Here, *Layia heterotricha* is found on a roadside drainage ditch berm

and in open scrub on private land. A fourth occurrence of *Layia heterotricha* in Lockwood Valley, discovered in 2003, is found on land located below the settling pond dam for a moderately sized mining operation. The occurrence is found on NFS land but may have once been disturbed by some type of land use related to the mining operation. No evidence of disturbance over the last decade or so was evident.

Survey work in 2003 also resulted in the detection of two other occurrences of *Layia heterotricha*. One is located adjacent to Lockwood Valley – Ozena Road near Little Dry Summit (Foster 2003b). Habitat here is unaffected by land uses or road maintenance. The plants are found in two patches on the steep side slopes of a hill that is not prone to any impact and the habitat appears unaffected by humans. The second occurrence was found adjacent to Highway 33 near Oak Creek (Foster 2003c). Most of the occurrence is found away from the immediate highway and is not affected by land or road use. However, about 100 plants are found in the highway right of way and plants here are susceptible to road maintenance practices as well as from competition from yellow star-thistle.

Off of NFS land it is difficult to assess current threats and the status of *Layia heterotricha* habitat. The Carrizo Plains National Monument provides habitat for at least five occurrences (CNDDDB Occurrences 6 and 7, CalFlora ID 131400 and 1820866, and the occurrences reported from the Caliente Range) and perhaps two other occurrences (CNDDDB Occurrences 8 and 9) are also located within the monument. All of these occurrences are assumed to be secure with habitat in a stable or upward trend. This metapopulation is likely to persist well into the foreseeable future.

Plants found in the Cuyama Valley (CNDDDB Occurrences 19 and 28) need to be relocated to determine their landowner status. Most of this area is managed for livestock but some of this land is used for oil extraction, row crops, and orchards. It is not possible to at this time to determine the status of *Layia heterotricha* habitat in the Cuyama Valley.

The population of *Layia heterotricha* at Tomo-Kahni State Park is reported to be "healthy" and the presence of 500 plants on Bureau of Land Management land at Joaquin Ridge suggests that this occurrence is not currently at risk of extirpation.

More information is needed to determine the status of *Layia heterotricha* occurrences found in Fresno, Kings, Monterey, and San Benito counties.

Conservation and Management Considerations

- Determine status of CNDDDB Occurrence 24 in terms of habitat quality and population size. Determine whether non-native plants are reducing the probability that this occurrence will persist over time.
- Establish monitoring protocol for occurrences of *Layia heterotricha* found within the Santa Barbara Potrereros allotment in order to determine trends in habitat quality and population size.
- Monitor occurrences of *Layia heterotricha* found in Quatal Canyon and Wagon Road Canyon to

determine magnitude of threat posed to habitat quality from off-highway vehicle trespass. If monitoring indicates moderate to high vulnerability for these occurrences convene interdisciplinary team to develop protection measures.

- In an effort to locate additional occurrences of *Layia heterotricha* survey potential habitat found on NFS land in the following areas: Lockwood Valley, the Cuyama Badlands, and the Cuyama Valley.

Evaluation of Current Situation and Risk on National Forest System lands

Based upon the above analysis this species has been assigned the following risk category:

3. Common or widespread in plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Layia heterotricha is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Layia heterotricha* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Layia heterotricha* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Layia jonesii

Layia jonesii Gray (Jone's layia)

Management Status

Federal: Forest Service Watch List; Bureau of Land Management Sensitive

California: None

Heritage Rank: G1 S1.1 – very threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Layia jonesii is endemic to Monterey and San Luis Obispo counties (California Native Plant Society 2001) from Moss Beach in the Monterey Peninsula, through Hames Valley in eastern Monterey County, to Cayucos and San Luis Obispo (California Natural Diversity Database 2004, CalFlora 2002).

Distribution in the Planning Area

Layia jonesii is not known to occur on the Los Padres National Forest but the presence of known populations near the forest boundary (e.g., Camp San Luis Obispo) on the Santa Lucia Ranger District suggests that *Layia jonesii* may be present on National Forest System land in the Cuesta Ridge area (California Natural Diversity Database 2004). *Layia jonesii* may also be present on the Monterey Ranger District, as Matthews (1997) describes that plant's range as "near coast." In addition *Layia jonesii* is documented by several collections from California Polytechnic State University, San Luis Obispo (Painter 2004)

Taxonomy and Natural History

Layia jonesii is a dicot in the aster family (Asteraceae) (Baldwin & Bainbridge 1993).

Layia jonesii is an annual herb that flowers March–May (California Native Plant Society 2001).

Habitat Description

Layia jonesii grows in chaparral and grasslands on clay or serpentine substrates at an elevation of less than 1,200 feet (400 meters) (California Native Plant Society 2001).

Occurrence Status

Hoover (1970) reports that *Layia jonesii* is extirpated from the Cayucos area and the California Native Plant Society (2001) considers this plant to be at risk throughout its range.

Threats

Of the eleven occurrences in the California Natural Diversity Database (2004), only one has a listed threat and that is livestock grazing. Hoover (1970) reported that an occurrence near Cayucos was apparently "exterminated" but does not describe the circumstances. Threats and possible threats at Camp San Luis Obispo (Painter 2004) include cattle, non-native plants, military training activities, feral pigs, too frequent fires, fires in the wrong season, trampling, soil compaction, and dust.

Conservation and Management Considerations

The LPNF needs to acquire current information on distribution and rarity of *Layia jonesii*.

Evaluation of Current Situation and Threats on National Forest System Lands

Layia jonesii is not documented to occur on National Forest System lands but may occur on the Los Padres National Forest based on the reported presence of the species in and around the town of San Luis Obispo.

Based upon the above analysis *Layia jonesii* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Layia jonesii* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Layia jonesii*.

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Layia heterotricha

Lepechinia cardiophylla

Lepechinia cardiophylla

Lepechinia cardiophylla Epling (Heart-leaved pitcher sage)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 3-2-2

General Distribution

Lepechinia cardiophylla, heart-leaved pitcher sage, is found primarily in the Santa Ana Mountains of Orange and Riverside counties (Averett 1993, California Natural Diversity Database 2004). It has also been reported from Iron Mountain in San Diego County and from Baja California, Mexico (California Native Plant Society 2001, California Natural Diversity Database 2004).

Distribution in the Planning Area

There are 23 recorded occurrences of *Lepechinia cardiophylla* on the Cleveland National Forest (CNF). Occurrences are recorded in the Santa Ana Mountains from Sierra Peak, Bald Mountain, on the ridge between Ladd Canyon and East Fork Canyon, along Indian Truck Trail toward Santiago Peak, on Trabuco Peak, along the Divide Road, along Horse Thief Trail, near Pleasants Peak, and on the northwest facing slopes of Mayhew Canyon (California Natural Diversity Database 2004). It has not been recorded from Laguna Mountain, although potential exist within this range (Stephenson and Calcarone 1999). No other *Lepechinia* species are known to occur in the Santa Ana Mountains (Averett 1993).

Taxonomy and Natural History

Lepechinia cardiophylla is a perennial shrub in the mint family (Lamiaceae) with generally short stalked glands. Leaves are cordate to ovate, irregularly serrate, to nearly entire, generally with branched, non-glandular hairs and sessile to short-stalked glands. The corolla is 5-lobed are white with lavender tinge (pink to purple spots) and 2-lipped. The lower lip is longer than the 4-lobed upper lip. Stamens are 4, in

two pairs, included in throat. Style is 2-lobed and also included in the throat. Flower pedicels are 1-3 cm, calyx is spreading at the mouth, tending to drop readily in fruit with short-stalked glands. Sepal lobes are less than tubes. Inflorescence is a raceme with 1 leaf-like, lanceolate bract per flower (Averett 1993). Plants flower from April to June (California Native Plant Society 2001).

Habitat Description and Status

Lepechinia cardiophylla occurs in closed-cone coniferous forests (*Cupressus forbesii*, Tecate cypress), chaparral and cismontane woodlands at elevations of 1,785–4,453 feet (550–1,370 meters) (California Natural Diversity Database 2004; California Native Plant Society 2001). Plants have been found on friant rocky fine sandy loam soils and Exchequer soils and commonly occur with *Cupressus forbesii* and *Ceanothus* sp. (USDA Forest Service 1998). In Baja California shrubs were found in a low-growing, xeric chaparral on volcanic derived soils with chamise (Reiser 1994). The species may be a fire-follower; burned areas on the slopes of Sierra Peak contained a significantly higher number of *Lepechinia cardiophylla* plants than unburned areas (Stephenson and Calcarone 1999).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 15 occurrences of *Lepechinia cardiophylla* (California Natural Diversity Database 2004). Three occurrences are on private lands (or unknown ownerships). The remaining CNDDDB occurrences are on the Cleveland National Forest. Four additional occurrences are documented for *Lepechinia cardiophylla* in the Cleveland National Forest occurrence records.

OCCURRENCE DATA of *Lepechinia cardiophylla* (Heart-leaved pitcher sage) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
6	2-1	U	1982	Indian Truck Trail / CNF	RIV
*	2-2	U	1982	Mayhew Cyn / CNF	RIV
13	2-3	50	1987	Pleasants Peak / CNF	RIV
12	2-4				
11	2-5	25	1990	Pleasants Peak / CNF	OR

5	2-6	U	1931	Santa Ana Mountains / CNF	RIV
*	2-7	U	1982	Indian Truck Trail / CNF	RIV
10	2-8	U	1970	Horsethief Trail / CNF	OR/RIV
9	2-9	U	1982	Beeks Place / private	OR
1	2-10	U	1982	Coal Cyn/ CNF/ DFG	OR
2	2-11	U	1992	Sierra Peak / CNF	RIV/ OR
3	2-12	150-	1992	Sierra Peak / CNF	RIV
4	2-13	1-5	1983	Ladd Cyn / CNF	RIV/OR
7	2-14	1000	1983	Trabuco Peak / CNF	RIV/OR
*	2-16	U	1986	Silverado Cyn / CNF	RIV
*	2-17	U	1986	Silverado Cyn / CNF	RIV
12	2-18	71	1990	Pleasants Peak / CNF	OR
2	2-19	100	1992	Sierra Peak / CNF	OR
2	2-20				
2	2-21				
3	2-22				
14	2-23				

- U = Unknown.
- * = an occurrence number has not been assigned.

- CNF = Cleveland National Forest
- DFG = Department of Fish and Game
- OR = Orange County
- RIV = Riverside County

Threats

A few records of *Lepechinia cardiophylla* on the Cleveland National Forest Lands list show "disturbance by transmission line installation and fire break maintenance" as possible threats (California Natural Diversity Database 2004). In addition, several occurrences are located near roads and are subject to road maintenance activities. However, most populations on the Cleveland National Forest are well protected (USDA Forest Service 1998). Populations on private lands are under threat of development (California Native Plant Society 2001).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Lepechinia cardiophylla*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Allow wildfires to burn through occurrences. Minimize earth-movement during fire suppression activities at known locations. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. Use ridgelines or base of mountains for fuel break construction. The use of hand line for fuel break construction is preferred.
- Where plants occur adjacent to roads, avoid road maintenance activities during flowering period.

Evaluation of Current Situation and Threats on National Forest System Lands

Lepechinia cardiophylla occurs in a number of locations on the Cleveland National Forest in the Santa Ana Mountains. Some occurrences are adjacent to roads, transmission lines, and fuel breaks, where maintenance activities could affect plants or the seed bank. However, the species is a potential fire-follower, so it may respond favorably to mild soil disturbance in these areas. Other occurrences are apparently not negatively affected by Forest Service activities. In general Forest Service-authorized activities do appear to pose a substantial threat to this species.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Lepechinia cardiophylla is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Lepechinia cardiophylla* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Lepechinia cardiophylla* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Layia jonesii

Lepechinia fragrans

Lepechinia fragrans

Lepechinia fragrans (E. Greene) Epling (Fragrant pitcher sage)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-3

General Distribution

Lepechinia fragrans occurs in San Bernardino, Los Angeles, Ventura and Santa Barbara counties. The recorded occurrences are found in the San Gabriel and Santa Monica Mountains, and the Channel Islands (CalFlora 2002; USDA Forest Service 2002).

Distribution in the Planning Area

There are about 12 occurrences of *Lepechinia fragrans* within or near the planning area, all on or near the Angeles and San Bernardino National Forests. Occurrences range from Red Mountain (northeast of San Francisquito Canyon) east to Cucamonga Canyon.

Taxonomy and Natural History

Lepechinia fragrans is a perennial shrub in the mint family (Lamiaceae). The plant generally has long, branched, nonglandular hairs, sometimes with sessile or short-stalked glands (or both). Leaves are deltate-lanceolate to ovate-lanceolate, and serrate to entire. The pedicel is generally 1-4 cm long, and the calyx is inflated at the base and generally persistent into fruiting. Calyx lobes are generally more than (rarely less than) the tube. The fruit is glabrous (Averett 1993). Flowering typically occurs between March and October (USDA Forest Service 2002; California Native Plant Society 2001).

Habitat Description

Occurrences of *Lepechinia fragrans* are found in canyon chaparral between 20 meters and 1,310 meters (California Native Plant Society 2001). Associated species include *Adenostoma fasciculatum*, *Arctostaphylos* sp., *Ceanothus* sp., and *Cercocarpus betuloides* (Holland 1986). Occurrences on Santa Rosa, Santa Cruz, and Santa Catalina islands occur on dry slopes in coastal sage scrub (Catalina Island Conservancy 2002). Species associated with these occurrences include *Artemisia californica*, *Eriogonum fasciculatum*, and *Salvia apiana* (Holland 1986).

Potential habitat for *Lepechinia fragrans* is widely scattered at low elevations (below 5,000 feet) the San Gabriel Mountains (SBNF and ANF), the portion of the ANF north of Castaic and Pyramid lakes, and possibly the coastal portions of the southern LPNF in Ventura and Santa Barbara counties. Suitable habitat is threatened by alteration of the natural fire regime, habitat alteration through type conversion (USDA Forest Service 2002), and fuels and vegetation treatments of the WUI.

Occurrence Status

Most records of this species are within Channel Islands National Park on Santa Rosa and Santa Cruz islands. The presence of these occurrences within the National Park offers protection from threats affecting occurrences on private land and National Forest System land. The three occurrences from Santa Catalina Island are on private land, but the Catalina Island Conservancy manages most of the island for conservation purposes (2001-2002). Occurrences in the Santa Monica Mountains include localities on State Park (Magu) and National Park Service lands. The occurrences on ANF lands may be threatened by impacts from recreational use, roads and trails, alteration of the natural fire regime, and habitat alteration for WUI fuels treatments (USDA Forest Service 2002).

Information on trends in abundance and distribution for *Lepechinia fragrans* occurrences is unknown. Although the species is presumed extant at the recorded localities, several of these records are historic. More information is needed on current distribution and abundance before species trends and current status can be determined.

The following shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Lepechinia fragrans* (fragrant pitcher sage) within and near the Planning Area:

Occurrence ID	No. of Plants	Year Reported	Location/Land Owner	County
Calflora: 1818167, 1818168	U	1883, 1929	Switzer's Camp, near stream. San Gabriel Mountains. ANF	LA

Calflora: 1818169	U	1927	Switzerland Trail, San Gabriel Mountains. ANF	LA
RSA597303 UCR100483 (Swinney)	U	1994	Cucamonga Motorway just west of Cucamonga Cn, 3380'. Based on elevation, private inholding within SBNF boundary. This may be an extension of Johnson's 1918 collection on (UC884243).	SBD
RSA640315 (Wheeler)	U	1931	Wolfskill Canyon. ANF, San Dimas Experimental Forest.	LA
RSA656927 (Soza)	U	2000	Mount Wilson [Toll] Road, above Henninger Flats, 3000'. ANF. Occurrence may include Davidson's 1893 collection (UC25895) and/or Peirson's 1918 collection (JEPS63248).	LA
RSA659917 (Mistretta)	U	1991	Red Mountain. ANF.	LA
RSA659837 (Mistretta)	U	1991	Forest Road 2N66 west of jct. 2N65, overlooking Fern Canyon to the north. ANF	LA
UC140283 (Baker)	U	1904	Hills near Claremont. Ownership U.	LA?
UC884243 (Johnston)	U	1918	Cucamonga Canyon, 3000'. SBNF	SBD
UC1124491 (Horton)	U	1935	Tanbark Flats 2700'. ANF, San Dimas Experimental Forest.	LA
UCR12251 (Whistler)	U	1966	Highway 2, en route to Mt Wilson. 1067 m (3500'). ANF	LA

UCR93874 (Swinney)	U	1996	Frankish Peak, top. On ANF/ SBNF boundary.	SBD
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- U = Unknown
- * = an occurrence number has not been assigned
- PVT = Private land
- ANF = Angeles National Forest
- SBNF = San Bernardino National Forest
- LA = Los Angeles County
- SBD = San Bernardino County

Threats

The primary threats to occurrences of *Lepechinia fragrans* on National Forest System lands are alteration of natural fire regime, habitat loss and degradation from fuels and vegetation treatments, and road and trail use and maintenance. Private land occurrences may be threatened by development.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Lepechinia fragrans*:

- Search for historic localities, perform focused surveys of habitat in proposed WUI treatment areas, and record all new occurrences of *Lepechinia fragrans* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Lepechinia fragrans* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Lepechinia fragrans* on NFS lands using NRIS data collection standards, and incorporate these occurrences into the corporate GIS database.

Evaluation of Current Situation and Threats on National Forest System Lands

Lepechinia fragrans is endemic to coastal southern California, known mostly from the California Channel Islands, but with widely scattered occurrences in the Santa Monica, Liebre, and San Gabriel Mountains. None of the occurrences on National Forest System land are fully protected from identified threats. Based on the above analysis, *Lepechinia fragrans* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	B	C	B	C	B

Lepechinia fragrans is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Lepichinia fragrans* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Threats to this species on the National Forest System Lands are largely unknown, but include fuels and vegetation treatments of the WUI, OHV use, road maintenance, power line right-of-way maintenance. Of these threats, only OHV use and road maintenance substantially vary by alternative. The viability of the Wolfskill and Tanbark occurrences do not vary by alternative as they are within an existing Experimental Forest. Alternatives 3, 4a, and 6 are zoned with a tendency of less motorized use in the areas near the remaining recorded occurrences. Alternative 5 is zoned to increase motorized use in these areas.

Consideration of the Suitable Use restricting vehicle travel to designated Forest Transportation System roads and trails, along with the Standards for road and trail management factor into these outcomes.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	B	B

Most of the recorded occurrences of *Lepechinia fragrans* are protected on private, State Park, and National Park System land, and the widely scattered occurrences across the Liebre and San Gabriel Mountains are almost all on National Forest System land. Forest Service management has an important but relatively minor role in maintaining viability of this species' core habitat, but is essential to maintaining the distribution across its range. By maintaining the current distribution of *Lepechinia fragrans* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Lepechinia fragrans* to suffer a decline in its overall distribution.

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Lepechinia cardiophylla

Lepechinia ganderi

Lepechinia ganderi

Lepechinia ganderi Epling (Gander's pitcher sage)

Management Status

Federal: None

California: None

Heritage Rank: G2, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1- 2

General Distribution

Lepechinia ganderi, Gander's pitcher sage occurs in the Peninsular Ranges of San Diego County and in Baja California, Mexico. Occurrences are reported in the San Ysidro Mountains, Jamul Mountains, and San Miguel Mountains (California Natural Diversity Database 2004).

Distribution in the Planning Area

Lepechinia ganderi has not been found on National Forest System lands. All of the known occurrences are located west of the Cleveland National Forest.

Taxonomy and Natural History

Lepechinia ganderi is a perennial shrub with generally short, branched, non-glandular hairs and short-stalked to sessile glands. Leaves are lanceolate, serrate to entire. The flower pedicel is 1-2 cm. The calyx is spreading and tends to drop readily in fruit. The calyx lobes are more or less equal to or greater than the tube. The corolla is 5-lobed and white with lavender tinge (pink to purple spots) and 2-lipped. The lower lip is longer than the 4-lobed upper lip. Stamens are 4, in two pairs, and included in the throat. The style is 2-lobed and also included in the throat (Averett 1993). Plants flower from June to July (California Native Plant Society 2001).

Habitat Description and Status

Lepechinia ganderi grows in various foothill habitats at elevations of less than 4,300 feet (1,219 meters), including Tecate cypress forest, chaparral, coastal sage scrub, and annual grassland on gabbro or metavolcanic substrates (California Native Plant Society 2001; California Natural Diversity Database 2004).

Occurrence Status

Thirteen occurrences are reported in the San Ysidro Mountains, Jamul Mountains, and San Miguel Mountains (California Natural Diversity Database 2004,) with some population having greater than 2000 plants to dominance among the sites. There are no occurrences on National Forest System lands.

Threats

Lepechinia ganderi is threatened by development at the Jamul Mountains location (Reiser 1994). This species has been recommended for state listing as endangered (Reiser 1994). Given the very specific habitat associations of *Lepechinia ganderi* (metavolcanic soils, coastal mountains of southwestern San Diego), it is highly unlikely that this species would be found on the Cleveland National Forest (Winter pers. comm.), and its conservation must depend on measures taken elsewhere.

Conservation and Management Considerations

Because *Lepechinia ganderi* is not known to occur on National Forest System lands and is unlikely to ever be found there, no conservation measures are recommended.

Evaluation of Current Situation and Threats on National Forest System Lands

There are no known occurrences of *Lepechinia ganderi* on National Forest System lands and, given the species' distribution and habitat requirements, populations are unlikely to be discovered. No effects of Forest Service activities on occurrences outside of National Forest System lands have been identified.

Based upon the above analysis this species has been assigned the following threat category:

1. Not found in the Plan area.

Viability Outcomes

No populations of *Lepechinia ganderi* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Lepechinia ganderi*.

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Lepechinia fragrans

Lepidium flavum var. felipense

Lepidium flavum var. felipense

Lepidium flavum Torr. var. *felipense* C. L. Hitchc. (Borrego Valley pepper-grass)

Management Status

Federal: None

California: None

Heritage Rank: G5T2, S1.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B R-E-D Code 3-2-3

General Distribution

Lepidium flavum var. *felipense* is endemic to Borrego Valley, including Anza-Borrego Desert State Park, in San Diego County (California Natural Diversity Database 2004). One recent herbarium specimen from the south edge of a playa in Little Blair Valley is recorded. Old reports are also from Borrego Valley and San Felipe Valley, more recently population occurrences are documented for a canyon west of Borrego Springs and Yaqui Wells (California Natural Diversity Database 2004).

Distribution in the Planning Area

Lepidium flavum var. *felipense* is not known to occur on National Forest System lands (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Lepidium flavum var. *felipense* is an annual herb in the mustard family (Brassicaceae) that is 1-4 dm tall, with prostrate to ascending stems branched from the base (Rollins 1993). Plants flower from March-May (California Native Plant Society 2001). The basal rosette is comprised of 2-5 cm, oblong-lanceolate to spoon-shaped leaved with irregular to pinnately lobed margins. The cauline leaves are often toothed or entire toward tip. Flowers are small with spreading or erect sepals, yellow linear to obovate 2-3 mm petals, and 6 stamens. The fruit is ovate to round with or without a wing, 3-4.5 mm long, 3-3.5 mm wide. The style is less than the size of the fruit and the pedicel is cylindrical to flat (Rollins 1993).

Habitat Description

Lepidium flavum var. *felipense* grows in pinyon-juniper woodland, Sonoran desert scrub, and creosote-brush scrub at elevations of 1,400–2,750 feet (455–840 meters) (California Native Plant Society 2001; Rollins 1993). The preferred habitat of this small annual within these community types is open, sandy flats, often in a somewhat alkaline microhabitat (Reiser 1994).

Occurrence Status

There are fewer than 10 occurrences of *Lepidium flavum* var. *felipense* known (California Native Plant Society 2001). Apparently, numbers for this small annual vary considerably from year to year based on winter and early spring rainfall. *Lepidium flavum* var. *felipense* is not known to occur on National Forest System lands. The known occurrences are east of the Cleveland National Forest, and there is low probability that the plant occurs on National Forest System lands (Stephenson and Calcarone 1999). Seventy-five percent of CNDDDB occurrences were recorded for Anza-Borrego State Park and twenty-five percent are located on property of unknown ownership (California Natural Diversity Database 2004).

Threats

The limited San Diego County populations of *Lepidium flavum* var. *felipense* are likely stable but potentially impacted by camping and other desert recreational activities in Little Blair Valley (Anza-Borrego State Park), which is sometimes a staging area for group activities (Reiser 1994).

Conservation and Management Considerations

Conservation of this species will depend on efforts outside of Forest Service actions. Because *Lepidium flavum* var. *felipense* is not known to occur on National Forest System lands and is unlikely to ever be found there, no conservation measures are recommended within the Cleveland National Forest.

Evaluation of Current Situation and Threats on National Forest System Lands

Lepidium flavum var. *felipense* has never been documented on National Forest System lands. Given the preference of this plant for sandy soil and its occurrence below elevations of 2,800 feet (Beauchamp 1986, California Native Plant Society 2001), potential habitat for this taxon is unlikely to occur on the Cleveland National Forest. No direct or indirect threats to this taxon from Forest Service activities have been identified.

Based upon the above analysis this species has been assigned the following threat category:

1. Not found in the Plan area.

Viability Outcomes

No populations of *Lepidium flavum* var. *felipense* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Lepidium flavum* var. *felipense*.

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Lepechinia ganderi

**Lepidium virginicum var.
robinsonii**

Lepidium virginicum var. robinsonii

Lepidium virginicum L. var. *robinsonii* (Thell.) Hitchc. (Robinson's pepper-grass)

Management Status

Federal: None

California: None

Heritage Rank: G5T2, SH (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-2

General Distribution

Lepidium virginicum var. *robinsonii*, Robinson's pepper-grass, occurs from southwestern California to Baja California, Mexico (Rollins 1993). Although few occurrences of *Lepidium virginicum* var. *robinsonii* are reported in the California Natural Diversity Database (CNDDDB) (2004), this plant appears to be overlooked and may be much more common (Reiser 1994). The distribution of this taxon includes populations in San Diego County, Riverside County, Orange County, Los Angeles County, San Bernardino County, Santa Barbara County, Santa Cruz Island, and Baja California, Mexico (Reiser 1994).

Distribution in the Planning Area

Within the National Forest System lands, *Lepidium virginicum* var. *robinsonii* locations are documented for the Angeles National Forest and are reported or potentially occur on the Cleveland and San Bernardino National Forests. Stephenson and Calcarone (1999) report presence of this taxon on the Cleveland National Forest however a check on this with the Forest biologist (Winter pers. comm.) in 2005 indicated that no occurrences are known on the CNF.

Taxonomy and Natural History

Lepidium virginicum var. *robinsonii* is an annual herb in the mustard family (Brassicaceae) that blooms January–July (California Native Plant Society 2001). There are four varieties of *Lepidium virginicum* in California. *Lepidium virginicum* var. *robinsonii* is distinguished from the other varieties by several

characters, including flat pedicels, hairy upper stems and inflorescences, and divided or lobed cauline leaves with narrow segments 1-2 mm wide. This variety is described as erect, 3 – 6 feet, and stems branching above. White petals are 1-2 mm and obovate, sepals 1 mm with 0 or few hairs on lower surface, and 2(4) stamens. Fruits are 2.5-4 mm round and glabrous, having a shallow notch that is generally larger than the style and a pedicel equal or larger than fruit (Rollins 1993).

Habitat Description

Lepidium virginicum var. *robinsonii* grows in chaparral and coastal sage scrub below elevations of 1,640 feet (500 meters) (California Native Plant Society 2001). This annual herb grows in openings in chaparral and sage scrub; generally well away from the coast in southern California in the foothill elevations. Typical sites where this species is observed are relatively dry, exposed locales, rather than beneath a shrub canopy or along creeks (Reiser 1994).

Occurrence Status

California Natural Diversity Database documented occurrences for *Lepidium virginicum* var. *robinsonii* are not within National Forest System lands; however, two occurrences are in close proximity to Forest boundaries (California Natural Diversity Database 2004). One CNDDDB record is for a population 2.8 miles northeast of Mentone on or adjacent to the San Bernardino National Forest; the other population is located between Santa Anita Canyon and Sierra Madre on or adjacent to the Angeles National Forest (California Natural Diversity Database 2004). Angeles National Forest occurrence records document 2 localities within the Angeles National Forest boundaries at Graveyard Canyon and Tanbark Flats. Combining records for Angeles National Forest and CNDDDB, 14 populations of *Lepidium virginicum* var. *robinsonii* are known in southern California. Two of these localities are on the Channel Islands and on land owned by The Nature Conservancy; eight are on private land with high likelihood for extirpation; two occurrences are documented for U.S. Navy property on San Clemente Island and in Point Loma; and two known occurrences are on the Angeles National Forest (California Natural Diversity Database 2004). Potential is high for occurrence on lands of the San Bernardino and Cleveland National Forests, although this species is not currently documented to occur on either Forest.

Threats

The few known populations of *Lepidium virginicum* var. *robinsonii* are likely stable, but may they be affected by urban expansion, invasive species, natural patchy population trends, and recreational pressures.

Conservation and Management Considerations

Conservation of this species will depend primarily on efforts outside of Forest Service actions. The following is a list of conservation practices that should be considered for *Lepidium virginicum* var. *robinsonii*:

- Document and map all occurrences when encountered on National Forest System lands and forward occurrence records to the California Natural Diversity Database.

Evaluation of Current Situation and Risk on National Forest System Lands

Population trends of this species and its vulnerability on National Forest System lands are unknown (Stephenson and Calcarone 1999). *Lepidium virginicum* var. *robinsonii* appears to be widespread in southwestern California, though not well documented. Few occurrences are on National Forest System lands, as its primary distribution is at lower elevations. No threats to this taxon have been identified from Forest Service activities at this time.

Based upon the above analysis this species has been assigned the following threat category:

3. Uncommon but widespread in Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Lepidium virginicum* var. *robinsonii*. Variations in land use designations would not alter this current situation, and the various emphases of the alternatives would not result in a substantial change in conditions for *Lepidium virginicum* var. *robinsonii*. *Lepidium virginicum* var. *robinsonii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Lands within Range of Taxon

Lepidium virginicum var. *robinsonii* is considered to have moderate vulnerability across its range. It is reportedly distributed in several highly restricted occurrences and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). The CNPS (2001) assessment may merit reexamination should the species prove to be more common than previously believed (Reiser 1994). By maintaining the current distribution of *Lepidium virginicum* var. *robinsonii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Lepidium virginicum* var. *robinsonii* to suffer a decline in its overall distribution.

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Lepidium flavum var. felipense

**Leptosiphon floribundus ssp.
hallii**

Leptosiphon floribundus ssp. hallii

Leptosiphon floribundus (A. Gray) J.M. Porter & L.A. Johnson subsp. *hallii* (Jeps.) J.M. Porter & L.A. Johnson (Santa Rosa Mountains leptosiphon)

Management Status

Federal: Forest Service Sensitive

California: G4T1; S1.3 (California Natural Diversity Database)

California Native Plant Society - List 1B; R-E-D Code 3-1-3 (California Native Plant Society 2001).

General Distribution

Leptosiphon floribundus ssp. *hallii* is a highly-restricted taxon that occurs in the Santa Rosa Mountains in Riverside and San Diego counties. Of the five known occurrences (California Natural Diversity Database 2004), two are found in the Santa Rosa Wilderness, one is located in Anza-Borrego State Park, one occurrence is in the southwestern Santa Rosa Mountains, possibly on BLM land, and the fifth is in Martinez Canyon.

Distribution in the Province

Only one of the five known occurrences of *Leptosiphon floribundus* ssp. *hallii* is on National Forest System lands. CNDDDB occurrence #4 is located in the Santa Rosa Wilderness Area on the San Bernardino National Forest (SBNF).

Natural History

Leptosiphon floribundus ssp. *hallii* is a dicotyledonous herb in the phlox family (Polemoniaceae).

This hairy or glabrous perennial has entire leaves and inflorescences that occur in bracted clusters, with pedicels 0-15 mm long. Flowers have a calyx that is 7-9 mm long with an obsolete membrane. The funnel-shaped corolla tube is white with a yellow throat, 9 mm long, and each corolla lobe is white and 5-9 mm long. Stamens are included in the corolla or are slightly exerted (R. Patterson in Hickman, ed. 1993). The species typically flowers between May and July (Munz 1974).

Habitat Description

Occurrences of *Leptosiphon floribundus* ssp. *hallii* are found in desert canyons occupied by Sonoran desert scrub between 3,300 ft. and 6,500 ft. elevation (Patterson 1993). The one occurrence on SBNF land in the Santa Rosa Wilderness occurs in open areas along a wash within pinyon-juniper woodland habitat. Sonoran desert scrub is primarily restricted to the southern and eastern portion of the San Jacinto Ranger District. Pinyon-juniper woodland is distributed on the SBNF on desert slopes in the San Bernardino, San Jacinto, and Santa Rosa mountain ranges (Holland 1986). Both habitat types are considered to be stable, although dispersed recreation and other forest uses may affect some areas of habitat throughout the range of *Leptosiphon floribundus* ssp. *hallii*.

Occurrence Status

The single occurrence of *Leptosiphon floribundus* ssp. *hallii* that occurs on Forest land (occ. no. 4) is located in the Pinyon Flat area of the Santa Rosa Mountains (in the Santa Rosa Wilderness), along Horsethief Creek at the Dolomite Mine Trail Crossing. Although no population information was recorded, the taxon was noted as “common in open areas along the wash” (California Natural Diversity Database 2004). The occurrence was last visited in 1988 and is presumed extant. The other three occurrence groups are in Rattlesnake Canyon northeast of Borrego Springs in Anza Borrego State Park (occ. no. 1), Rockhouse Canyon in the Santa Rosa Mountains (owner is unknown) (occ. no. 2), and Alder Canyon in the portion of the Santa Rosa Wilderness managed by BLM. The status of these occurrences outside Forest System lands is unknown.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Leptosiphon floribundus* ssp. *hallii* (Santa Rosa Mountains leptosiphon)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1955	First Canyon East of Clark Dry Lake, 9 mi. northeast of Borrego Springs; Mapped in Rattlesnake Canyon, T9s, R7E, section 36. 3000 feet elevation. Santa Rosa Mountains/DPR-Anza Borrego State Park	SD

2	U	1921	Rockhouse Canyon, Santa Rosa Mountains. T9S, R6E, Section 5. Exact location and elevation in canyon is not known. Mapped at CNDDDB to include entire canyon. U	RIV, SD
3	U	1941	Alder Canyon West (East?) of Coyote Canyon. T8S, R5E, section 14. 4200 feet elevation. Site information is unclear. BLM Santa Rosa Wilderness	SD
4	U	1988	Pinyon Flat area, along Horsethief Creek at Dolomite Mine Trail Crossing. 3600 feet. Mapped along creek at Cactus Spring Trail within the SE ¼ of Section 12. Common along open areas along wash. SBNF Santa Rosa Wilderness (Sanders/UCR)	RIV
5	U	1902	Martinez Canyon, other named canyons=Thermal. (Davidson)	RIV
*	U	1902	Coyote Canyon, W border of Colorado Desert, 600 ft. SW Santa Rosa Mountains (Hall/UC/Jeps)	RIV

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *CDFG = California Department of Fish and Game*
- *SBD = San Bernardino County*
- *RIV = Riverside County*

Threats

The location of occurrence no. 4 on SBNF land in the Santa Rosa Wilderness provides some degree of protection to the taxon. Threats to *Leptosiphon floribundus* ssp. *hallii* occurrences and habitat may include impacts from dispersed non-motorized recreation and Forest trail use and maintenance.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Leptosiphon floribundus* ssp. *hallii*:

- Due to the paucity of reported sites in the region, all populations should be relocated and protected. Surveys should also be conducted at the same time for *Matelea parviflora*, and *Marina orcuttii* var. *orcuttii*, other rare species known from the same vicinity along the Cactus Springs Trail in the Santa Rosa Wilderness. Record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Leptosiphon floribundus* ssp. *hallii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Leptosiphon floribundus* ssp. *hallii* in the Province using SBNF data collection standards, and incorporate these occurrences into the corporate GIS database.
- Coordinate with BLM and Anza Borrego State Park regarding any new information that would be useful in the management of this species.

Evaluation of Current Situation and Threats on National Forest System Lands

Leptosiphon floribundus ssp. *hallii* is only known from several occurrences within the Santa Rosa Mountains in southern California. The occurrence within the San Bernardino National Forest is present along a trail in the existing Santa Rosa Wilderness, which is also within the newly designated San Jacinto National Monument boundary. The effects from trail use and maintenance are unknown however presence within the Wilderness and National Monument provide a high level of protection against major land disturbing actions. The forest location was recorded 17 years ago and the next recent reporting was 50 years ago. Exact threats to this species remain known. Based on what is known about this species distribution and habitat associations, and considering the threat inherent in poor knowledge, *Leptosiphon floribundus* ssp. *hallii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	A	B	A

Leptosiphon floribundus ssp. *hallii* is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

For the known locations of *Leptosiphon floribundus* ssp. *hallii*, the land use zoning and Special Area designations in this location would remain the same and would not change by alternative. The range of this species appears to be from the Santa Rosa Mountains just south of Sugarloaf Mt. in the north, south through BLM lands to the Anza Borrego State Park area in the south. Based on this range, there is high potential for additional habitat to occur on SNBF lands. The viability outcomes include this potential. Potential habitat to the southwest would be zoned Back Country in Alternatives 1, 2, 4, 4a and 5. In Alternative 3, the Cactus Springs A and B Wilderness would be recommended. In alternative 4a, the Cactus Springs A wilderness would be recommended. In Alternative 6, these lands would become zoned as Back Country Non-Motorized. The emphasis on protecting and enhancing biodiversity under Alternatives 3 and 6 could improve the status of this species by relocating the occurrences, defining threats and protecting occurrences and habitat as necessary.

Viability Outcomes For All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	A	B	A

The other locations of this plant occur within the BLM wilderness and the Anza Borrego State Park. The SBNF occurs within the Santa Rosa Wilderness and the San Jacinto National Monument. Effects to this species across its range are expected to be minimized, due to the level of land management practiced where plants occur. By maintaining the current distribution of *Leptosiphon floribundus* ssp. *hallii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Leptosiphon floribundus* ssp. *hallii* to suffer a decline in its overall distribution.

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**Lepidium virginicum var.
robinsonii**

**Lessingia glandulifera var.
tomentosa**

Lessingia glandulifera var. tomentosa

Lessingia glandulifera Gray var. *tomentosa* (Greene) Ferris (Warner Springs lessingia)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4T2, S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-1

General Distribution

Lessingia glandulifera var. *tomentosa*, Warner Springs lessingia, is known from a few occurrences in San Diego County and Baja California, Mexico (California Natural Diversity Database 2004, Reiser 1994).

Distribution in the Planning Area

No occurrences of *Lessingia glandulifera* var. *tomentosa* are known from National Forest System lands. However, several occurrences are on lands adjacent to the Cleveland National Forest near Warner Springs (CalFlora 2000, USDA Forest Service 1998), and potential habitat may be present on National Forest System lands in that area.

Taxonomy and Natural History

Lessingia glandulifera var. *tomentosa* is a herbaceous perennial in the sunflower family (Asteraceae), blooming August through October (California Native Plant Society 2001). It is one of three varieties of *L. glandulifera*. *L. glandulifera* var. *glandulifera* is the only variety that occurs within the same range as *Lessingia glandulifera* var. *tomentosa*. *Lessingia glandulifera* var. *tomentosa* can be distinguished from var. *glandulifera* by its prostrate growth form, thickly tomentose, white to tan stems, and entire cauline leaves (Lane 1993).

Plants are white or tannish white; prostrate stems 0.5-8 dm are densely, persistently white-

tomentose. Cauline leaves are entire, oblong to ovate, with upper surface having tack-shaped glands. Basal leaves (less than 11 cm) are deciduous, oblanceolate, and toothed to pinnately lobed. Terminal discoid heads are solitary, with widely obconic involucre 5-8 mm high and phyllaries with dense nail- and tack-shaped glands, hairy, puberulent, or glabrous. There are no ray flowers, and there are 15-30 disk flowers per head. Funnel-shaped corollas are yellow with a brown band in the throat; marginal flowers have expanded limbs. Style branches are 1-2.5 mm and appendages 0.2-0.6 mm, with or without abrupt point. Fruits are 2-3mm long, with many pappus bristles in 1-2 series, free to base, white or tannish white (Lane 1993).

Habitat Description

Lessingia glandulifera var. *tomentosa* occurs in high desert chaparral on sandy soils at elevations of 2,795–3,965 feet (860–1,220 meters) (California Native Plant Society 2001, Lane 1993).

Occurrence Status

No populations of *Lessingia glandulifera* var. *tomentosa* are currently documented within the National Forest System lands.

Threats

Potential threats to *Lessingia glandulifera* var. *tomentosa* include livestock grazing and road expansion. Both known populations are within private property boundaries located in the community of Warner Springs (California Natural Diversity Database 2004).

Conservation and Management Considerations

Conservation of this species will depend on efforts outside of Forest Service actions. The following is a list of conservation practices that should be considered for *L. glandulifera* var. *tomentosa*:

- Survey potential habitat and if found, map species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Lessingia glandulifera var. *tomentosa* has not been documented from National Forest System lands, but it occurs on private property not far from the Cleveland National Forest. If populations are found on National Forest System lands, the possibility of threats to the taxon from Forest Service activities can be evaluated at that time.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability outcomes

Lessingia glandulifera var. *tomentosa* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

No populations of *Lessingia glandulifera* var. *tomentosa* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Lessingia glandulifera* var. *tomentosa*.

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Lewisia brachycalyx

Lewisia brachycalyx A. Gray (Short-sepaled lewisia)

Management Status

Federal: None

California: None

Heritage Rank: G5; S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 2-2-1

General Distribution

Lewisia brachycalyx occurs in the San Bernardino Mountains, the mountains of San Diego County, Baja California Norte, Utah, Arizona, and New Mexico (California Native Plant Society 2001).

Distribution in the Planning Area

Lewisia brachycalyx occurs in San Bernardino County in Big Bear and Holcomb valleys, Fawnskin, and near Twin Peaks on the San Bernardino National Forest (CalFlora 2002). There are also occurrences reported from Pan Hot Springs meadow, Holcomb Valley Campground, Eagle Point, and Snow Valley (Krantz et. al. draft 2000). In San Diego County, *Lewisia brachycalyx* is known to occur on grassy slopes about Cuyamaca Lake (CalFlora 2002, Beauchamp 1986) and in meadow habitat in Azalea Creek and North Peak in the Cuyamaca Mountains (Beauchamp 1986). It is not known to occur on the Cleveland National Forest, however suitable habitat may be present.

Taxonomy and Natural History

Lewisia brachycalyx is a dicotyledon in the purslane family (Portulacaceae). It is distinguished from other *Lewisia* species occurring in the San Bernardino Mountains by the pair of sepal-like bracts just below the calyx (Dempster 1993).

Lewisia brachycalyx has a short root and caudex that is stout, tapered, or often branched below. There are several to many leaves in a spreading rosette. The leaves are 2-8 cm, oblanceolate, more or less

fleshy, entire, tapered to the petiole, and have a blunt tip. There are many stems in the inflorescence. The inflorescence stems are 1-3.5 cm and have a single flower. The flowers are included in the leaves. There are two bracts closely below and more or less like the sepals. There are two sepals (but seemingly 4 due to the bracts) that are 1/3 to 1/2 the size of the corolla, obovate-obtuse to round, and entire. There are 5-9 petals that are 2-2.5 cm. The petals are oblong, white or pinkish, and have a blunt or notched tip. There are 9-15 stamens and 5-8 stigmas (Dempster 1993).

Lewisia brachycalyx is a perennial herb that blooms from February to June (California Native Plant Society 2001). This species is difficult to locate except when in flower (Reiser 1994), and populations may therefore be overlooked during surveys.

Habitat Description and Status

Lewisia brachycalyx is found in wet meadows and seeps in lower montane coniferous forests at elevations of 4,500-7,500 feet (1,370-2,300 meters) (California Native Plant Society 2001).

Meadows are fairly well distributed within the Province, but tend to occur in small pockets or along narrow corridors, comprising a low overall acreage. Meadows are subject to a variety of threats including hydrologic alteration, recreational activities, and non-native species. At some occurrences, *Lewisia brachycalyx* may occur in association with federally-listed meadow species; in these areas, *Lewisia brachycalyx* will benefit from conservation measures to protect habitat for the endangered species.

Occurrence Status

The California Natural Diversity Database (2004) does not contain any records for this species. However, there are several known occurrences. CalFlora (2002) lists the following occurrences with site-specific information. In addition, there are other known locations in Big Bear Valley and near Snow Valley (Krantz et. al. draft 2000).

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Lewisia brachycalyx* (Short-sepaled lewisia)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
1456750, 1358573	U	1892, 1886	Bear Valley, San Bernardino Mtns. Land owner: U.	SBD

1815530	U	1930	Twin Peaks Post Office, San Bernardino Mtns. Land owner: U.	SBD
*	U	2001	Fawnskin Meadow (Camp Whittle – YMCA). Large numbers of plants.	SBD
1373280, 1207775, 1272140 1424828	U	1925	Cuyamaca Lake and in field near W end of Cuyamaca Lake. Land owner: U.	SD
1182823	U	1921	Cuyamaca region. Land owner: U.	SD
*	U	U	Cuyamaca Mts. meadow habitat in Azalea Creek and North Peak. Cuyamaca State Park	SD
			Pan Hot Springs, Holcomb Valley Campground,	

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBD = San Bernardino County*
- *SD = San Diego County*

Threats

On National Forest System lands, *Lewisia brachycalyx* may be affected by recreational use and vehicle use off of National Forest System roads. Any activities that alter hydrology would affect this species. These impacts are especially pronounced in heavily used areas such as Holcomb Valley and Snow Valley. The occurrence at Eagle Point is on private land designated as a protected reserve. The Fawnskin occurrence is in a privately owned meadow with little disturbance. In Cuyamaca State Park, the occurrences may have burned in the 2003 Cedar Fire. The effects of the fire, fire suppression or unauthorized use in the habitat after the fire are unknown at this time.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Lewisia*

brachycalyx:

- Complete a Habitat Management Guide for plants that occur in springs, seeps and vernal wetlands.
- Survey all new occurrences of *Lewisia brachycalyx* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats. Document this species when found to get better idea of the range of this species and potential effects to habitat.
- Collect a herbarium voucher specimen of *Lewisia brachycalyx* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Lewisia brachycalyx* in the area using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Lewisia brachycalyx is known from several locations on the San Bernardino National Forest currently managed for the protection of riparian habitat and federally listed species that co-occur with this plant. Public education, barrier installation, trail reroutes, road decommissioning and habitat restoration have occurred in meadow habitat within Holcomb, Big Bear and Snow Valley within the last 5 years. Monitoring to ensure habitat protection measures remain effective is also a part of this effort. Implementation of the SBNF Meadow Habitat Management Guide will also induce protection for this species. Implementation of the Cleveland National Forest Meadow Habitat Management Guide will protect potential habitat on those lands.

Based upon the above analysis this species has been assigned the following threat category:

4. uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Lewisia brachycalyx* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Lewisia brachycalyx* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Lessingia glandulifera var.
tomentosa**

**Lilium humboldtii ssp.
ocellatum**

Lilium humboldtii ssp. ocellatum

Lilium humboldtii Roezl & Leichtl. ssp. *ocellatum* (Kell.) Thorne (Ocellated Humboldt lily)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G4T3, S3.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-3

General Distribution

Lilium humboldtii ssp. *ocellatum* is the southern California subspecies of the Humboldt lily. It is uncommon though widespread, occurring in the Santa Ynez and San Rafael Mountains in Santa Barbara County, the Topatopa Mountains of Ventura County, the Santa Monica Mountains and Transverse Ranges of Los Angeles County, the eastern San Gabriel and San Bernardino Mountains of San Bernardino County, the San Jacinto Mountains of Riverside County, and the Santa Ana Mountains of San Diego County (Smith 1998, Stephenson and Calcarone 1999, CalFlora 2002). *Lilium humboldtii* ssp. *ocellatum* is also found on Santa Cruz and Santa Rosa islands (California Native Plant Society 2001).

Distribution in the Planning Area

Occurrences are known on all four southern California National Forests (Stephenson and Calcarone 1999). Occurrences are known from Lucas Creek (near the Big Tujunga narrows), Trail Canyon, Wilson Canyon, and Fish Canyon on the Angeles National Forest (Bramlet and Boyd 1998, CalFlora 2002). Most occurrences on the San Bernardino National Forest center on the Deep Creek watershed, including several occurrences along Deep, Holcomb and Little Bear Creeks. Occurrences on the Los Padres National Forest range from the Casitas Pass area to San Julian Creek in the Santa Ynez Mountains, and inland to mountainous areas along Sespe Creek and its tributaries, and at Thorn Meadows (Smith 1998). On the Cleveland National Forest, it is found within the San Mateo Wilderness (CalFlora 2002) and other locations listed in table below. It is also known from the Santa Rosa Plateau.

Taxonomy and Natural History

Lilium humboldtii is a monocot in the Lily family (*Liliaceae*). Two subspecies are currently recognized: ssp. *humboldtii* and ssp. *ocellatum*. Ocellated Humboldt lily has a more southerly distribution than ssp. *humboldtii* and differs morphologically in having a yellow-orange perianth with light-margined red spots (versus an orange perianth with unmargined red spots) (Skinner 1993). Populations of short-statured plants from San Diego County have been called *Lilium humboldtii* ssp. *bloomerianum* (San Diego tiger-lily), but this subspecies is not recognized in the most current taxonomic treatments (Skinner 1993).

Lilium humboldtii ssp. *ocellatum* is a perennial herb that produces a bulb. It blooms from March to July.

Habitat Description

Lilium humboldtii ssp. *ocellatum* occurs in openings in coastal scrub, chaparral, riparian woodland, and lower montane coniferous forest (Skinner 1993, California Native Plant Society 2001). Plants on the Cleveland, Los Padres, and San Bernardino National Forests are found in riparian areas and seeps of chaparral canyons between 100 and 5,900 feet (30-1800 meters) (California Native Plant Society 2001). Occurrences on the San Bernardino National Forest also found on moist and shaded slopes in mixed conifer understory. On the Angeles National Forest, the taxon is found in riparian areas with big-leaf maple or in mixed hardwood/conifer forest. The plant generally grows on gravelly soils in drainages and canyon bottoms.

Occurrence Status

Lilium humboldtii ssp. *ocellatum* is rare, though the species exists in sufficient numbers and with a wide enough distribution that the potential for extinction is low at this time (California Native Plant Society 2001). Population trends of occurrences on National Forest System lands are not known.

OCCURRENCE DATA – *Lilium humboldtii* ssp. *ocellatum* (Ocellated Humboldt Lily)

Occurrence No. (CNDDB)	No. of Plants	Year Reported	Location/Land Owner	County
578521 (RSA)	U	1994	Liebre Mountains: Warm Springs Canyon: 0.5 road mile W of Lake Hughes Road along Forest Service road 6N32. Warm Springs Mountain USGS Quad: T6N R16W. Near 34 ° 36' 27"N 118 ° 34' 02"W. Elevation 2130-2160 feet (Ross/RSA)	LA

596373 (RSA)	U	1995	Liebre Mountains: Lower Red Fox Canyon near its confluence with Elizabeth Lake Canyon. Burnt Peak 7.5' USGS Quad: T6N R16W. Near 34 ° 37' 46"N 118 ° 31' 53"W. Elevation ca 2320-2420 ft.(Ross/RSA)	LA
377135 (RSA)	U	1932	San Dimas Canyon, San Gabriel Mountains. Alt. 1400 ft.(Wheeler/RSA)	LA
594656 (RSA)	U	1967	San Gabriel Mountains. All Trail Canyon, BM 3434 near Tom Lucas campground Elev. 3300 ft. (Wheeler/RSA)	LA
604309 (RSA)	U	1967	San Gabriel Mountains: Fish Canyon at Upper Clamshell Truck Trail, west side. T1N R10 W sec. 5. Elev. 4100 Feet.(Wheeler/RSA)	LA
610979 (RSA)	U	1970	San Gabriel Mountains: Fish Fork. T3N R8W NW/4 sec. 33. Elev. 3600 Feet.(Wheeler/RSA)	LA
547442 (RSA)	U	1992	San Gabriel Mountains: lower Shoemaker Canyon, draining to E fork of San Gabriel River, joining it at 2125 ft. elevation. Actual elevation ca 2370 feet.(Ross/RSA)	LA
229181 (RSA)	U	1971	San Gabriel Mountains, Angeles National Forest: along Lucas Creek S of Big Tujunga Narrows along Angeles Forest Road; elevation ca 3000 feet.(Thorne/RSA)	LA

68713 (RSA)	U	1924	Stream trail, 1/4 mile N of Switzers Camp, San Gabriel Mountains. Alt. 3050 ft.(Dobbs/RSA)	LA
175372 (RSA)	U	1930	Bichota Canyon, San Gabriel Mountains.(Crow/RSA)	LA
612224 (RSA)		1968	San Gabriel Mountains: North side of Bichota Canyon, east of heliport. T2N R9W SE/4 sec. 3. Elev. 4600 Feet.(Wheeler/RSA)	
226255 (RSA)	U	1971	Mystic Canyon, San Gabriel Mountains, Angeles National Forest. 2 miles NE of Glendora. Elev. 1400 ft.(Cromwell/RSA)	LA
377137 (RSA)	U	1973	Evey Canyon, San Gabriel Mountains. 0.6 mile from canyon mouth along roadside. Alt. ca. 2400 ft.(Bissing/RSA)	LA
308105 (RSA)	U	1937	Wolgums Cabin, Soldier's Creek, San Gabriel Mountains.(Ramsey/RSA)	LA
584290 (RSA)	U	1993	W end of the San Gabriel Mountains: Wilson Canyon, along the riparian strip. San Fernando 7.5' USGS quad: R15W T3N, N/2 NE/4 SW/4 sect. 15; elev. ca 1930-2040 ft.(Ross/RSA)	La
225918 (RSA)	U	1971	San Gabriel Mountains, San Bernardino National Forest: Grapevine Springs; elev. ca. 4100 ft.(Thorne/RSA)	SBD

226984 (RSA)	U	1971	San Gabriel Mountains, San Bernardino National Forest: San Sevaine Road near Grapevine Spring; elev. c. 4100 ft.(Thorne/RSA)	SBD
* (RSA)	16	2004	Near San Sevaine Cow Camp off FS Rd. 1N34 just E. of Grapevine Springs, T1N/R6W/S2 (Fraga/RSA)	
162812 (RSA)	U	1958	E. Fork San Gabriel River 3 mi north of the Fire control Station at intersection of Cattle Canyon with E. Fork(Olmstead/RSA)	LA
597358 (RSA)	U	1990	San Gabriel Mountains. "Epipactis Canyon". Un-named canyon draining ENE to Lone Pine Canyon, originating near E end of Upper Lytle Creek Ridge. [Sheep Creek Truck Road, 2N56, drops NEward through the lower half of this canyon] Cajon 7.5' USGS quad: T2N R6W SW/4 NW/4 NE/4 Section 10; elevation ca. 3380-3480 feet.(Ross/RSA)	SBD
587307 (RSA)	U	1995	NW Palomar Mountains; Agua Tibia Mountains; Cleveland National Forest, Agua Tibia Wilderness Area, W slope of Agua Tibia Mountain, SSW of the Crosley Saddle; N branch of upper Agua Tibia Creek, at the confluences of two large drainages from the E. North of the wilderness boundary. T9S R1W; NE/4, NW/4, Sec. 15. Elev. 3440 ft.(Banks/RSA)	SD

588184 (RSA)	U	1995	NW Palomar Mountains; Agua Tibia Mountains; Cleveland National Forest, Agua Tibia Wilderness Area; Along Wildhorse Trail, S of lower Arroyo Seco, NW of Wildhorse Peak. In major drainage that flows off NW flank of Wildhorse Peak. T8S R1W; SE/4, NE/4, Sec. 27; 33 ° 22'.046 N - 116 ° 57'.798 W. Elev. 2000 ft.(Banks/RSA)	RIV
596150 (RSA)	U	1996	NW Palomar Mountains; Agua Tibia Mountains; Pechanga Indian Reservation, E of San Gabriel Church; At the end of the main road in the Reservation, approximately 200 m NW of the spring on the northern fork of Pechanga Creek at the E end of the Reservation. T8S R2W; SE/4, NW/4, Sec. 36. Elev. 1500 ft. (Banks/RSA)	RIV
634229 (RSA) 584231 (RSA)	U	1969 1993	San Gabriel Mountains: San Bernardino National Forest. Tributary to Lytle Creek Canyon near to mouth.. Elev. 2500 Feet. (Thorne/RSA) San Gabriel Mountains. Unnamed canyon. Lytle Creek entrance to canyon at 2.0 miles north of San Sevaine Road on west side of Lytle Creek. T2N, R6W, NE/4 (SE/8) sec. 35 Devore quad. Elevation 3100 ft.(Swinney/RSA)	SBD

649674 (RSA)	U	2000	NCCP North Ranch Policy Plan Area. N Fremont Canyon at Donaldson Ranch adjacent to powerline crossing on W fork of Fremont Canyon drainage. USGS 7.5' Quad: Black Star Canyon. UTM Zone 11S; N3743344, E437756. Elevation: ca. 1400 ft. (Riefner/RSA)	ORA
377138 (RSA)	U	1955	Horsethief Canyon, Elsinore Mountains.(Sphon/RSA)	RIV
221033 (RSA)	U	1966	Santa Ana Mountains. 4 miles W of Corona between Tin Mine Canyon & Santiago Peak, Skyline Drive. Elev. 2000 ft.(Lathrop/RSA)	RIV
192244 (RSA)	U	1966	At Fisherman's Camp in Tenaja Canyon, about 13 miles SW of Murrieta (Zuill/RSA)	RIV
594624 (RSA)	U	1996	Yucaipa/ Oak Glen Area; "Johnson Canyon" (local name, not on map). Directly S of Wood Acres Apple Ranch, just E of intersection of Potato Canyon Road and Oak Glen Road. USGS Forest Falls 7.5 Quad: T1S R1W: S34 (NE/4) & adjacent S27. 34 ° 3'N, 116 ° 58'W. Elev. 4000-4300 ft.(White/RSA)	SBD
564509 (RSA)	U	1993	San Bernardino Mountains: Upper Warm Springs Canyon, along Forest Service Road 1S12, 0.6 mile below junction w/ Road 1N12. (117 ° 02'W, 34 ° 07'N; T1S, R2W, central 1/3 of E/2 of SE/4 sec. 1.) Elev. 3800 ft.(Sanders/RSA)	SBD

222965 (RSA)	U	1971	Day Canyon, San Bernardino National Forest; elev. 3600 ft. [label w/ map](Benny/RSA)	LA
303673 (RSA)	U	1979	Canyon Branch at Skyline near Crestline at headwaters of Waterman Canyon, elev. ca. 4650 ft.;	SBD
597655 (RSA)	U	1993	Volcan Mountain, Rutherford Ranch, E slope of Oak Ridge. 33°08'15"N, 116°36'55"W. T12S R4W Sec.7 SW/4 of SW/4 . Elev. ca. 1615 m.(Levin/RSA)	SD
573443 (RSA)	U	1994	Southern Santa Ana Mountains, San Mateo Canyon Wilderness Area, Cleveland National Forest, along Cold Springs Creek, downstream a short distance from the last crossing of the Clark Trail. T8S R5W SW/4 SW/4 Sec. 8, near border with Sec. 18. Elevation 1400 ft.(Boyd/RSA)	SD
334661 (RSA)	U	1985	Lower Cottonwood Canyon, near its confluence with De Luz Creek. (Boyd/RSA)	SD
312046 (RSA)	U	1954	San Roque Canyon, San Roque Creek Drainage Area, Santa Ynez Mountains. Alt. 400 ft.(Ellis/RSA)	SB

656673 (RSA)	U	1980	Verdugo Mountains Region: At base of trail, south end of Hinderberg Park, bottom of Dunsmore Ave., La Crescenta. Elev. 1700 Feet.(Thorne/RSA)	LA
17014 (RSA)		1997	Verdugo Hills, La Tuna Canyon Park on La Tuna Canyon 1 mile W of I-210. One half mile up stream. (Dilley/RSA)	
*	26	2004	San Bernardino Mts., Cedar Creek 3.6 km E. of Emerald Bay, Lake Arrowhead, T2N/R3W/S18 (Roberts)	SBD
*	161	2004	Keller Peak Quad, Section 16,SE ¼ of NE ¼ (Hawke, R.T.)	SBD
*	631	2004	Rouse Meadow, N of 2N26Y, W of 3N34, S of 2N25E of 2N26 Section 12 of the Lake Arrowhead Quad (Hawke, R.T.)	SBD
*	500	2004	Rouse Meadow, Lake Arrowhead Quad Section 7, Se ¼ of NW ¼ (Hawke, R.T.)	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *RSA = Rancho Santa Ana Botanic Garden*
- *LA = Los Angeles County*
- *SD = San Diego County*
- *RIV = Riverside County*
- *ORA = Orange County*

Threats

This subspecies is subject to both natural and anthropogenic threats. Habitats in which the plants occur are subject to natural flooding and erosion, and plant occurrences are vulnerable to activities that affect natural water flows. Altered fire regimes in some areas have led to stand densification upslope of riparian areas, which in turn has caused reduced base flows. Two occurrences of *Lilium humboldtii* ssp. *ocellatum* were recently (Dobrolowski 2004a, 2004b) discovered on the Los Padres National Forest and these two occurrences are not threatened by current land uses, including dispersed recreation. The lack of vulnerability in these two occurrences is due to their location on relatively steep slopes that are not subject to dispersed recreation use.

Dispersed recreation in riparian areas and fuels and vegetation treatments are the primary threat to *Lilium humboldtii* ssp. *ocellatum* on National Forest System lands. Of the estimated 13,826 acres of riparian habitat in the province, about 8.8 percent or 1,218 acres are found in areas likely to be subject to the impacts of dispersed recreation. On the Angeles National Forest, from 9.1 to 14.8 percent of the riparian habitats are subject to dispersed recreation indicating that populations of *Lilium humboldtii* ssp. *ocellatum* on the ANF may be at higher risk of being impacted from this activity.

Future fuels and vegetation treatments may threaten occurrences, although most occurrences are in Riparian Conservations Areas where impacts will be minimized or avoided.

Conservation and Management Considerations

Locate historic populations. Populations near trails and other areas with high visitor activity should be monitored. If these populations appear to be in decline, then measures such as signage, visitor education, or restrictions to visitor access should be implemented. The species is included in a conservation strategy for coastal sage scrub (USDA Forest Service, USDI Fish and Wildlife Service, and California Department of Fish and Game 1997). Implement actions in this strategy to the extent practicable.

Evaluation of Current Situation and Threats on National Forest System Lands

Lilium humboldtii ssp. *ocellatum* has a widespread distribution but is naturally uncommon and is found in riparian habitats that are susceptible to trampling and the indirect effects of roads and trails. Where it is found in upland habitat the primary threat is from fuels and vegetation treatments.

Based upon the above analysis *Lilium humboldtii* ssp. *ocellatum* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Lilium humboldtii ssp. *ocellatum* is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Lilium humboldtii* ssp. *ocellatum* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Lilium humboldtii ssp. *ocellatum* habitat is stable, or will stabilize, under alternatives 2, 3, 4, 4a, and 6. Use of Critical Biological land use zones and increased emphasis on the management and protection of riparian dependent resources would help maintain impacts at their current level or in local instances, remove existing threats. Under alternative 5, there are no critical biological land use zones and this, combined with the increased emphasis on motor vehicle based recreation, would likely result in increased impacts from dispersed recreation. Higher levels of impact would further degrade habitat and because of the small size of both habitat patches and populations of *Lilium humboldtii* ssp. *ocellatum* this habitat degradation could lead to the extirpation of isolated occurrences. Protection afforded by Wild and Scenic River eligibility will be the same across all alternatives.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

Because of the high degree of development that has occurred in southern California, and the associated need for flood protection, substantial amounts of foothill habitat for *Lilium humboldtii* ssp. *ocellatum* has likely been lost. Additional loss of habitat on private land is expected to occur as development on private lands in southern California continues. This will likely result in the extirpation of occurrences of *Lilium humboldtii* ssp. *ocellatum*.

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Lilium parryi

Lilium parryi S. Watson (Lemon lily)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3; S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-2 (California Native Plant Society 2001).

General Distribution

Lilium parryi occurs in the eastern Transverse Ranges (San Gabriel and San Bernardino Mountains) and northern Peninsular Ranges (San Jacinto Mountains, Volcan and Palomar Mountains) from Los Angeles County to San Diego County (California Native Plant Society 2001, Skinner 1993). It occurs with lesser abundance in the Santa Rita and Huachuca Mountains of Arizona and in adjacent ranges in Sonora, Mexico (USDA Forest Service 2002a). The California Natural Diversity Database (2004) lists 53 occurrences.

Distribution in the Planning Area

Lilium parryi occurrences are recorded on the Angeles, San Bernardino, and Cleveland National Forests. There are no known extant populations of *Lilium parryi* on the Cleveland National Forest; in some cases, *Lilium humboldtii* ssp. *ocellatum* was incorrectly identified as *Lilium parryi* (USDA Forest Service 2002b). *Lilium parryi* occurs adjacent to National Forest System lands at Palomar Mountain State Park (California Native Plant Society 2001). On the Angeles National Forest, this species has been found on the Arroyo Seco, Mount Baldy, and Valyermo Ranger Districts (Mistretta and Parra-Szjij 1991). *Lilium parryi* is most abundant on the San Bernardino National Forest. It occurs in the San Jacinto and San Bernardino Mountains, with at least three distinct occurrences on the Cajon Ranger District at the eastern end of the San Gabriel Mountains. Several occurrences are within the San Gorgonio Wilderness Area (USDA Forest Service 2002a).

Taxonomy and Natural History

Lilium parryi is a monocotyledon in the lily family (Liliaceae). It is a perennial bulbiferous herb that blooms July-August (California Native Plant Society 2001). *Lilium parryi* is under 2.5 m. It has a horizontal bulb that is rhizome like with 0, 2, or 4-segmented scales. The longest scales are 9-37 mm. The leaves are 7-29 cm in 1-8 whorls or scattered in young plants. The leaves are sometimes narrowly linear and the margin is not wavy. The inflorescence is characterized by 1-31 flowers that are horizontal or more or less nodding. The flowers are generally slightly bilateral, trumpet-shaped, and strongly fragrant. The perianth segments are 7-11 cm, 40% recurved with outer segments less than the inner ones. The segments are more or less oblanceolate, bright yellow, and have generally sparse maroon spots that are minute. The stamens are more or less equal to the perianth and the filaments are more or less parallel. The anthers are 8-14 mm and are pale magenta-brown with rusty or brown-orange pollen. The pistil is 5-10 cm. The fruit are 4-6 cm (Skinner 1993).

Lilium parryi is an outcrossing species and may be susceptible to the effects of inbreeding. Hawkmoths are the primary pollinators of this species (Mistretta and Parra-Szjij 1991).

Lilium parryi has showy flowers that make it attractive to collectors. The seeds of *Lilium parryi* are short-lived, perhaps viable for one or two years under natural conditions (Newman 1990). It is also suspected that individual plants live only up to about four years (Mistretta and Parra-Szjij).

Habitat Description

Lilium parryi requires year-round moisture. Plants are found in moist meadows, springs, seeps, and streambanks in montane coniferous forests at elevations of 4,260-8,625 feet (1,300 - 2,630 meters) (Winter 1991, California Native Plant Society 2001). It is often associated with *Veratrum californicum*, *Pteridium aquilinum*, and *Salix* spp.

Within the planning area, riparian habitat, springs, seeps, and moist meadows are well distributed, but these habitats tend to occupy small pockets and corridors, comprising much less acreage than surrounding forest and woodland communities. These habitats are threatened by recreational uses and water developments. In addition, trails and roads are often situated in close proximity to these habitats.

Occurrence Status

There are 29 recorded occurrences of *Lilium parryi* on the San Bernardino National Forest (California Natural Diversity Database 2004) and 12 additional occurrences which have not yet been recorded. Six of the known occurrences are within the San Gorgonio Wilderness Area. There are 13 known occurrences on the Angeles National Forest, one of which is in the Sheep Mountain Wilderness Area, and six of which are in or near the Crystal Lake Recreation Area.

In general, populations at higher elevations are larger (some comprising more than 1,000 plants) than

those at lower elevations. One occurrence at Big Cienega Springs in the San Gabriel Mountains has exhibited high variation. In 1990, 345 individual plants were counted, in 1995 only 11 individuals were seen, but in 2000, 643 were observed. (California Natural Diversity Database 2004). There is also an undocumented locality that was apparently extirpated by collecting activity in summer 1989 (Mistretta and Parra-Szjij 1991).

The following table shows the number of occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Lilium parryi* (lemon lily)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1984	Boulder Creek, outlet of Cuyamaca Lake, Cuyamaca Mtns. Historical site. Species apparently extirpated from this vicinity. Land owner: U	SD
2	> 6	U	French Creek, above Lower French Valley, Palomar Mountain. Land owner: U	SD
3	U	U	Palomar Mountain State Park, near vicinity of pond that is in upper Doane Valley.	SD
4	U	1974	Cedar Spring, Santa Rosa Mountains. SBNF.	RIV
5	50-60	1983	Idyllwild County Park along Lily Creek, San Jacinto Mountains. Collections from 'Idyllwild' and 'Strawberry Valley' are attributed to this occurrence.	RIV

7	530 in 1983	1983, 1989	N Fork San Jacinto River near Dark Canyon Campground, San Jacinto Mountains. Two sites: upstream from FR02 and 0.2 mi. S of campground. SBNF.	RIV
8	600	1999	NW of Marion Ridge, S of multiple campgrounds and along Stone Creek. Site disturbance from foot traffic, trampling. Sandy substrate w/ <i>Calocedrus decurrens</i> , <i>Abies concolor</i> , <i>Pinus coulteri</i> , <i>Polypodium hesperium</i> , <i>Aquilegia formosa</i> , <i>Pinus jeffreyi</i> , <i>Rosa</i> sp., <i>Mimulus cardinalis</i> , <i>Ribes nevadensis</i> , <i>Quercus kelloggii</i> , <i>Rhododendron occidentale</i> . Mt. San Jacinto State Park.	RIV
9	U	1966	Fuller Mill Creek, San Jacinto Mountains. In stream bed and mossy banks with <i>Polygonum</i> and <i>Mimulus</i> . SBNF.	RIV
11	168 in 1992, 152 in 1993	1993	Hall Canyon above the James Reserve along Indian Creek, San Jacinto Mountains. UC-Riverside Riparian Zone.	RIV
12	20-30	1983	North Fork San Jacinto River upstream from FR5S09 (San Jacinto Ridge Truck Trail), San Jacinto Mountains. SBNF.	RIV
13	10	1983	Black Mountain Creek just N of Hwy 243, San Jacinto Mountains. SBNF.	RIV

14	U	1984	South Fork Whitewater River, Lemon Lily Meadows, San Bernardino Mountains. SBNF.	SBD
15	U	1940	Dollar Lake Canyon, San Gorgonio Pass, San Bernardino Mountains. Moist canyon. SBNF-San Gorgonio Wilderness.	SBD
16	U	1924	South Mission Creek, San Bernardino Mountains. Along upper reaches of S. Fork Mission Creek near San Gorgonio Wilderness boundary. Rare in marsh. SBNF.	SBD
17	> 1000	1990	Vivian Creek, San Bernardino Mtns. ca. 0.25 mi. from Mill Creek. Riparian habitat w/in yellow pine forest. w/ <i>Pinus ponderosa</i> , <i>Abies concolor</i> , <i>Calocedrus</i> , <i>Salix</i> , <i>Mimulus cardinalis</i> , <i>Carex senta</i> , <i>Heracleum sphondylium</i> , <i>Sphenosciadium capitellatum</i> . SBNF; San Gorgonio Wilderness.	SBD
18	25	1993	Falls Creek, Dobbs Cabin site, San Bernardino Mtns. Streamside and wet meadow w/ <i>Carex</i> spp., <i>Pteridium aquilinum</i> . Mapped from Wilderness boundary upstream ca. 0.3 mi. to fork in creek. Little evidence of disturbance. SBNF-San Gorgonio Wilderness.	SBD
19	37 in 1992, 5 in 1993	1993	Green Canyon, SE of Moonridge, San Bernardino Mtns. Exact location U. SBNF.	SBD

20	150 in 1983, 136 in 1994	2000	S. Fork Santa Ana River, from S. Fork Meadows downstream to wilderness boundary, San Bernardino Mtns. Most plants on W side of river. Montane riparian w/ <i>Salix lasiolepis</i> , <i>Abies concolor</i> , <i>Calocedrus</i> , <i>Pinus jeffreyi</i> , <i>P. murryana</i> , <i>Carex senta</i> , <i>Ribes nevadensis</i> , <i>Equisetum hyemale affine</i> , <i>Heracleum lanatum</i> , <i>Geranium</i> , <i>Geum</i> . <i>Taraxacum californicum</i> also occurs. Threat = collection. SBNF-San Gorgonio Wilderness.	SBD
21	U	1924	Lost Creek, San Bernardino Mtns. Moist bank. SBNF/San Gorgonio Wilderness.	SBD
22	40	2000	Along Bow Canyon, S of Moonridge, Bear Valley. Meadow w/ <i>Veratrum</i> , <i>Salix scouleriana</i> . SBNF	SBD
23	U	1959	Siberia Creek below Bluff Lake. Edge of creek and damp slopes. Includes collections from 'Bluff Lake Creek'. SBNF.	SBD
24	U	1984	Bluff Lake. Wet meadow w/ <i>Castilleja lasiorhyncha</i> , <i>Perideridia parishii</i> , <i>Poa atropurpurea</i> , <i>Sidalcea pedata</i> , <i>Taraxacum californicum</i> . Wildlands Conservancy.	SBD

25	20+	1994	S shore of Big Bear Lake. Vicinity of Fisher Cove. Colony near Kidd Cove (just E of peninsular that forms E side of Kidd Cove) growing in wet meadow w/ <i>Polygonum bistortoides</i> , <i>Carex</i> , <i>Stachys albens</i> , <i>Ribes nevadensis</i> . Colony near Fisher Cove along streambed at SW edge of Fisher Cove. SBNF.	SBD
26	250	1983	Near Red Ant Canyon along FR 2N17. Site mapped near Pine Knot Rd., but collection may have been from campground or elsewhere. SBNF.	SBD
27	195 in 1983, 327 in 1992, 759 in 1993	1993	Metcalf Creek at crossing w/ FR 2N10. Wet meadow in <i>Pinus ponderosa</i> forest. w/ <i>Veratrum californicum</i> , <i>Solidago</i> , <i>Pteridium aquilinum</i> , <i>Habenaria dilatata</i> , <i>Aquilegia formosa</i> , <i>Salix</i> . SBNF.	SBD
28	35 in 1983 and 2000	1983	North Creek at crossing w/ FR 2N10. Wet meadow and stream bottom in yellow pine forest w/ <i>Veratrum californicum</i> , <i>Pteridium aquilinum</i> , <i>Lupinus</i> , <i>Salix</i> . SBNF.	SBD
29	U	1910	Seven Oaks, San Bernardino Mtns. Land owner: U.	SBD

30	U	1976	Along stream in Boulder Bay, Big Bear Lake. w/ <i>Epilobium</i> , <i>Carex</i> , <i>Pteridium aquilinum</i> . Mapped along slopes S of Boulder Bay. Land owner: U.	SBD
31	21 in 1992, 26 in 1993	1993	Elsie Caves (btw. Metcalf Cr. and Red Ant Cyn, S of FR 2N17), San Bernardino Mtns. SBNF.	SBD
32	U	1921	North Fork of Bear Creek. SBNF.	SBD
33	1	1991	SE end of Green Valley, ca. 0.3 mi. SE of Green Valley Camp, San Bernardino Mtns. Small wet meadow/spring adj. to riparian area in mixed conifer forest. Threats = collection, road maintenance, ORV use. SBNF.	SBD
34	1 in 1993	2000	Camp Conifer in Running Springs. Past impact from trail use. Small wet meadow w/in mixed conifer forest. Mapped along N side of the camp. SBNF.	SBD
35	95 in 2 colonies in 1992, 110 in 3 colonies in 1993	1993	Little Green Valley, San Bernardino Mountains. SBNF.	SBD
36	U	1902	Deep Creek, San Bernardino Mtns. Mapped N of Running Springs. SBNF.	SBD
37	9 in 1992, 2 in 1993, 0 in 1994, 3 in 1995	1992	San Sevaine Cow Camp, SE base of San Gabriel Mtns. Springy hillside above grassy flat. SBNF.	SBD

38	11 in 1991, 56 in 1992, 121 in 1993	1993	Bear Flat, along Bear Cyn., N of town of Mt. Baldy, San Gabriel Mtns. Montane meadow, white alder riparian forest, ponderosa forest w/ <i>Calocedrus</i> , <i>Alnus rhombifolia</i> , <i>Urtica urens</i> , <i>Epilobium</i> , <i>Pteridium aquilinum</i> , <i>Rhamnus californica</i> , <i>Helenium bigelovii</i> on NE edge of flat. Development of water sources, collection, recreation are threats. ANF.	SBD
39	5 in 1991, 4 in 1992, 35 in 1994, 57 in 1995, 26 in 1996	1992	Unnamed tributary to Coldwater Cyn., San Gabriel Mtns. ca. 0.5 mi. NNE of Baldy Notch. In dappled shade in understory of <i>Alnus rhombifolia</i> . Deer and bears impact these plants. SBNF.	SBD
40	10	1990	Cedar Canyon W of Telegraph Peak, San Gabriel Mtns. White alder riparian forest and ponderosa pine forest w/ <i>Clematis</i> , <i>Mimulus cardinalis</i> , <i>Urtica urens</i> , <i>Carex</i> , <i>Gayophytum</i> , <i>Oenothera</i> , <i>Sambucus mexicanum</i> , <i>Epilobium incanum</i> . Near Cedar Flats Campground at JCT of Cedar Cyn. and Chapman Trail. Threats = water development, collecting, recreation. ANF.	SBD

41	300 in 1990, 126 in 1993	1993	Vincent Gulch, just S of Hwy 2 at Wilderness Boundary, San Gabriel Mtns. Along N side of Vincent Gulch Trail, ca. 0.25 mi. SE of trailhead. In area where trail first enters conifers. Sierran mixed conifer forest w/ <i>Abies concolor</i> , <i>Calocedrus</i> , <i>Pinus jeffreyi</i> , <i>Quercus chrysolepis</i> , <i>Equisetum</i> , <i>Ribes nevadense</i> , <i>Carex</i> , <i>Solidago</i> , <i>Epipactus gigantea</i> , <i>Castilleja</i> , <i>Epilobium</i> , <i>Helenium bigelovii</i> . Threats = water source development, collecting, recreation. ANF-Sheep Mtn. Wilderness Area.	LA
42	U	1936	Prairie Fork of San Gabriel River, vicinity of LA/SBD county line. Habitat includes cienega w/ <i>Habenaria sparsiflora</i> , <i>Carex</i> . Near small spring and marshy ground in small side canyon. ANF.	LA, SBD
43	1 in 1983, 2 in 1990	1990	Cortleyou Spring, N of Crystal Lake Rec. Area. White fir forest. Small seep that has been walled off on 3 sides. Plants near wettest areas with <i>Salix</i> . ANF.	LA
44	7 in 1991, 197 in 1993	1993	Windy Springs, N of Crystal Lake Rec. Area. Ponderosa pine forest. ca. 100 yards above and to W of springs. Beneath incense cedar and Jeffrey pine and adj. to a large, dense stand of <i>Helenium bigelovii</i> . Also w/ <i>Ceanothus cordulatus</i> , <i>Ribes nevadense</i> , <i>Carex</i> , <i>Potentilla</i> . ANF.	LA

45	8 in 1990, 29 in 1993	1993	<p>Little Jimmy Springs, N of Crystal Lake Rec. Area. Sierran mixed conifer forest w/ <i>Pinus ponderosa</i>, <i>Ceanothus cordulatus</i>, <i>Ribes</i>, <i>Helenium bigelovii</i>, <i>Carex</i>, <i>Salix</i>. One plant in <i>Ribes</i> thicket on W slope, 7 plants below spring w/ <i>Ribes</i>, <i>Carex</i>, and <i>Ceanothus</i> nearby. ANF.</p>	LA
46	7 in 1983, 16 in 1990	1990	<p>Lily Springs, N of Crystal Lake Rec. Area. Sierran mixed conifer forest and so. CA white fir forest w/ <i>Ribes nevadense</i>, <i>Veratrum californicum</i>, <i>Epilobium</i>, <i>Castilleja stenatha</i>, <i>Mimulus cardinalis</i>, <i>Abies concolor</i>, <i>Pinus murrayana</i>, <i>P. jeffreyi</i>. Plants in close proximity to wet, shaded area near top of drainage. ANF.</p>	LA
47	345 in 1990, 623 in 2000	1990	<p>Big Cienega Springs, Crystal Lake Rec. Area. Montane meadow w/in ponderosa forest. In wet ground in partial shade of open woodland w/ <i>Calocedrus</i>, <i>Pinus jeffreyi</i>, <i>Abies concolor</i>, <i>Sequoiadendron</i>, <i>Quercus chrysolepis</i>, <i>Mentha</i>, <i>Carex</i> cf. <i>occidentalis</i>, <i>Eleocharis montevidensis</i>, <i>Juncus</i> cf. <i>balticus</i>, <i>Helenium bigelovii</i>. Largest known occ. in San Gabriel Mtns. Located alongside and above a fire road. Hydrant and diversion pipe have been developed at head of spring. ANF.</p>	LA

48	46	1990	Alexander Spring, Crystal Lake Rec. Area. Along small seep in deep shade of heavily wooded area. Ponderosa pine forest w/ <i>Calocedrus</i> , <i>Alnus rhombifolia</i> , <i>Pinus jeffreyi</i> , <i>Carex</i> . ANF.	LA
49	185	1990	Springs along Soldier Creek, Crystal Lake Rec. Area. Southern end of flat in damp meadows and along drainage in partial to heavy shade. Trash, trampling, weedy <i>Hedera helix</i> are threats. Montane meadow and white alder riparian forest w/ <i>Calocedrus</i> , <i>Alnus rhombifolia</i> , <i>Mimulus cardinalis</i> , <i>Carex</i> , <i>Aquilegia</i> , <i>Artemisia dracunculus</i> , etc. ANF.	LA
50	20 in 1983, 19 in 1990	1990	Lamel Spring, N of Mt. Baden-Powell. On Trail 2W08 near Pacific Crest Trail. Sierran mixed conifer forest w/ <i>Pinus lambertiana</i> , <i>Abies concolor</i> , <i>Mimulus cardinalis</i> , <i>Dodecatheon redolens</i> , <i>Helenium bigelovii</i> , <i>Epilobium</i> , <i>Sisyrinchium bellum</i> , <i>Ribes nevadense</i> , <i>Arctostaphylos</i> . <i>Botrychium crenulatum</i> also collected here. Area w/in or near large fire in 2002. ANF.	LA

51	50-60 in 1983, 286 in 1990	1990	Buckhorn Flats, NW of Waterman Mtn., San Gabriel Mtns. Buckhorn Flats Campground and along drainage N of campground to 6000'. White alder riparian forest and ponderosa pine forest w/ <i>Alnus rhombifolia</i> , <i>Salix</i> , <i>Ribes nevadense</i> , <i>Mimulus cardinalis</i> , <i>M. guttatus</i> , <i>Aquilegia formosa</i> , <i>Vicia</i> , <i>Boykinia rotundifolia</i> , <i>Carex</i> . ANF.	LA
52	43	1990	Little Rock Creek, just upstream from Cooper Cyn., ENE of Waterman Mtn., San Gabriel Mtns. White alder riparian forest and ponderosa pine forest. Along creek and adj. moist areas. w/ <i>Alnus rhombifolia</i> , <i>Salix</i> , <i>Abies concolor</i> , <i>Calocedrus</i> , <i>Quercus chrysolepis</i> , <i>Pteridium aquilinum</i> , <i>Elymus</i> , <i>Aquilegia formosa</i> , <i>Helenium bigelovii</i> , <i>Ribes</i> , <i>Lupinus</i> . ANF.	LA
53	20	1998	Gordon Springs, N slope of San Bernardino Mtns. Desert spring surrounded by canyon live oak stand. N-facing slope w/ limestone soils, filtered light. w/ <i>Fraxinus velutina</i> , <i>Aquilegia ternata</i> , <i>Sisyrinchium bellum</i> , <i>Epipactis gigantea</i> , <i>Amelanchier utahensis</i> , <i>Juncus</i> . Spring development. Spring illegally bulldozed and plants may have been harvested. SBNF.	SBD

54	24 in 1992, 1993	1993	Snow Slide, San Bernardino Mtns. Mapped at Snow Slide Spring along N slope of Butler Peak. SBNF.	SBD
55	6	1994	N Fork of Mission Creek, upper reaches of creek, San Bernardino Mtns. Montane riparian habitat w/ intermittent creek. w/ <i>Salix lasiolepis</i> , <i>Carex senta</i> , <i>Ribes</i> , <i>Lupinus polyphylla</i> , <i>Castilleja miniata</i> ssp. <i>miniata</i> , <i>Mimulus moschatus</i> , <i>Epilobium ciliatum</i> , <i>Poa pratensis</i> . Shady w/ granitic soils. Along Pacific Crest Trail ca. 0.5 mi. E of FR 1N05 at junction w/ road to Mission Creek Camp. PVT in SBNF.	SBD
*	4	2002	Upper Horse Meadow (westernmost meadow), E of San Y Ca Spring; San Bernardino Mtns. Dry meadow area. Plants growing under <i>Pinus jeffreyi</i> w/ <i>Pteridium aquilinum</i> var. <i>pubescens</i> , <i>Juncus mexicanus</i> , <i>Carex senta</i> . No apparent human activity. SBNF.	SBD
*	2	2002	Upper Horse Meadow. Easternmost meadow (spring area E of San Y Ca Spring and W of Poopout Hill, below S. Fork Trail). Under <i>Pinus jeffreyi</i> and <i>Abies concolor</i> w/ <i>Pteridium aquilinum</i> var. <i>pubescens</i> , <i>Geranium richardsonii</i> , <i>Viola</i> sp., <i>Achillea millefolium</i> , <i>Carex senta</i> , <i>Poa pratensis</i> . SBNF.	SBD

*	58	2002	<p>Headwaters of Frog Creek, easternside of Horse Meadows, NW of Poopout Hill. Moist, dark-brown clay loam. Wet drainage at eastern edge of meadow in mixed conifer forest of <i>Pinus jeffreyi</i>, <i>Calocedrus decurrens</i>, <i>Abies concolor</i> w/ <i>Salix scouleriana</i>, <i>Carex senta</i>, <i>Pteridium aquilinum</i> var. <i>pubescens</i>, <i>Lotus oblongifolius</i>, <i>Geranium richardsonii</i>, <i>Poa pratensis</i>, <i>Ribes cereum</i>, <i>Stachys albens</i>, <i>Rosa woodsii</i>, <i>Equisetum hyemale</i>, <i>Elymus glaucus</i>, <i>Ceanothus cordulatus</i>, <i>Arctostaphylos patula</i>. Foot traffic through dry meadow W of drainage. SBNF.</p>	SBD
*	125	2002	<p>Knickerbocker Canyon, San Bernardino Mtns. Mostly along shady edges of moist meadow in canyon bottom. ENE-facing and NNE-facing slopes 0-10 ° . In mixed conifer forest of <i>Abies concolor</i>, <i>Calocedrus decurrens</i>, <i>Pinus jeffreyi</i>. Meadow dominated by <i>Carex senta</i>, <i>Epilobium angustifolium</i> and w/ <i>Lupinus latifolius</i>, <i>Pteridium aquilinum</i> var. <i>pubescens</i>, <i>Sphenosciadium capitellatum</i>, <i>Smilacina stellata</i>, <i>Ribes nevadense</i>, <i>Geranium richardsonii</i>, <i>Veratrum californicum</i>, <i>Fragaria vesca</i>, <i>Aquilegia formosa</i>. Foot trail along eastern side of meadow through canyon. SBNF.</p>	SBD

*	175+	2002	<p>Green Canyon, S of trail 2E18, San Bernardino Mtns. Along wet stream channel in canyon bottom and seepy areas on W-facing slope above. Mixed conifer forest of <i>Abies concolor</i>, <i>Pinus jeffreyi</i>, <i>Juniperus occidentalis</i> w/ <i>Salix lasiolepis</i>, <i>Sphenosciadium capitellatum</i>, <i>Geranium richardsonii</i>, <i>Mimulus guttatus</i>, <i>Hypericum formosum scouleri</i>, <i>Ribes nevadense</i>, <i>Carex</i>, <i>Epilobium</i>, <i>Aquilegia formosa</i>, <i>Sidalcea malvaeflora</i> ssp. <i>dolosa</i>, <i>Smilacina stellata</i>, <i>Thalictrum sparsiflorum</i>, <i>Stachys albens</i>, <i>Poa pratensis</i>, <i>Castilleja miniata</i>. Hiking trail to NNE along canyon bottom. Several plants with tops cut off. SBNF.</p>	SBD
*	> 5 in 1990, 55 in 1991, 55 in 2002	1990	<p>Eastern edge of Little Green Valley, N of Green Valley Trail 2W10. Open meadow w/ <i>Veratrum californicum</i>, <i>Carex senta</i> w/in mixed conifer forest of <i>Pinus jeffreyi</i>, <i>Abies concolor</i>. Also w/ <i>Pteridium aquilinum</i>, <i>Lupinus latifolius</i>, <i>Lotus oblongifolius</i>, <i>Stachys albens</i>. SSW-facing gently slope at edge of meadow. Foot trail along edge of meadow. Paintball activity. Buildings on NW side bulldozed recently w/ several new access roads bulldozed through meadow. These plants are near those noted in occurrence 35 but in a different drainage. Additional plants among willows along 2W10 into Snow Valley. SBNF.</p>	SBD

*	4	2002	Small meadow along N side of FR 2N13; 3.1 mi. W of jct. Of 3N14 and 2N13. Small, dry N-facing drainage along western edge of small, open meadow in mixed conifer forest of <i>Abies concolor</i> , <i>Pinus jeffreyi</i> . W/ <i>Ribes cereum</i> , <i>Rosa woodsii</i> <i>ltramontane</i> , <i>Carex senta</i> , <i>Pteridium aquilinum</i> var. <i>pubescens</i> , <i>Lupinus latifolius</i> , <i>Poa pratensis</i> , <i>Calocedrus decurrens</i> , <i>Veratrum californicum</i> , <i>Ribes nevadense</i> . Dirt road at S side of drainage. SBNF.	SBD
*	53	2000	Wet meadow on hillside N of Hwy 18, W of Boyer Boat Launch. W/ <i>Rosa woodsii</i> , <i>Geranium richardsonii</i> , <i>Poa pratensis</i> , <i>Muhlenbergia rigens</i> , <i>Scirpus microcarpus</i> , sedges, and rushes. No visible disturbance. SBNF.	SBD
*	~50	2000	Fish Creek Meadows. In shade of <i>Pinus jeffreyi</i> , other conifers at edge of meadow w/ <i>Carex</i> , grasses, and <i>Pteridium aquilinum</i> . Threats: hikers, collectors. SBNF-San Gorgonio Wilderness.	SBD
*	1	1990s	Dry Creek adjacent to Deer Lick Fire Station. SBNF.	SBD
*	U	1990	Dry Creek just north of Running Springs. Private land.	SBD

*	U	1990s	Unnamed tributary to the North Fork of Deep Creek. A few plants seen among the dense willows. SBNF.	SBD
*	U	U	N. Fork of the San Jacinto River in Mt. San Jacinto State Park from a map provided by the State Park.	RIV
*	U	U	Unnamed tributary to Tahquitz Creek in Mt. San Jacinto State Park.	RIV
*	~50	1996	Flume Canyon south of Wrightwood. ANF.	SBD
*	~40	2001	Unnamed tributary to Holcomb Creek, east of Crab Creek and north FR 2N13. SBNF.	SBD
*				

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *SD = San Diego County*
- *LA = Los Angeles County*
- *RIV = Riverside County*

Threats

The major threats to *Lilium parryi* are damage to individual plants and habitat by hikers, campers, and other recreationists, horticultural and casual collectors, and diversion and development of water sources (Mistretta and Parra-Szjij 1991, Winter 1991, California Native Plant Society 2001, USDA Forest Service 2002a). *Lilium parryi* is particularly vulnerable to casual picking because of its large, showy flowers and occurrence in easily accessible habitats. The small size of most occurrences and inherent biological attributes, such as short-lived seeds, increase their vulnerability to these threats (Mistretta and

Parra-Szijj 1991).

Occurrences within the Crystal Lake Recreational Area of the Angeles National Forest may be threatened by high levels of recreational use.

Occ. no. 47 may be threatened by the hydrant and diversion pipe that have been developed at the head of the spring. There is also an old roadbed and hiking trails on the slope above the fire road as well as scattered fencing and piping. However, the area remains very wet, and there is currently no obvious impact on the population.

Wildlife is also known to affect this plant as flower heads are often removed from the plants even in remote sites.

Conservation and Management Considerations

The Angeles National Forest has developed a species management guide for this plant (Mistretta and Parra-Szijj 1991), and the Cleveland National Forest includes *Lilium parryi* in their habitat management guide for riparian montane meadows (Winter 1991). *Lilium parryi* is also included in the The San Bernardino National Forest Meadow Habitat Management Guide (USDA Forest Service 2002).

Management objectives for *Lilium parryi* (Mistretta and Parra-Szijj 1991) include:

- Conducting a species monitoring program and site-specific analysis of population localities (conducted in 2000).
- Implementing management guidelines to reduce or eliminate management conflicts and protect habitats against incompatible public use activities.
- Pursuing investigations into species biology and cultivation in order to attempt scientifically tenable species reintroduction or population enhancement.

The following is a list of conservation practices that should be considered for *Lilium parryi*:

- Continue implementation of strategies to protect habitat in species and habitat management guides for *Lilium parryi* and meadow habitat, and Riparian Conservation Area Guidelines.
- Survey all new occurrences of *Lilium parryi* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Lilium parryi* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Lilium parryi* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Lilium parryi is a showy rare species found in high elevation meadow and riparian areas which are susceptible to severe damage by trampling or vehicles. Because of its showy nature, *Lilium parryi* is often targeted by forest visitors picking flowers. Deer or some other wildlife often break off the flower heads as well. However, the distribution of this species is relatively well known, and effective conservation measures are in place for the protection of meadow and riparian habitat. This taxon often grows among willows and may be difficult to spot if showy flowers are not present so it may be more abundant than documented to date.

Based on the above analysis, *Lilium parryi* is currently assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Lilium parryi is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Lilium parryi* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Lilium parryi* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Lilium humboldtii ssp.
ocellatum**

**Limnanthes gracilis ssp.
parishii**

Limnanthes gracilis ssp. parishii

Limnanthes gracilis T. J. Howell var. *parishii* (Jeps.) C. Mason (Parish's meadowfoam)

Management Status

Federal: Forest Service Sensitive

California: Endangered (California Natural Diversity Database)

Heritage Rank: G3T2, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Limnanthes gracilis var. *parishii*, Parish's meadowfoam is endemic to the Peninsular Ranges of Riverside and San Diego counties (California Native Plant Society 2001, Ornduff 1993). There are 27 recorded occurrences; the largest is in Cuyamaca Valley near Cuyamaca Lake and Little Stonewall Creek (California Natural Diversity Database 2004). One population, encompassing about 5 acres (2 hectares), occurs in vernal pools on the Santa Rosa Plateau in southwestern Riverside County (Stephenson and Calcarone 1999).

Distribution in the Planning Area

Within National Forest System lands, *Limnanthes gracilis* var. *parishii* occurs on the Cleveland National Forest. Populations are known from the Descanso Ranger District within or adjacent to the Laguna Mountain Recreation Area and on the Palomar Ranger District in Mendenhall Valley.

Taxonomy and Natural History

Limnanthes gracilis var. *parishii* is an annual with stems less than 30 cm. Leaves are less than 8 cm long, with fewer than 9 leaflets per leaf, each less than 15 mm. Leaflets are linear to ovate and entire to 3-lobed. Flowers are cup-shaped with 8-19 mm white petals. The petal bases are sometimes cream-colored, aging to pink. Petal tips are recurved. Sepals are 3-6 mm. Stamens are 2.5-3.5 mm, anthers more or less 1 mm and are styles 2-3 mm. Fruits are nutlets, 3 mm, obovoid, with short, wide tubercles (Ornduff 1993). Plants flower from April to June (California Native Plant Society 2001).

Limnanthes gracilis var. *parishii* is one of two subspecies of *L. gracilis*, but only variety *parishii* occurs in California. This taxon is the only representative of the genus *Limnanthes* in southern California. It is distinguished from similar congeners by floral characters (Ornduff 1993).

Habitat Description

Limnanthes gracilis var. *parishii* occurs in vernal moist areas and temporary seeps in montane meadows at elevations of 1,970-6,500 feet (600-2,000 meters) (USDA Forest Service 1991, California Native Plant Society 2001). It appears to prefer growing with annuals and herbaceous perennials rather than grasses or shrubs (Bauder 1992, Reiser 1994). It is commonly associated with California buttercup (*Ranunculus californicus*), which is considered a good indicator species for potential meadowfoam habitat (Sproul and Beauchamp 1979). Studies on the species in the Cuyamaca Lake area found that populations occur fairly consistently in the same areas from year to year, unlike annuals associated with greater levels of habitat inundation (Bauder 1992).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 26 presumed extant occurrences for *Limnanthes gracilis* var. *parishii* and one presumed extirpated location (California Natural Diversity Database 2004). The majority of the occurrences are on publicly owned lands, with only three of the CNDDDB occurrences on private lands. There are 11 CNDDDB occurrences listed from Cuyamaca Rancho State Park and one from The Nature Conservancy Santa Rosa Plateau Reserve. Millions of plants were observed in 1992 at the shorelines of Lake Cuyamaca (California Natural Diversity Database 2004).

On the Cleveland National Forest the CNDDDB list 10 occurrences and one planted population. The Cleveland National Forest has 22 occurrence records for *Limnanthes gracilis* var. *parishii*, several of which overlap with the CNDDDB records. Populations appear stable on the Cleveland National Forest, with population numbers ranging between 20 to over 1000 individuals per occurrence.

OCCURRENCE DATA of *Limnanthes gracilis* var. *parishii* (Parish's meadowfoam) on National Forest lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County

1	U	3,000 in 2000	1992	LAKE CUYAMACA; ALONG SHORELINE, ADJACENT DRAINAGES AND MEADOWS, CUYAMACA MOUNTAINS. NUMEROUS COLONIES IN IMMEDIATE VICINITY OF LAKE. FROM VICINITY OF DAM SOUTH PAST CAMP HUAL-CU-CUISH, EAST TO STONEWALL CREEK, NORTHEAST TO THE SUNRISE HIGHWAY, NORTH TO JUNCTION WITH HIGHWAY 79, AND SW	SD
2	U	U	1978	EAST OF LAKE CUYAMACA ALONG ROAD INTO ORIFLAMME CYN OFF COUNTY HWY S-1 NEAR PEDRO FAGES MARKER, LAGUNA MOUNTAINS. REPORTED BY SPOLSKY WITHIN SECTION 35. MAPPED ABOUT 1.6 MILES ESE OF JUNCTION OF HIGHWAY 79 AND COUNTY HWY S-1 (SUNRISE HIGHWAY).	SD
6	U	U	1979	PINE HILL GUARD STATION, T13S/R03E/S26/CNF	SD
7	U	U	U	CANEBRAKE CANYON 1.5 AIR MILES NORTHEAST OF THE NORTH END OF LAKE CUYAMACA, CUYAMACA MOUNTAINS, T13S/R04E/S26	SD
8 ?	2-21	20	1991	Laguna Campground / CNF	SD

8 ?	2-1	U	1988	S. Of Sunrise Hwy / CNF	SD
8 ?	2-4	1000+	1981	Laguna Campground / CNF	SD
9	*	U	U	Laguna Recreation Area / CNF (Planted)	SD
12	U	U	1982	SOUTH OF FERN FLAT, ALONG DRAINAGE ABOUT 0.9 MILE SOUTHWEST OF STATE PARK HEADQUARTERS, CUYAMACA RANCHO STATE PARK. TWO COLONIES MAPPED ALONG TRIBUTARY TO COLD STREAM, ABOUT 0.4 MI AND 0.6 MI UPSTREAM FROM HIGHWAY 79 WHERE IT CROSSES TRIBUTARY.	SD
17	U	U	1987	NEAR CUYAMACA DAM, ALONG NORTH SIDE OF HIGHWAY 79 JUST EAST OF ENGINEERS ROAD, CUYAMACA MOUNTAINS. MAPPED ABOUT 200 METERS EAST OF ENGINEERS ROAD.	SD
19	U	U	1978	SOUTHEAST OF LAKE CUYAMACA IN CANYON EAST OF SUNRISE HWY, ABOUT 3 MI SOUTH OF JUNCTION WITH HWY 79, LAGUNA MOUNTAINS. REPORTED BY SPOLSKY WITHIN SECTION 1. SITE TENATIVELY REFERRED TO AS "HEUCHERA GORGE"; SOUTHWEST TRIBUTARY OF	SD

				ORIFLAMME CANYON.	
20	U	U	1978	SOUTHEAST OF LAKE CUYAMACA ALONG WEST SIDE OF SUNRISE HIGHWAY NORTH OF ENTRANCE TO LUCKY 5 RANCH, LAGUNA MOUNTAINS. MAPPED ABOUT 0.25 MILE NORTHWEST OF ENTRANCE TO LUCKY 5 RANCH AT UPPER END OF "HEUCHERA GORGE". REPORTED BY MCNEILL WITHIN THE NE 1/4 SECTION 12.	SD
22	*	U	1927	Laguna Mountain / CNF	SD
23	2-5	1000+	1981	ALONG MARGIN OF MEADOW, S HALF OF MENDENHALL VALLEY, S OF PALOMAR MTN.	SD
24	U	U	1983	ABOUT 0.25 MI SOUTHWEST OF PASO PICACHO CAMPGROUND, NORTH OF FERN FLAT, CUYAMCA RANCHO STATE PARK. SINGLE COLONY MAPPED JUST NORTH OF LOOKOUT ROAD ON EAST SIDE OF JUNCTION BETWEEN TRAIL TO PASO PICACHO CAMPGROUND AND TRAIL TO AZALEA SPRING FIRE ROAD.	SD

25	U	U	1983	AZALEA SPRING, ABOUT 1 MILE NNE OF CUYAMACA PEAK, CUYAMACA RANCHO STATE PARK. SINGLE COLONY MAPPED JUST NE OF JUNCTION OF AZALEA SPRING FIRE ROAD AND TRAIL TO PASO PICACHO CAMPGROUND; ABOUT 200 M ENE OF SPRING.	SD
26	U	U	1983	LA PUERTA SPRINGS, BETWEEN MIDDLE PEAK AND CUYAMACA PEAK, CUYAMACA RANCHO STATE PARK. SEVERAL COLONIES MAPPED ALONG EITHER SIDE OF MILK RANCH ROAD FROM JUNCTION WITH AZALEA SPRING FIRE ROAD WESTWARD ABOUT 0.4 MILE.	SD
16	U	U	1983	WEST MESA, 0.15 MILE NORTHWEST OF JAPACHA SPRING, CUYAMACA RANCHO STATE PARK. SINGLE COLONY MAPPED ALONG DRAINAGE JUST NW OF WEST MESA LOOP FIRE ROAD.	SD

28	U	U	1983	JAPACHA CREEK, 0.25 MILE SSE OF JAPACHA SPRING, CUYAMACA RANCHO STATE PARK. SINGLE COLONY MAPPED ALONG CREEK AT SW END OF ARROWMAKERS RIDGE AND ABOUT 0.45 MILE UPSTREAM FROM WHERE HWY 79 CROSSES JAPACHA CREEK.	SD
29	U	U	1983	ALONG HARPER CREEK, FROM SWEETWATER CREEK UPSTREAM ABOUT 2 MILES, CUYAMACA RANCHO STATE PARK. NUMEROUS COLONIES MAPPED ALONG MAIN STEM OF CREEK AND SIDE DRAINAGES.	SD
30	U	U	1983	UPPER HARPER CREEK JUST SOUTH OF RATTLESNAKE VALLEY, CUYAMACA RANCHO STATE PARK. THREE COLONIES MAPPED ALONG CREEK ABOUT 0.6-0.9 MILE SSW OF BUILDINGS AT LUCKY 5 RANCH.	SD

31	U	U	1983	MOUTH OF STONEWALL CREEK AT NORTH END OF GREEN VALLEY, CUYAMACA RANCHO STATE PARK. SINGLE COLONY MAPPED ALONG CREEK ABOUT 0.1 MILE UPSTREAM FROM WHERE IT CROSSES ROAD IN GREEN VALLEY.	SD
32	U	U	1987	MESA DE COLORADO, 0.25 TO 0.5 MI E OF POOL C-2 (LARGEST VERNAL POOL). MAPPED AS FOUR COLONIES.	RIV
33	2-16	50+ in 1990	1990	SOUTHEAST OF RATTLESNAKE VALLEY ALONG TRIBUTARY TO HARPER CREEK, ABOUT 0.9 MI SE OF LUCKY 5 RANCH, LAGUNA MOUNTAINS. SINGLE COLONY ALONG CREEK ABOUT 0.7 MILE NE OF DEER PARK ROAD (14S04) AT JUNCTION WITH INDIAN POTRERO ROAD (14S02). / CNF	SD
34	U	1 in 1989, 100's in 1990	1991	PINE VALLEY CREEK, ABOUT 1.8 MILES SOUTHWEST OF DEER PARK, LAGUNA MOUNTAINS. SEVERAL COLONIES MAPPED ALONG PINE CREEK ROAD WITHIN SECTION 12.	SD
34	2-7	300	1989	Pine Valley Creek / CNF	SD

35	U	1000+ in 1990	1991	SOUTHWEST OF PINE MOUNTAIN, ALONG DRAINAGE ABOUT 0.5 MILE SOUTH OF INDIAN POTRERO, LAGUNA MOUNTAINS. WEST-FACING INTERMITTANT DRAINAGE MAPPED NEAR CENTER OF LINE BETWEEN SECTIONS 31 AND 32.	SD
35	2-15	1000+	1990	Pine Mountain / CNF	SD
36	U	340+ in 1990, 60 in 1989	1991	INDIAN CREEK, SOUTH OF PINE MOUNTAIN, LAGUNA MOUNTAINS. SEVERAL COLONIES MAPPED ALONG INDIAN CREEK ABOUT 1 TO 1.5 MILES SOUTH OF PINE MOUNTAIN, AND ALONG TRIBUTARY ON SOUTH SIDE OF PINE MOUNTAIN. MAPPED AS SIX POLYGONS.	SD
36	2-6	200	1989	Indian Creek / CNF	SD
36	2-10	25	1990	Indian Creek / CNF	SD
36	2-11	200	1990	Indian Creek / CNF	SD
36	2-12	1	1990	Indian Creek / CNF	SD
36	2-13	100	1990	Indian Creek / CNF	SD
36	2-14	20	1990	Indian Creek / CNF	SD

37	U	1000 in 1990, 500 in 1992	1992	FILAREE FLAT EAST; NORTHEAST END OF FILAREE FLAT ALONG SUNRISE HIGHWAY, LAGUNA MOUNTAINS. TWO COLONIES: ONE LOCATED JUST SOUTH OF THE GARNET INFORMATION CENTER ALONG THE SW SIDE OF THE HIGHWAY; THE OTHER JUST EAST OF THIS, ON EAST SIDE OF HIGHWAY. MAPPED WITHIN THE SW 1/4 SE 1/4 SECTION 28 AND THE NW 1/4 NE 1/4 SECTION 33.	SD
37	2-9	1000	1990	Filaree Flat / CNF	SD
38	U	1500 in 1990, 1000 in 1991	2004	FILAREE FLAT WEST; SOUTHWEST END OF FILAREE FLAT ALONG LUCAS CREEK, LAGUNA MOUNTAINS. MAPPED AS THREE POLYGONS NEAR THE CENTER OF THE E 1/2 SECTION 33.	SD
38	2-8	1506	1990	Filaree Flat / CNF	SD
39	U	U	U	BANKS OF ORINOCO CREEK JUST WEST OF EAGLE PEAK ROAD. EXACT LOCATION UNKNOWN. MAPPED IN VICINITY OF ORINOCO CREEK.	SD

40	U	U	U	POND NORTHEAST OF HARRISON PARK EAST OF HIGHWAY 79. EXACT LOCATION UNKNOWN. MAPPED IN VICINITY OF HARRISON PARK.	SD
*	2-17	1000	1991	Filaree Flat / CNF	SD
*	2-18	U	1993	Filaree Flat / CNF	SD
*	2-19	500	1992	Filaree Flat / CNF	SD

- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *CNF = Cleveland National Forest*
- *SD = San Diego County*
- *RIV = Riverside County*

Threats

Gullyng, trailing, and pumping from wells can lower the water table and alter the hydrology of the taxon's wet meadow habitat (USDA Forest Service 1991). Alteration of meadow hydrology may affect the plant's reproductive ecology, as the seeds appear to require saturated soil to germinate and become established (Bauder 1992). Some *Limnanthes gracilis* var. *parishii* populations are threatened by grazing, trampling, vehicular activity, and recreational development (California Native Plant Society 2001). Occurrences within Cuyamca State Park and adjoining lands (including some NFS lands along Indian Creek) most likely burned in the 2003 Cedar Fire. Habitat effects of the fire and any subsequent post fire flooding are not known at this time.

On the Cleveland National Forest, populations in the Laguna and Palomar Mountains are subjected to grazing pressures and some trampling by hikers. Grazing may remove flower stems, reduce plant photosynthetic capacity, and cause soil compaction, which may alter site hydrology. Trampling directly damages plants and also compacts soil, increasing runoff. Compacted areas may not retain enough moisture at the proper time of year to stimulate seed germination. Plants are also present on lands in the Laguna Recreation Area under special use permit. Measures have been implemented at several locations to reduce these effects.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Limnanthes gracilis* var. *parishii* (USDA Forest Service 1998a):

- Implement strategies in the "Habitat management guide for the sensitive plant species: *Delphinium hesperium* Gray ssp. *cuyamaca* (Abrams) Lewis & Epling, *Lilium parryi* Wats., *Limnanthes gracilis* Howell var. *parishii* (Jeps.) C. Mason, *Poa atropurpurea* Scribn. in riparian montane meadows." (USDA Forest Service 1998a).
- Maintain viable populations at all known locations of Regional Forester's Sensitive plant list species in montane meadows. Since many of the known occurrences of meadow-dependent sensitive plant species are on private land, protection of the viability of all populations on Federal land is essential for the recovery of these species.
- Conserve meadow habitat and prevent fragmentation of montane meadows. Protect sensitive plant populations that are negatively affected by grazing or recreational activity. This may be accomplished through land acquisition, relocation of planned and existing facilities and improvements, changes in grazing season, and/or installation of fences and barricades.
- Conserve meadow water tables, and prevent accelerated erosion by employing Best Management Practices and specific mitigation measures for the stabilization of streambanks.
- Employ other mitigation measures such as elimination of non-essential roads and trails and maintenance of vegetative cover.
- Locate new campgrounds and other developments outside the montane meadows.
- Assure that trails and roads that cross meadows comply with riparian standards and guidelines. Permit mountain bikes only on designated trails.
- Permit driving on meadows for administrative and special uses only when the meadow is dry. Driving shall occur only when absolutely necessary to maintain facilities such as power lines and wells; routes to be used by special use permittees shall be specified in their permit. Avoid driving on meadows for routine administrative activities such as law enforcement patrol, resource inventory, or vegetation management work.
- Do not use montane meadows as fire fighting staging areas, parking areas, for constructed helipads, or for fire camps. Fire lines shall not be constructed in montane meadows. Review existing fire plans to ensure that montane meadows are not planned for use as fire camps.
- Further protection for this habitat was instituted from a Memorandum of Understanding (MOU) between the U.S. Fish and Wildlife Service, Helix Water District, Lake Cuyamaca Recreation and Park District, the California Department of Parks and Recreation, and the U.S. Forest Service, which called for signatory land managers to preserve and protect the endangered species and the habitat they depend upon (Helix Water District 1996). Consider updating the MOU, as this agreement expired in 1999.

Evaluation of Current Situation and Threats on National Forest System Lands

Limnanthes gracilis var. *parishii* has a restricted distribution on the Cleveland National Forest. Populations occur in wet meadow areas that are subject to grazing or recreation activities, which can have potential negative impacts on plant populations by damaging plants and preventing seed production. At present most occurrences of this taxon are at least partially protected by signing and/or

fencing and appear to be stable.

The Cleveland National Forest has written a habitat management guide for riparian montane meadows that includes this taxon (USDA Forest Service 1991). Some grazing exclosures and bank stabilization measures have been implemented for populations of this species on the Palomar Ranger District. Also, monitoring plans have been incorporated on the Palomar and Descanso Ranger Districts to determine impacts of recreational activities and grazing on *Limnanthes gracilis* var. *parishii* survival and expansion into suitable habitat. Locations under special use permit have been identified to permittees to prevent effects to these occurrences. Three campsites within occupied habitat were decommissioned and allowed to recover naturally in Laguna Campground in the 1990's. Exclosures have been effective for continued viability of Parish's meadowfoam both at Laguna Campground and Mendenhall Valley. In addition, plants appear to be stable and are reproducing in abundance both inside and outside the exclosure at Mendenhall Valley. However, future increases in recreation pressure, particularly in the Laguna Meadows area, could result in greater impacts to *Limnanthes gracilis* var. *parishii*. Implementation of all meadow management recommendations would greatly reduce the risks to this taxon.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	A

Limnanthes gracilis var. *parishii* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat will undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The habitat management guide for *Limnanthes gracilis* var. *parishii* would continue to be implemented under all alternatives. In addition, because this taxon co-occurs in many locations with *Horkelia clevelandii*, the host plant for the endangered Laguna Mountains skipper butterfly, *Limnanthes gracilis* var. *parishii* would benefit across alternatives 2-6 from the CNF Standard S10, that states: " Avoid or mitigate activities resulting in direct trampling or erosion problems to Laguna Mountains skipper occupied habitat and adjacent areas."

Under Alternative 1, the Laguna Mountain populations would be managed within the Back Country Non-Motorized land use zone. The Mendenhall Valley populations would be managed within the Back Country land use zone. Under this alternative, the current management for this taxon would be retained. Southern California Conservation Strategy actions to benefit Laguna skipper butterfly would be beneficial to *Limnanthes gracilis* ssp. *parishii* where occurrences overlap.

Under Alternative 2, both the Laguna Mountain and Mendenhall Valley populations would be managed within the Back Country Non-Motorized land use zone. In this alternative, there is a higher level of investment in avoidance and minimization of effects to species-at-risk but provides little focus on the restoration of habitats. More intensive user controls would be designed to minimize user conflicts with sensitive environmental resources.

Under Alternative 3, Laguna Mountain populations would retain Back Country Non-Motorized zoning, and Mendenhall Valley would become a combination of Back Country Motorized and Back Country zoning. In this alternative, there is a higher level of investment in maximum visitor capacity controls and modification of existing facilities including a decommissioning of recreation facilities and individual sites that are affecting sensitive resources.

Under Alternative 4, both the Laguna Mountain and Mendenhall Valley populations would be managed within the Back Country Non-Motorized land use zone. This alternative would provide the most emphasis on all types of recreation. In this alternative, there is a higher level of focus on management of recreation growth including monitoring recreation use and its effects and managing use in order to offset effects of uses on other resources such as wildlife and vegetation, emphasizing enforcement, and public education programs. The emphasis on management of developed sites may benefit *Limnanthes gracilis* ssp. *parishii* in those locations versus those in Alternative 4a.

Under Alternative 4a, the Laguna Mountain populations would be managed within a Back Country Non-Motorized zone. The Mendenhall Valley occurrences would be managed within Developed Area Interface and Back Country Non-Motorized zones. In this alternative as in alternative 4, there is a higher level of focus on management of recreation growth including monitoring recreation use and its effects and managing use in order to offset effects of uses on other resources such as wildlife and vegetation, emphasizing enforcement, and public education programs. The difference between alternative 4 and alternative 4a is that 4a would not accommodate as much of the projected recreation demand as in Alternative 4. Management of dispersed uses would receive higher management emphasis in Alternative 4a also. Occurrences affected by dispersed use may benefit in this alternative versus that of Alternative 4.

Under Alternative 5, the Laguna Meadow and Mendenhall Valley areas would be managed as a Back Country Motorized land use zone. Under this alternative, some of the Laguna populations would change from non-motorized management to motorized. Alternative 5 is designed to fully accommodate the projected demand for motorized recreation use which could result in development of motorized trails adjacent to meadow habitat that contain *Limnanthes gracilis* var. *parishii*. Although trails would

undoubtedly be designed to avoid effects to known occurrences, the presence of motorized use creates the possibility of unauthorized off-route travel, which could affect this plant and contribute to decline in populations. The increased emphasis on commodity production and motorized recreation in Alternative 5 may increase the chance that unprotected populations could be affected by increased grazing pressure or additional water withdrawals.

Under Alternative 6, most of the Laguna Meadow area and National Forest System lands in Mendenhall Valley would be managed as a Critical Biological land use zone for *Limnanthes gracilis* var. *parishii* and the Laguna Mountains skipper butterfly. Management under a Critical Biological zone would increase protective measures and most likely curtail grazing; if detrimental effects from recreational use occur, those activities would be eliminated as well. The higher level of emphasis in Alternative 6 on low impact recreation, visitor capacity controls, public education and habitat restoration would also benefit this taxon.

On NFS lands, this taxon is mostly affected by cattle grazing and recreation use; however most occurrences have been fenced, barricaded or in some locations season of grazing delayed to protect habitat. The projected increase in commodity production and motorized use in Alternative 5 and projected effects to habitat from road and trail construction, maintenance and use result in the lower outcome rating for this alternative. The Filaree Flat Special Interest Area recommendations were also taken into consideration when predicting outcomes.

Viability Outcome for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	B	B

Limnanthes gracilis var. *parishii* is distributed in a limited number of occurrences in California and is in danger of extirpation in a portion of its range (California Native Plant Society 2001). The major threats are habitat loss and excessive disturbance (USDA Forest Service 1998b). Large populations were assumed lost with the establishment of Cuyamaca Dam (Dudek and Associates 2000). However, over 70% of the known occurrences are found on land owned or managed by the Helix Water District, Lake Cuyamaca Recreation and Park District, California Department of Fish and Game, and the USDA Forest Service. These parties entered into a habitat conservation agreement to protect the taxon (Helix Water District et al. 1996), however this agreement formally expired in August 1999.

Less than half of the known occurrences of this taxon are found on National Forest System land, meaning that variations in population size due to Forest Service activities will not have a substantial effect on the overall fate of *Limnanthes gracilis* var. *parishii*. Impacts to occurrences of *Limnanthes*

gracilis var. *parishii* on National Forest System lands have been reduced within the last ten years, as some occurrences have had recreational activities removed and habitat has recovered. Current management across the range of the species is expected to continue for most occurrences of this plant. By maintaining the current distribution of *Limnanthes gracilis* var. *parishii* on National Forest system lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause the species to suffer a decline in its overall distribution.

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Lilium parryi

Linanthus concinnus

Linanthus concinnus

Linanthus concinnus Milliken (San Gabriel linanthus)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2? (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Linanthus concinnus is endemic to the San Gabriel Mountains in Los Angeles and San Bernardino Counties. The known range of *Linanthus concinnus* is approximately 30 miles wide and 15 miles long, limited to the San Gabriel Mountains, from Mount Lowe east to Timber Mountain and as far north as Largo Vista. The type specimen was collected from the eastern edge of the species' range from Lytle Creek Canyon at 6000 feet in 1900 by H. M. Hall and deposited in the UC herbarium as Hall 1443 (USDA Forest Service 2003).

Distribution in the Planning Area

The majority of the occurrences are located on Forest Service lands. All but two occurrences in Health Canyon are located on ANF lands, with a portion of the Timber Mountain occurrence also on adjacent SBNF lands. The rediscovered occurrence at Lytle Creek Canyon is also on the SBNF. The two occurrences in Health Canyon are located on what appears to be private property (USDA Forest Service 2003).

Taxonomy and Natural History

Linanthus concinnus is a dicotyledonous plant in the phlox family (Polemoniaceae). It is distinguished by its wide calyx membranes (Patterson 1993). *Linanthus concinnus* flowers from April–July (California Native Plant Society 2001).

Linanthus concinnus is an annual plant that is glandular-hairy. The stem is 1-12 cm. Leaves are opposite or more or less alternate with 8-15 mm lobes that are linear and generally connected at the base. The leaves appear pinnately lobed. The inflorescence is crowded with 3-7 flowers. The calyx is 10 mm and the membrane is wider than the ribs. The corolla is funnel-shaped, white, and has a 1-2 mm tube, 6-8 mm throat, and 5-10 mm lobes that are widely lanceolate, entire or toothed at the tips with 2 dark purple marks at the base. The stamens are included (Patterson 1993).

Habitat Description

Based on data gathered at known localities in the 2003 surveys and historical information as described in the 2003 report, the habitat this species prefers is typically in sunny opening of mixed chaparral to mixed conifer forest between 5000 feet and 8500 feet (1520m and 2590 m) elevation, from canyon live oak-interior live oak chaparral to sugar pine-jeffrey pine-white fir forest. Plants are found occasionally on shallow slopes of ridgetops to more commonly on steep to moderate, loose rocky slopes; generally on south-facing to west- and east-facing slopes. Plants are most commonly associated with Mesozoic granitic rocks of tonalite and diorite, granite and adamellite, or granodiorite; occasionally on pre-Cretaceous metamorphic of pelona schist or mylonite; and rarely on pre-Cretaceous metasedimentary rocks. Plants are found most commonly on soils of rock outcrop-Lithic Xerorthents-Rubble land association; occasionally on soils of Typic Xerorthents-Haploxerolls-Typic Xerchrepts complex, or Waterman-Springdale-Pacifico families complex; and more rarely on soils of Stukel-Sur-Winthrop families complex, Xerorthents-Green Bluff family-Rock outcrop complex, or Bakeoven-Sur families complex.

Other plants commonly associated with *Linanthus concinnus* are *Allium monticola*, *Arctostaphylos patula*, *Chaenactis santolinoides*, *Chrysothamnus* spp. *Elymus elymoides*, *Epilobium canum*, *Erigeron foliosus*, *Erigonum* cf. *nudum*, *E. saxatile*, *E. wrightii* var. *subscaposum*, *Eriogonum confertiflorum*, *Galium angustifolium*, *Penstemon grinnellii*, *Phacelia austromontana*, *Pinus jeffreyi*, *Poa secunda*, *Quercus chrysolepis*, and *Yucca whipplei* (USDA Forest Service 2003). Other species reported in association with *Linanthus concinnus* include *Linanthus breviculus*, *Eriogonum fasciculatum*, *Arabis perennis*, *Lupinus excubitus*, *Hulsea vestita* ssp. *gabrielensis*, *Caulanthus amplexicaulus*, and *Tauschia parishii*, (California Natural Diversity Database 2002).

Occurrence Status

The California Natural Diversity Database (2004) lists fifteen occurrences. At seven of these occurrences *Linanthus concinnus* had not been documented for more than 70 years, and the only information is from historical collections (California Natural Diversity Database 2004).

Surveys in 1991 were not successful in relocating historic populations (USDA Forest Service 2002). Plants were counted in 1994 at six occurrences on the Angeles National Forest and San Bernardino National Forest; occurrence size ranged from 30 to 700 plants, and 0 plants were found at one known site (California Natural Diversity Database 2004).

In 2003, the Angeles and San Bernardino National Forest contracted botanical surveys with Rancho Santa Ana Botanic Garden for the relocation of historical occurrences. Detailed location, abundance, habitat and threat information was compiled in an unpublished document submitted to the ANF and SBNF regarding these surveys (USDA Forest Service 2003). The majority of the information included in this assessment is taken directly from that document. Seeds and voucher specimens were collected and photos were also taken. The 2003 surveys were conducted during an optimal year for *Linanthus concinnus* and revealed large numbers of this annual species that may not be witnessed in subsequent years, depending on annual rainfall fluctuations in the populations and climate.

A total of fourteen historical and/or previously reported occurrences of *Linanthus concinnus* along Mount Markham, Pacifico Mountain, Mount Hillyer, Waterman Mountain, Little Rock Creek, Mount Williamson Trail, south fork Big Rock Creek Trail, Dawson Saddle, Health Canyon, Mount Baldy Notch, Mount Baldy Trail, and Timber Mountain were relocated and verified. Four additional previously unreported occurrences in Cooper Canyon and Icehouse Canyon were also discovered.

Historical localities surveyed in 2003 with negative results in 2003 that warrant additional surveys include: slopes above Vincent Gulch, along Mt. Baldy Trail, near Largo Vista along Grandview Canyon and along Mount Hillyer Trail.

Historical localities that were not surveyed in 2003 due to time constraints or lack of precise locality information include: Lytle Creek Canyon, north Fork of San Antonio Creek, Swarthout Canyon, and along Big Rock Creek along the Manzanita Trail (USDA Forest Service 2003).

Lytle Creek Canyon was surveyed in 2004 by staff of Rancho Santa Ana Botanic Garden and the presumptive type locality was rediscovered. 197 individuals were recorded from this locality co-occurring with the rare *Orobanche valida* (Fraga, 2004).

The following table shows the number of occurrences recorded in the literature prior to the 2003 surveys, the number of plants reported to be present, and the general location of these occurrences. For updated status of these occurrences, see 2003 survey document for *Linanthus concinnus* (USDA Forest Service 2003).

OCCURRENCE DATA – *Linanthus concinnus* (San Gabriel linanthus)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1917	Icehouse Canyon, San Antonio Hills, San Gabriel Mountains. SBNF.	SBD

2	'fairly abundant in scree'	1987	Baldy Notch near ski area, San Gabriel Mountains. Threats: foot traffic, development of ski area. SBNF.	SBD
3	U	1920, 1924	Devils Backbone Ridge, eastern San Gabriel Mountains. Ridge between Lytle Creek and San Antonio Canyon. SBNF.	SBD
4	U	1986	Road between Alder Saddle and Pacifico Mountain, San Gabriel Mountains. Rocky roadside in open chaparral on weathered granite soils. Along unpaved road NW of Hwy. 2. Land ownership: ANF.	LA
5	U	1927, 1931	Trail to summit of Mount San Antonio (Mt. Baldy), San Gabriel Mountains. On granite and gneiss talus. Several collections from vicinity. ANF, SBNF.	LA, SBD
6	'occasional' on warm, dry slopes	1923	Vincent Gulch, San Gabriel Mountains. Occasional on warm, dry slopes. ANF.	SBD

7	250	1994	S side of Swarthout Valley on ridge between Heath Canyon and Acorn Canyon, San Gabriel Mountains. Growing on Peloma Schist, rocky substrate of 2-4 cm. clasts. Mapped on S-facing slope just SE of the 6747' elevation marker on the ridge. Assoc. with <i>Linanthus breviculus</i> , <i>Yucca whipplei</i> , <i>Eriogonum fasciculatum</i> , and <i>Arabis perennans</i> . Land ownership: U	SBD
8	1	1994	S side of Swarthout Valley on N-facing slope of Heath Canyon, San Gabriel Mtns. In open rocky area in Jeffrey Pine forest/canyon oak. Assoc. with <i>Lupinus excubitus</i> . Soils derived from metasedimentary rock (limestone/sandstone marble/quartzite). Mapped about 250m NNW of 6701' elevation marker. PVT.	SBD
9	50 plants scattered in clumps over about 500' of trail.	1994	0.7 mi. S of Mt. Williamson along trail between Kratka Ridge and Islip Saddle, San Gabriel Mtns. Dry Rocky openings in Jeffrey Pine Forest/Canyon oak. Assoc. with <i>Hulsea vestita gabrielensis</i> , <i>Tauschia parishii</i> , and <i>Eriogonum nudum</i> . Growing on E-facing slope on granitic rock/soils. ANF.	LA

10	30 plants scattered in clumps on both sides of trail for about 150 yards	1994	0.9 mi. SSE of Mt. Williamson along trail between Islip Saddle and Reed Spring, San Gabriel Mountains. Dry rocky openings in Jeffrey Pine/canyon oak forest. Assoc. with <i>Hulsea vestita gabrielensis</i> , <i>Caulanthus amplexicaulis</i> , <i>Tauschia parishii</i> , and <i>Eriogonum nudum</i> . On SE-facing slope on granite rock. Site is just NNW of the junction of Hwy. 2 and Hwy. 39. ANF.	LA
11	ca. 700 plants in a 120' x 60' area	1994	0.45 mi. SE of Mt. Lewis along Hwy just E of Dawson Saddle, San Gabriel Mtns. Along S-side of bend of Hwy. 2 at Dawson Saddle. Dry rocky openings in Jeffrey pine forest. Assoc. w/ <i>Phacelia austromontana</i> , <i>Chaenactis santolinoides</i> , <i>Eriogonum saxatile</i> , <i>Caulanthus aplexicaulis</i> , and <i>Linanthus breviculus</i> . Gneiss rock type. ANF.	LA
12	U	1906, 1928, 1934	S Fork Rock Creek (Big Rock Creek), San Gabriel Mtns. Open, thinly forested slopes. Forming large masses of pure white (Peirson 1928). Three collections from rock creek, south of Valyermo, Lowell Mine, and San Gabriel Mtns. ANF.	LA

13	U in 1992; 0 in 1994	1992, 1994	Punchbowl Canyon SW of Devils Punchbowl County Park, N slope of San Gabriel Mtns. Open area in Coulter pine forest. Ass. w/ <i>Linanthus breviculus</i> . W-facing slope. SE side of Canyon ca. 500m S of the 5270' elevation marker. ANF.	LA
14	U	1921	Mount Markham, San Gabriel Mtns. 1921 collection by Kessler. ANF.	LA
15	U	191U	Summit of Mt. Lowe, San Gabriel Mtns. Undated collection by Peirson, circa 1910-1920. ANF.	LA
*	197	1900 (Hall, UC) 2004 (Fraga, RSA)	Lytle Creek Canyon, Type Locality. Slopes above the North Fork of Lytle Creek, Eastern San Gabriel Mountains, 6100-6300 ft. SBNF.	SBD

- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

Threats

Threats to *Linanthus concinnus* include road use and maintenance (Cooper Canyon 1 and 2, Angeles Crest Highway, Mount Baldy Notch, Pacifico Mt.), a large number of hiking trails that bisect populations (Dawson Saddle, Heath Canyon 1 and 2, Icehouse Canyon Trail, Chapman Trail, Rattlesnake Trail (PCT), Mount Baldy Trail, Mount Hillyer Trail, Mount Markham 1 and 2, Mount Williamson Trail, South Fork Big Rock Creek Trail, Three Tees Trail and side trails to summit of Timber Mt from main trail, and Waterman Mountain Trail), trail maintenance, presence of invasive non-

native grass *Bromus tectorum* (Icehouse Canyon Trail), Mount Baldy Ski area activities and trash on slopes (Mount Baldy Notch), mountain bikes and equestrian use along trails where plants occur (USDA Forest Service 2003). The October 2003 Grand Prix Fire did not burn the type locality in Lytle Creek or the Telegraph Peak locations, however there is a slight chance that other locations may have burned or been affected by fire suppression activities in the 2003 fires. Fire itself may not have negatively affected the plants or habitat however suppression activities may pose long term effects from soil disturbance and weed encroachment. Monitoring is needed. Future ski area development may have potential to affect habitat on the Angeles National Forest occurrences within the Mt. Baldy Ski Area (California Natural Diversity Database 2002).

Conservation and Management Considerations

The following list of conservation practices should be considered for *Linanthus concinnus*:

- Continue surveys in potential habitat for *Linanthus concinnus* as described in the 2003 survey document. Survey locations that may have been burned, or been affected by suppression activities in the 2003 Grand Prix, Old and Lytle Fires. Document post fire and suppression rehabilitation effects.
- Continue seed banking effort begun by RSABG in 2003, if large numbers of plants are present.
- Develop Species Management Guide for *Linanthus concinnus* for the ANF and SBNF.
- Collect a herbarium voucher specimen of *Linanthus concinnus* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Linanthus concinnus* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Roads affect populations in five locations, trails affect populations in fifteen locations. The Mt Baldy Ski area affects habitat also. No recorded occurrences are fully protected from identified threats.

Based on the above analysis, *Linanthus concinnus* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	C	A

Linanthus concinnus is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Threats to this species occur almost entirely from use and maintenance of hiking trails (15 occurrences) and to a lesser extent, roads (5 occurrences), where this plant occurs. Habitat is also affected in the Mount Baldy Ski Area. Although Alternative 4 would emphasize increased recreation, monitoring and redirected use is expected to reduce effects from recreational use in sensitive areas. For this reason, Alternative 4 was given a B outcome for this species. Timber Mountain and Icehouse occurrences are within the Existing Cucamonga Wilderness on the Angeles and San Bernardino National Forest and this designation does not vary by alternative. The type locality for this plant was collected in Lytle Creek drainage. In Alternative 1, this drainage is zoned as a combination of Back Country Motorized, Developed Area Interface with the west side of the Creek zoned as Back Country Non-Motorized. Alternatives 2 and 4 are the same as 1 on the east sides but the west side would become wilderness as the Cucamonga B Wilderness expansion acres are designated. Alternative 4a and 6 contain recommended wilderness in habitat for this species on the ANF and SBNF. Lytle Creek Drainage in Alternative 3 would be zoned similar to 2 with additional Back Country Non-Motorized present. In Alternative 5, land use zoning would change the current Back Country Non-Motorized to Back Country that would result in a decrease in habitat protection of *Linanthus concinnus* habitat. Alternative 6 is the same as 2 and 4 with additional areas of Back Country Non-Motorized zoning. Many occurrences on the ANF are located in steep areas that are not readily accessible by vehicles. The only substantial differences for this species on the ANF across alternatives is the management emphasis on conservation, with associated protection and monitoring, impact identification, and response time. In this sense Alternatives 5 is least protective, 1, 2 and 4 provide moderate protection, and 3 and 6 provide most protection.

Consideration of the Suitable Use restricting vehicle travel to designated Forest Transportation System roads and trails, along with the Standards for roads and trail management factor into these outcomes as does completion and implementation of a species management guide for *Linanthus concinnus*.

Viability Outcome for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
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B	B	A	B	B	C	A
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All but two occurrences occur on National Forest System lands on the Angeles and the San Bernardino National Forests. Viability of this species across its range is tied to Forest Service Management. By maintaining the current distribution of *Linanthus concinnus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Linanthus concinnus* to suffer a decline in its overall distribution.

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**Limnanthes gracilis ssp.
parishii**

Linanthus jaegeri

Linanthus jaegeri

Linanthus jaegeri (Munz) J.M. Porter and L. A. Johnson (San Jacinto prickly phlox)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Linanthus jaegeri is endemic to the San Jacinto Mountains of Riverside County. All occurrences are found within the San Bernardino National Forest and the Mount San Jacinto State Park. Locations include Tahquitz Peak, Murray Canyon, Folly Peak, San Jacinto Peak, Cornell Peak, and near the Palm Springs Aerial Tramway Station (CNDDDB 2004).

Distribution in the Planning Area

Five of the fifteen known occurrences of *Linanthus jaegeri* are within the San Jacinto Wilderness area of the San Bernardino National Forest (SBNF). These include Tahquitz Peak, the head of Murray Canyon, and a historical record near Caramba Camp in the northeast corner of the San Jacinto Wilderness south of Mount San Jacinto State Park (CNDDDB 2004).

Taxonomy and Natural History

Linanthus jaegeri is a dicotyledonous perennial herb in the phlox family (*Polemoniaceae*). The plant is caespitose and generally 2-10 cm high. Stems, leaves, and calyx lobes are glandular hairy. Leaves are generally opposite and more or less pinnately 3-lobed; this feature readily distinguishes *Linanthus jaegeri* from the other two *Leptodactylon* species in California, both of which have alternate, palmately-lobed leaves (Patterson & Meyers 1993). Leaves on *Linanthus jaegeri* also have spine-tipped lobes that are 10-15 mm in length. Inflorescences are crowded in the upper axils. There are generally six calyx lobes that are usually unequal. The corolla is white and funnel-shaped, and the combined length of the tube and the throat are 17-30 mm. There are generally six corolla lobes that are each 7-9 mm long and

oblanceolate. There are generally six stamens that are attached at the throat (Patterson & Meyers 1993). Flowering typically occurs between July and August (Munz 1974).

Habitat Description

Linanthus jaegeri inhabits dry, granitic soils in rock crevices in granitic outcrops) in upper montane to subalpine coniferous forest between 8,000-10,000 ft in elevation (California Native Plant Society 2001). The occurrence from near Caramba Camp on the SBNF (CNDDDB occ.# 16) was reported to be on a "limestone" rocky outcrop, although this occurrence has not been recently confirmed.

On the SBNF, subalpine coniferous forest is primarily restricted to the high peaks of the San Jacinto Mountains and the San Bernardino Mountains. Although *Linanthus jaegeri* has not been found in the San Bernardino Mountains, potential habitat exists on San Bernardino Mountain, San Gorgonio Mountain and its surrounding peaks, and the Ten Thousand Foot Ridge in the San Gorgonio Wilderness of the San Bernardino National Forest.

Occurrence Status

There are fifteen occurrences of *Linanthus jaegeri* recorded in the CNDDDB (2004). All occurrences are very small in size, with no more than 30 individuals in the largest recorded occurrence (CNDDDB 2004). It is unknown whether occurrences of *Linanthus jaegeri* are naturally restricted in distribution and abundance, or if other factors have contributed to their narrow range. Trends in abundance and distribution are also unknown.

The following table shows the recorded occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Linanthus jaegeri* (San Jacinto prickly phlox)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
2	< 20	1983	Tahquitz Peak, near Lily Rock, San Jacinto Mountains. SBNF	RIV
3	< 10	1983	Near lookout tower on Tahquitz Peak, San Jacinto Mts. SBNF	RIV

4	< 20	1983	Both sides of Pacific Crest National Scenic Trail 0.35 mi NNE of head of Murray Cyn. SBNF	RIV
5	< 10	1983	Pacific Crest National Scenic Trail at head of Murray Canyon, San Jacinto Mts. SBNF	RIV
6	< 20	1983	East side of Pacific Crest National Scenic Trail, 0.9 miles SE of Castle Rocks. DPR-Mount San Jacinto SP	RIV
7	< 10	1983	0.85 miles west of San Jacinto Peak summit. DPR-Mount San Jacinto SP	RIV
8	< 10	1983	North side of Folly Peak, San Jacinto Mountains. DPR-Mount San Jacinto SP	RIV
9	< 20	1983	Cornell Peak, San Jacinto Mountains. DPR-Mount San Jacinto SP	RIV
10	< 10	1983	0.7 air mi NE of Cornell Peak, San Jacinto Mountains. DPR-Mount San Jacinto SP	RIV
11	< 10	1983	0.7 air mi ESE of campground in Round Valley, San Jacinto Mts. DPR-Mount San Jacinto SP	RIV
12	< 10	1983	0.1 mile north of Hidden Lake, San Jacinto Mountains. DPR-Mount San Jacinto SP	RIV
13	< 30	1983	Near Palm Springs Aerial Tramway Station in Mount San Jacinto State Park. DPR-Mount San Jacinto SP	RIV

14	< 10	1983	0.6 mile NW of Palm Springs Aerial Tramway Station, in Mount San Jacinto State Park. DPR-Mount San Jacinto SP	RIV
15	< 10	1983	0.5 mile NW of Palm Springs Aerial Tramway Station, in Mount San Jacinto State Park. DPR-Mount San Jacinto SP	RIV
16	U	1981	Beyond (E?) Caramba Camp, off FS trail, San Jacinto Mts. SBNF	RIV

- *U* = Unknown
- *SBNF* = San Bernardino National Forest
- *RIV* = Riverside County

Threats

Occurrences within the San Jacinto Wilderness on the SBNF are relatively well protected from most Forest uses. However, hiking and rock climbing may affect *Linanthus jaegeri* occurrences and habitat.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Linanthus jaegeri*:

- Survey all new occurrences of *Linanthus jaegeri* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Conduct surveys in the high peaks of the San Bernardino Mountains south of the Santa Ana River for occurrences of *Linanthus jaegeri*. Identify suitable habitat if the species is not found to occur.
- Collect a herbarium voucher specimen of *Linanthus jaegeri* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Linanthus jaegeri* in the planning area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Linanthus jaegeri is only known from the San Jacinto mountains. The main threats to this species are low intensity recreational climbing and hiking but these are not perceived to be widespread across its known and potential habitat. Some occupied habitat is within the established San Jacinto Wilderness. Although upper montane and subalpine coniferous forest is relatively restricted across the southern California national forests, much of the potential habitat in both the San Jacinto and San Bernardino Mountains is also protected within established Wilderness areas.

Based on this analysis, *Linanthus jaegeri* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Linanthus jaegeri is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Linanthus jaegeri* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for All Lands within Range of Taxon

By maintaining the current distribution of *Linanthus jaegeri* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Linanthus concinnus

Linanthus killipii

Linanthus killipii

Linanthus killipii H. Mason (Baldwin Lake linanthus)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Linanthus killipii is endemic to the San Bernardino Mountains in San Bernardino County. The plant occurs in Holcomb, Lone and Big Bear valleys in the northeastern portion of the mountain range. The greatest density of occurrences is found in the Baldwin Lake area and on Nelson Ridge, but other notable locations include Cactus Flats, Round Valley, Tip Top Mountain, and north of Jacoby Canyon (USDA Forest Service 2002a).

Distribution in the Planning Area

Most of the known occurrences of *Linanthus killipii* are on the San Bernardino National Forest (SBNF) (California Natural Diversity Database 2004). Only six recorded occurrences are on private land, and these occurrences are all in close proximity to the residential communities of Big Bear City, Erwin Lake, Woodlands, and Sugarloaf.

Taxonomy and Natural History

Linanthus killipii is a dicotyledonous annual herb in the phlox family (*Polemoniaceae*). The plant is hairy with a stem that is 5-15 cm long. Leaf lobes are 3-10 mm and linear. Inflorescences are terminal, and flowers are generally sessile. The calyx is 6-7 mm long with a membrane that is wider than the ribs and is extended along the lobes. The corolla is funnel-shaped, with a white tube 4-5 mm long and a yellow throat 3-4 mm long. Corolla lobes are 3-4 mm long and white with a purple mark at the base. Stamens are included (Patterson 1993). Flowering occurs between May and July (Munz 1974).

Habitat Description

Linanthus killipii occurs on pebble plains, alkaline meadows, and dry slopes within pinyon-juniper woodlands, Joshua tree woodlands, and upper montane conifer forests (USDA Forest Service 2002a). It grows between 5,000 and 8,000 feet (1,700 and 2,400 m) (Patterson 1993) on gentle to flat slopes. The highest density of plants on the SBNF is found on granitic and clay soils around Baldwin Lake, although individuals have also been found in sandy soil adjacent to an alkaline meadow north of Baldwin Lake (USDA Forest Service 2002a).

Where *Linanthus killipii* occurs on pebble plains, it co-occurs with three Federally Threatened, eight Forest Service Sensitive, and seven Watch List pebble plain plant species (USDA Forest Service 2002b), including *Arenaria ursina*, *Eriogonum kennedyi*, and *Arabis parishii*. In alkaline meadows, *Linanthus killipii* may be associated with the Federally Endangered *Taraxacum californicum* and the Federally and California Endangered *Thelypodium stenopetalum* and *Sidalcea pedata*.

While dry slopes within pinyon-juniper woodlands are relatively widespread across the northern portion of the SBNF, pebble plains and alkaline meadows have a very restricted distribution that has declined over the past several decades. All known pebble plain habitat and most alkaline meadow habitat is located in the northeastern portion of the SBNF, centered on the Holcomb and Big Bear Valleys. Pebble plains and alkaline meadows on Forest System lands are impacted by vehicle use off designated roads, alteration of surface hydrology, invasion of exotic species, unauthorized dumping near Baldwin Lake, fuelwood collection, and ground disturbance from gold mining activities (USDA Forest Service 2002b).

Occurrence Status

Several new occurrences of *Linanthus killipii* were also located in 1998 north and east of Baldwin Lake; however, it is thought that the El Niño event that year played a major role in the number of individuals observed (USDA Forest Service 2002a). Although trends in abundance and distribution are unknown, it is likely that *Linanthus killipii* has declined due to habitat loss and degradation from a variety of authorized and unauthorized Forest uses, and by residential development on private land. In some locations, measures to protect pebble plain habitat and locations of federal listed taxa on the SBNF has been beneficial to this taxon.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Linanthus killipii* (Baldwin Lake linanthus)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1	U	1989	North Baldwin Lk and Mojave View units of Big Bear Valley Preserve System. San Bernardino Mtns. DFG, SBNF, PVT	SBD
2	U	1980	Approx. 1.1 air mi SE of Gold Mtn., Bear Valley. San Bernardino Mtns. SBNF	SBD
3	U	1980	Approx. 0.5 air mi S of Canyon Spring, E side of Baldwin Lk. San Bernardino Mtns. SBNF	SBD
4	U	1980	Approx. 0.6 air mi W of Granite Spg, approx. 2.0 air mi E of S end of Baldwin Lk. San Bernardino Mtns. SBNF	SBD
5	U	1980	Approx. 2.0 air mi W of Granite Sprg and 0.6 mi E of S end of Baldwin Lk. San Bernardino Mtns. SBNF, PVT	SBD
7	U	1984	Approx. 0.25 mi N of NE corner of town of Sugarloaf, Bear V. San Bernardino Mtns. PVT	SBD
9	U	1980	0.2 mi N of Deadman's Lk, approx. 1.5 mi ESE of Bear Valley. San Bernardino Mtns. PVT	SBD
11	U	1984	E side Erwin Lk, Bear Valley. San Bernardino Mtns. PVT	SBD
12	U	1980	South side of Baldwin Lake, east side of marsh. Bear Valley. San Bernardino Mtns. SBNF, PVT	SBD

13	U	1980	About 2.5 air miles west of Tip Top Mountain, San Bernardino Mtns. SBNF	SBD
14	U	1980	Approx. 1.5 air mi WSW of Tip Top Mtn, San Bernardino Mtns. N of Yokum Spring. SBNF	SBD
15	U	1980	Broom Flat, E to Broom Spring, San Bernardino Mtns. SBNF	SBD
18	U	1980	Approx. 0.8 air mi NE of Broom Spring, San Bernardino Mtns. SBNF	SBD
19	U	1980	0.15 mi WSW of summit of Mineral Mtn, San Bernardino Mtns. SBNF	SBD
21	U	1941	Cactus Flat, on upper desert slopes, San Bernardino Mts. Type locality. SBNF	SBD
*	> 1,000	2000	Baldwin Lake Ecological Reserve, east of the parking area and north up meadow drainage, in sandy areas east of meadow drainage within sagebrush. SBNF, CDFG	SBD
UCR91002	U	1995	Smart's Ranch Road (3N03) crossing of Arrastre Creek, 4.9 mi SE of Hwy 18. Brush pinyon woodland w/ jeffrey pines along canyon bottom. (Sanders)	SBD

UCR123653	U	2001	S of Baldwin Lake, ca 0.6 mi SE of the junction of CA Hwy 38 and Shay Road. Slopes near the Los Vaqueros de las Montañas Arena (horse arena). Large, level grassy mountain meadow bordered by open juniper-pinyon pine woodland on dry rocky slopes. Disturbed roadside. (Hill/Kramer)	SBD
UCR27049	U	1980	Big Bear Valley. West side of Maple Lane, site of proposed High School. Probably extirpated. (Krantz)	SBD
UCR24611	U	1980	Bear Valley. Restricted to edges of Sawmill pebble plain. 2N,1E, Sec 23. (Krantz)	SBD
UCR27034	U	1980	1.9 mi. east of Arrastre Creek on road 2N02. 02N02E13. (Krantz)	SBD
UCR24606	U	1980	South of Round Valley. 2N3E Sec30 (Krantz)	SBD
24635 (UCR)	U	1979	Baldwin Lake; N of the lake on both sides of Hwy 18 (Krantz/UCR)	SBD
24636 (UCR)	U	1978	On first hairpin turn of Hwy 18, north of Baldwin Lake, T3N/R2E/S31 (Derby UCR)	SBD
27033 (UCR)	U	1980	Broom Flats, T2N/R2E/S25 (Krantz/UCR)	SBD
27034 (UCR)	U	1980	1.9 mi east of Arrastre Creek on road 2N02, T2N/R2E/S13 (Krantz/UCR)	SBD

● = *Unknown*

- * = an occurrence number has not been assigned
- SBNF = San Bernardino National Forest
- CDFG = California Department of Fish and Game
- SBD = San Bernardino County

Threats

Threats to *Linanthus killipii* occurrences and suitable habitat have decreased in recent years, resulting from protective measures for pebble plain and meadow habitat implemented by the Forest Service. However, several occurrences are still threatened by fuels and vegetation treatments, dispersed camping, unauthorized woodcutting, and vehicle use off designated roads and OHV trails, especially during wet months when soil and surface hydrology are vulnerable to long term impacts.

Conservation and Management Considerations

The following list of conservation practices should be considered for *Linanthus killipii*:

- Implement actions in the SBNF Pebble Plain and Meadow Habitat Management Guides to the greatest extent practicable.
- Survey all new occurrences of *Linanthus killipii* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Linanthus killipii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Linanthus killipii* in the planning area using NRIS data collection standards, and incorporate these occurrences into the SBNF Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Linanthus killipii is locally abundant in above-average rainfall years. It is a San Bernardino endemic species that is very narrowly distributed from eastern Bear Valley (Baldwin Lake Area) eastward to Broom Flats and Lone Valley. Some of this species' habitat is protected from identified threats, but most is not well protected.

Based on the above analysis, *Linanthus killipii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	A	A	B	A	C	A

Linanthus killipii is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The viability of this species across much of its narrow range is tied to protection and management of pebble plain and meadow habitats. Existing protections of these habitats for the benefit of the associated federally listed plant species provide considerable baseline protection. With full implementation of the Pebble Plain and Meadow Habitat Management Guides, viability for this species on NFS lands is secure.

The existing Baldwin Lake/Holcomb Valley Special Interest Area will provide important protection for this species across all alternatives. Under Alternatives 2-6, this taxon would receive a higher level of protection within this SIA due to Standard S33.

Under Alternative 1, pebble plain and other open-structure habitats in general, and *Linanthus killipii* in particular, would continue to be at risk from unauthorized vehicle travel off Forest Transportation System roads and trails.

Under Alternative 2, the Gold Mountain Critical Biological zoning and Back Country Non-Motorized zoning at lower Sugarloaf would provide substantial protection for this species. Under Alternative 3, the Gold Mountain Critical Biological zone and the Sugarloaf proposed wilderness would provide substantial protection for this species. Under Alternative 4, the Sugarloaf proposed wilderness would provide protection for limited portions of the species range, however the important protections associated with the Gold Mountain Critical Biological zone would not occur. Under Alternative 4a, the Gold Mountain Critical Biological zone, Arrastre Flat Research Natural Area, Back Country Motorized Use Restricted zoning at lower Sugarloaf, the Broom Flat recommended RNA, the Arrastre Creek SIA, and the Heartbreak Ridge recommended wilderness would provide substantial protection across major portions of this species' range. Under Alternative 5, land use zoning would not provide any protection. There are also no special area designation recommendations that would provide protection for this taxon under Alternative 5. Under Alternative 6, Back Country Non-Motorized zoning across the range of the species, the Gold Mountain Critical Biological zone and the Sugarloaf proposed wilderness would provide substantial protection.

Consideration of the Suitable Use restricting motorized and mechanized vehicle travel to National Forest System roads and trails, along with Standards associated with riparian habitat, mining, and recreation factor into the outcomes. The Gold Mountain Critical Biological zone, Arrastre Flats Research Natural Area, the Broom Flat Research Natural Area, and the recommended Heartbreak Ridge

wilderness, where applied, are critical to the outcomes. Presumed implementation of the Pebble Plain and Meadow Habitat Management Guides is key to these outcomes under all alternatives.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

The habitat for *Linanthus killipii* on private lands in Big Bear Valley, has been highly reduced and fragmented by residential and commercial development. This is a relatively small but core portion of this species historic distribution. The remaining fragments on private land continue to be lost at an increasing rate as development of the Baldwin Lake area continues. This loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF.

By maintaining the current distribution of *Linanthus killipii* on National Forest System lands, no alternatives expected to contribute substantial adverse cumulative effects that would cause *Linanthus killipii* to suffer a decline in its overall distribution.

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Linanthus jaegeri

Linanthus orcuttii

Linanthus orcuttii

Linanthus orcuttii (Parry & Gray) Jepson (Orcutt's linanthus)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4, S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-2

General Distribution

Linanthus orcutti, Orcutt's linanthus, occurs primarily in the Peninsular Ranges in San Diego and Riverside counties (Patterson 1993; California Native Plant Society 2001). A population was recently found in the eastern San Bernardino Mountains in San Bernardino County (Sanders 1996), and there is a historic record from Los Angeles County (California Native Plant Society 2001). *Linanthus orcutti* also occurs in northern Baja California Norte, Mexico (California Native Plant Society 2001). Occurrences in the San Bernardino mountains are disjunct from the Laguna and Palomar Mountains (Krantz et. al. 2002).

Distribution in the Planning Area

Within the National Forest System, *Linanthus orcuttii* occurs on the Cleveland and San Bernardino National Forests with potential habitat on the Angeles National Forest (Stephenson and Calcarone 1999; California Natural Diversity Database 2002). On the Cleveland National Forest, locations are known from Laguna Mountain, Palomar Mountain and within the Agua Tibia Wilderness. On the San Bernardino National Forest one occurrence is recorded for Onyx Peak, another is recorded from Broom Flat (Krantz et. al. 2002). There is also a recorded occurrence near the Forest in the Burns Reserve (Krantz et. al. 2002).

Taxonomy and Natural History

Linanthus orcutti is a small a sparsely pubescent, herbaceous annual in the phlox family

(Polemoniaceae) that is 5-10 cm tall. Leaf lobes are 5-12 mm, linear, and hairy. The inflorescence is bracted in clusters or solitary flowers. Flowers are sessile with a calyx of 6-10 mm, membrane less than half the calyx length, extended along lobes. The corolla is funnel-shaped, with white to pink tubes of 5-15 mm and yellow throats. Petal lobes are 5-8 mm, pink, blue, or white with purple kidney-shaped marks at the base. Stamens are included in the throat (Patterson 1993). Plants flower from May to June (California Native Plant Society 2001).

The plant can occur in populations of several thousand plants, and appears to be more abundant in years of higher rainfall (California Natural Diversity Database 2002).

Habitat Description

Linanthus orcutti grows in openings in chaparral, lower montane coniferous forest, and pinyon-juniper woodland at elevations of 3,000–7,050 feet (915-2,145 meters) (California Native Plant Society 2001). It usually grows in vernal moist openings (Stephenson and Calcarone 1999), and is sometimes found in disturbed areas (California Natural Diversity Database 2002).

Occurrence Status

The California Natural Diversity Database (CNDDDB) reports 24 occurrences of *Linanthus orcutti* (California Natural Diversity Database 2002). Two of these occurrences are on privately owned lands and the remaining occurrences are on publicly owned lands. One occurrence is in Palomar Mountain State Park, three on Cuyamaca Rancho State Park, and one on Bureau of Indian Affairs land at the Los Coyotes Reservation. On National Forest System lands, two occurrences are known for the San Bernardino National Forest at Onyx Peak and Broom Flat, and 23 occurrences are recorded for the Cleveland National Forest. Several of the National Forest occurrences are large, having greater than 2000 plants at each location.

OCCURRENCE DATA of *Linanthus orcuttii* (Orcutt's linanthus)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
9 ?	2-1	U	1898 1964	Palomar Mt/ CNF	SD
24 ?	2-2	U	1901	Cutca / CNF	SD
1	2-3	U	1920	Morgan Hill / CNF	SD

2	2-4	U	1945	Bailey's Camp / private	SD
3	2-5	U	1963	Henshaw Dam / private	
7	2-6	2000+	1979	Laguna Recreation Area / CNF	SD
*	2-7	U	U	Doane Valley / CNF (partial)	SD
*	2-8	U	U	Iron Springs/ private	SD
5	2-9	2000+	1990	Agua Tibia Wilderness / CNF	SD
22	2-10	U	U	Agua Tibia Wilderness / CNF	SD
8	2-11	U	1975	Garnet Peak / CNF	SD
18	2-12	25	1990	Sierra Club Guymon Lodge / CNF	SD
23	2-13	2000+	1995	Magee Palomar Trial / CNF	SD
19	2-14	200	1990	Laguna Mountains / CNF	SD
19	2-15	100	1990	Laguna Mountains / CNF	SD
19	2-16	100	1990	Laguna Mountains / CNF	SD
19	2-17	2000	1990	Camp Ole Fire Station / CNF	SD

19	2-18	150	1990	Camp Ole Fire Station / CNF	SD
8	2-19	3000	1993	Garnet Peak / CNF	SD
17	2-20	300	1992	Laguna Mountains / CNF	SD
17	2-21	10	1992	Laguna Mountains / CNF	SD
*	2-22	U	1993	Filaree Flat / CNF	SD
6	U	U	1979	Agua Tibia Range / CNF	SD
4	2-2	2000+	1995	Cutca Trail / CNF	SD
18	U	7	1990	Sierra Guyman Lodge / CNF	SD
20	2-23	3	1996	Pine Mountain / CNF	SD
26	U	U	1980	Broom Flat / SBNF	SBD
*	*	U	U	Onyx Peak / SBNF	SBD

- U = Unknown
- * = an occurrence number has not been assigned
- SBNF = San Bernardino National Forest
- CNF = Cleveland National Forest
- SBD = San Bernardino County
- SD = San Diego County

Threats

Threats to occurrences on private lands are unknown. On the Cleveland National Forest populations are affected by trampling by hikers at occurrences in the Laguna Mountains Recreation Area and along trails in Palomar Mountain. Populations within the Agua Tibia Wilderness are relatively undisturbed, as this

location receives few visitors. Dispersed recreation may affect population locations on the San Bernardino National Forest. Unauthorized grazing sometimes occurs in the Broom Flat area, management of this situation is ongoing with the Bureau of Land Management.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Linanthus orcuttii*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Allow wildland fires to freely burn through known habitat. Minimize earth-movement during fire suppression activities to avoid burying seeds to greater than 2 inches in depth.
- On the San Bernardino National Forest, relocate all occurrences, collect vouchers as appropriate and collect habitat information. Protect as necessary.

Evaluation of Current Situation and Threats on National Forest System Lands

Linanthus orcuttii is an annual plant, with population sizes that fluctuate in response to rainfall. On the Cleveland National Forest, some occurrences near trails and campgrounds are at risk of being trampled by hikers, and one occurrence is within grazing allotment. However, the persistence of occurrences within disturbed areas, such as trails, roadsides, and ruts, indicates some tolerance for disturbance in this species. Other populations are protected within the Agua Tibia Wilderness. The occurrences at the Sierra Club Lodge and at the USFS Laguna Fire station are protected from effects due to education of permittees and fire crew personnel. Although recreation and grazing activities have the potential for short-term negative impacts to this species, it appears that current Forest Service activities do not pose a substantial threat to *Linanthus orcuttii*.

On the San Bernardino National Forest, habitat protection measures implemented at Onyx Peak and Broom Flat for federally listed species under the Southern California Conservation Strategy are expected to improve habitat in those locations over the long term. In addition, the Forest recently acquired a large parcel of land in Broom Flat which may benefit habitat. Management of unauthorized grazing in Broom Flat is ongoing with the BLM.

Consideration was given to the number of locations on the Cleveland National Forest, the habitat condition of many of these locations, that this taxon appears to withstand some level of disturbance, the range of the taxon, and that there are no substantial threats from FS activities to habitat.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Linanthus orcuttii is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Linanthus orcuttii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Linanthus orcuttii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Linanthus killipii

**Lonicera subspicata var.
subspicata**

Lonicera subspicata var. subspicata

Lonicera subspicata H. & A. ssp. *subspicata* (Santa Barbara honeysuckle)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G5T2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-3-3

General Distribution

Lonicera subspicata ssp. *subspicata* is found on Santa Catalina Island and on the mainland in Santa Barbara County. On the mainland, California Native Plant Society (2001) lists four 7.5 Quads where this subspecies is extant. According to Smith (1998) it is found on south side of Santa Ynez Mountains, from Carpinteria to Goleta and Refugio Canyon area, and from Mission La Purisima inland to Birabent Canyon.

Upon review of this account in 2004, Painter states that "according to Dieter Wilken, based on specimens at the Santa Barbara Botanic Garden, the report from Santa Cruz Island is based on a misidentification" (Painter 2004). Since Santa Cruz Island is not mentioned in this account, it could be that she meant the Santa Catalina Island reference above or that she really meant Santa Cruz Island and we just did not have that information here. Clarification is needed.

Distribution in the Planning Area

In CalFlora (2002) there are eight records for *Lonicera subspicata* ssp. *subspicata* that are from the south side of the Santa Ynez Mountains and, although none of these records explicitly indicate the presence of *Lonicera subspicata* ssp. *subspicata* on National Forest System land, it is clear that this subspecies has potential habitat on the Los Padres National Forest.

Taxonomy and Natural History

Lonicera subspicata ssp. *subspicata* is a dicot in the honeysuckle family (Caprifoliaceae). The upper

leaf pairs in *Lonicera subspicata* ssp. *subspicata* are not fused around the stem as they are in other closely related honeysuckles that have long, interrupted flower spikes, and the relatively longer leaf (3-4 times longer than wide) separates this subspecies from *Lonicera subspicata* ssp. *denudata* (Dempster 1993).

Lonicera subspicata ssp. *subspicata* is a perennial shrub.

Habitat Description

Lonicera subspicata ssp. *subspicata* is found in chaparral, cismontane woodland, and coastal scrub at elevations of 115–3,280 feet (35–1,000 meters) (California Native Plant Society 2001)

Occurrence Status

The population status and trend of *Lonicera subspicata* ssp. *subspicata* is unknown. Smith (1998) reports "scattered in coastal scrub, woodland, chaparral, etc.

Threats

Development on private lands in the foothills of the Santa Ynez Mountains is the only known threat to *Lonicera subspicata* ssp. *subspicata*.

Conservation and Management Considerations

More information is needed to determine if *Lonicera subspicata* ssp. *subspicata* actually occurs on the Los Padres National Forest.

Evaluation of Current Situation and Threats on National Forest System Lands

Lonicera subspicata ssp. *subspicata* is not known to occur on National Forest System lands but may occur on the Los Padres National Forest based on the presence of known occurrences just below the forest boundary in the Santa Ynez Mountains of Santa Barbara County.

Based upon the above analysis *Lonicera subspicata* ssp. *subspicata* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Lonicera subspicata* ssp. *subspicata* are known to occur on National Forest System

lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupported assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Lonicera subspicata* ssp. *subspicata*.

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Linanthus orcuttii

Lupinus ludovicianus

Lupinus ludovicianus

Lupinus ludovicianus Greene (San Luis Obispo County lupine)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2 S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Lupinus ludovicianus is endemic to (and is the official flower of) San Luis Obispo County. The range of *Lupinus ludovicianus* is centered in the upper Arroyo Grande watershed and extends to the hills north of Price Canyon and to the summit between Arroyo Grande and Huasana Valley (Hoover 1970). The California Natural Diversity Database (2004) lists records for 16 occurrences.

Distribution in the Planning Area

Lupinus ludovicianus occurs on the Los Padres National Forest northeast of Lopez Lake (CNDDDB Occurrence #19). Several occurrences are reported from the vicinity of the Arroyo Grande Ranger Station and one from 4 miles north of Pozo, but they are on private property adjacent to National Forest Service System lands (California Natural Diversity Database 2004).

Taxonomy and Natural History

Lupinus ludovicianus is a dicot in the legume family (*Fabaceae*). It is distinguished from similar congeners by morphological characters, primarily woolly or densely hairy leaves and petiole and flower length (Riggins and Sholars 1993).

Lupinus ludovicianus is a perennial herb that blooms April–July (California Native Plant Society 2001).

Habitat Description

Lupinus ludovicianus grows on sandy or sandstone-derived soils in chaparral and in open grassy areas in foothill oak woodlands (coast live oak) at elevations below 1,500 feet (460 meters). Plants typically grow in sandy soils associated with the Santa Margarita formation, but one occurrence is found on limestone soil.

Occurrence Status

The single occurrence of *Lupinus ludovicianus* on the Los Padres National Forest consists of about 20 plants (California Natural Diversity Database 2004). This occurrence is not found within a grazing allotment and it is located in an area that is difficult to access due to adjoining private property. Little if any dispersed recreation occurs where this occurrence of *Lupinus ludovicianus* is found. The forest occurrence (#19) and other locations where this taxon is found off of NFS lands are listed in the table below.

OCCURRENCE DATA – *Lupinus ludovicianus* (San Luis Obispo County Lupine)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1936	1 MI N OF PARK RANCH, T32S/R15E	SLO
2	1000+ in 1986	1986	ARROYO GRANDE CREEK, ABOUT 2.1 MILES EAST OF RANGER STATION ON HI MOUNTAIN ROAD. MAPPED ALONG SOUTH SIDE OF ROAD SOUTH OF ARROYO GRANDE CREEK. WITHIN THE N 1/2 NE 1/4 SECTION 30.	SLO
4	U	1933	SAUCELITO CANYON, UPPER ARROYO GRANDE VALLEY, T31S/R15E/S30	SLO

5	2000+ in 1986	1986	CANYON OF ARROYO GRANDE CREEK, ABOUT 4.5 MILES EAST OF LOPEZ DAM, ABOVE CONFLUENCE WITH PHOENIX CREEK. MAPPED DUE NORTH OF CONFLUENCE OF ARROYO GRANDE CREEK AND PHOENIX CREEK, T31S/R14E/S35	SLO
6	200 in 1980, reduced to 60 after cattle grazing, sight has not been seen since 1980	1980	ABOUT 0.8 MILE ENE OF INDIAN KNOB ALONG BOTH SIDES OF DIRT ROAD, NORTH OF PISMO BEACH. MAPPED ALONG BOTH SIDES OF ROAD WITHIN THE SW 1/4 NW 1/4 SECTION 25.	SLO
7	2000+ in 1986	1994	PARK HILL ROAD, NORTH AND EAST OF RIVER ROAD, BETWEEN TORO CREEK AND YARO CREEK, NORTHEAST OF SANTA MARGARITA RESERVOIR. MAPPED WITHIN THE NE 1/4 NW 1/4 SECTION 32, E 1/2 SECTION 32, THE SW 1/4 NW 1/4 SECTION 33, AND THE W 1/2 SW 1/4 SECTION 33.	SLO
10	U	1906	OAK PARK (SCH) ALONG ROAD 1.9 MILES SOUTHEAST OF TIBER SIDING ON SPRR, 2 MILES SOUTH OF EDNA STATION, T32S/R13E	SLO
11	U	1958	SUMMIT BETWEEN ARROYO GRANDE & HUASNA.	SLO

17	U	1982	HILLS N OF PRICE CANYON, N OF PISMO CR, NNE OF PISMO BEACH, T31S/R12E	SLO
18	75 in 1982, 60 in 1986	1986	4.1 MILES EAST OF ARROYO GRANDE RANGER STATION ALONG TRIBUTARY TO TROUT CREEK, NNW OF CALDWELL MOUNTAIN. MAPPED ON ROAD BANK SOUTH OF ROAD AND ABOVE CREEK WITHIN THE SE 1/4 SE 1/4 SECTION 21.	SLO
19	2 in 1980, 20 in 1986	1986	HUFFS HOLE NEAR CONFLUENCE WITH DRY CREEK ALONG LOPEZ CANYON ROAD, NORTHEAST OF LOPEZ LAKE. ALONG LOPEZ CANYON ROAD ABOUT 2.7 MILES NORTH OF HI MOUNTAIN ROAD. MAPPED WITHIN THE NE 1/4 NW 1/4 SECTION 23. LPNF	SLO
20	50 in 1982, 100 in 1986	1986	SOUTH OF ARROYO GRANDE CREEK, ABOUT 2.5 MILES EAST OF ARROYO GRANDE RANGER STATION. MAPPED ALONG SOUTH SIDE OF ROAD ADJACENT TO BARLEY FIELD, MOSTLY WITHIN THE NW 1/4 NW 1/4 SECTION 29.	SLO

21	150-200 in 1982	1982	SAUCELITO RIDGE, SOUTHEAST OF POTRERO FIELD AND EAST OF LOPEZ LAKE. EXACT LOCATION NOT KNOWN. SITE IS DESCRIBED AS "T31S R15E SECTION 31 (UNCHARTED), RIDGE SE OF POTRERO FIELD...ACCESS VIA FIRE BREAK SAUCILITO CANYON 2.3 MILES SOUTH OF HI MOUNTAIN ROAD...ON SE-FACING SLOPES", T31S/R15E/S31	SLO
22	20 in 1980, 0 in 1986	1980	ALONG HUASNA ROAD ABOUT 1.5 MI EAST OF HUASNA SCHOOL ROAD, BETWEEN HUASNA CREEK AND HUASNA RIVER, SW OF CALDWELL MTN. ON NORTH SIDE OF HUASNA ROAD ABOUT 150-200 METERS EAST OF SPRING, T32S/R15E/S21	SLO
23	200 in 1982, 0 in 1986	1982	ABOUT 0.5 MILE NORTH OF HAUSNA ROAD AND 0.5 MILE WEST OF HUASNA RIVER, SOUTHWEST OF CALDWELL MOUNTAIN.MAPPED ALONG GULLIES ALONG SW SIDE OF UNNAMED TRIBUTARY TO HUASNA RIVER, T32S/R15E/S16	SLO
24	30 in 1993	1993	SANTA MARGARITA RANCH, APPROX 0.6 MILE WEST OF JCT OF POZO ROAD AND LAS PILITAS ROAD. WEST OF UNMAPPED DIRT ROAD ON THE NE SIDE OF LOW RIDGE, T29S/R13E	SLO

- = *Unknown*
- * = an occurrence number has not been assigned
- SLO = San Luis Obispo

Threats

Habitat conversion to agricultural uses and urban development, livestock grazing and trampling, and off-highway vehicle activities are factors believed to be negatively affecting this species on private land. One occurrence on the Los Padres National Forest and other populations on private property are somewhat protected by their remote locations (Stephenson and Calcarone 1999) although road maintenance at the Huff’s Hole site near Upper Lopez Canyon Road may be affecting road-side plants.

Conservation and Management Considerations

Monitor the occurrence (#19) of *Lupinus ludovicianus* found on National Forest System land to determine its status.

Evaluation of Current Situation and Threats on National Forest System Lands

Lupinus ludovicianus is a narrow endemic that is found at only one location on NFS land and this location is threatened only by a lack of knowledge regarding its precise location. This lack of information makes it difficult to protect the plant’s habitat from fire suppression activities.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
E	E	E	E	E	E	E

Lupinus ludovicianus is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The small size of the one population of *Lupinus ludovicianus* found on NFS land makes it susceptible to stochastic events. The potential for extirpation is largely unrelated to uses and activities on NFS land.

Viability Outcomes For All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

Some occurrences have been impacted or lost due to urbanization, and additional habitat is at risk of being developed. In some areas habitat is affected by on-going land uses such as grazing and off highway vehicle use. Some occurrences of *Lupinus ludovicianus* may become extirpated as a result of these land uses and trends in land use.

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**Lonicera subspicata var.
subspicata**

Malacothamnus aboriginum

Malacothamnus aboriginum

Malacothamnus aboriginum (Rob.) Greene (Indian Valley bush mallow)

Management Status

Federal: None

California: None

Heritage Rank: G3, S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B R-E-D Code 2-2-3

General Distribution

Malacothamnus aboriginum, Indian Valley bush mallow occurs in the inner South Coast Ranges in San Benito, Monterey, and Fresno counties (California Native Plant Society 2001). The type locality is Indian Valley, Monterey County (Painter 2004) and it is documented by several collections in central California.

Reiser (1994) lists occurrences in San Diego County and it has been reported from the Laguna Mountains in San Diego County (Bates 1993). Specimens collected in the Laguna Mountains were re-examined by Boyd, Painter and Wilken and are no longer considered to be this taxon (Painter pers. comm.; Winter pers. comm.). Specimens from southern California have been determined to be *Malacothamnus densiflorus* (Painter 2004).

Distribution in the Planning Area

Although *Malacothamnus aboriginum* occurs in Monterey County it is not expected to occur on the Los Padres National Forest. In preparation for the update of the Region 5 Sensitive Plant Species list in 2005, Mike Foster, Forest botanist for the Los Padres National Forest (LPNF) submitted the "rationale for not listing this taxon as a Region 5 Sensitive Species on the LPNF as found east of Hwy. 101 in eastern Monterey County and San Benito County" (USDA Forest Service 2004).

Although this taxon has been documented as occurring on the Cleveland National Forest, recent collections from southern California populations deposited at Rancho Santa Ana Botanical Garden and California Academy of Sciences for identification resulted in identification of plants at CNF locations as

Malacothamnus densiflorus rather than *M. aboriginum* (Painter pers. comm., Painter 2004, Winter pers. comm.).

Taxonomy and Natural History

Malacothamnus aboriginum is a coarse, deciduous shrub (3-10 feet) in the mallow family (Malvaceae) that flowers from April–October (California Native Plant Society 2001). This species is distinguished from other shrubby members of the genus *Malacothamnus* in the vicinity of San Diego County, by the presence of broad calyx lobes, 4 to 8 mm wide. These shrubs originate from a woody base with densely tomentose stems and twigs. Leaf blades are gray-green and broadly ovate, 3 to 6 cm long, 3 to 5 lobed, crenate to dentate, cordate at base with stellate pubescence; petioles 1 to 3.5 cm long. Flowers are elongate on a somewhat bare inflorescence with 3 ovate bractlets 6 to 8 mm in length. The calyx is strongly angled in bud, 8 to 10 mm long, with lobes 4 to 6 mm long and somewhat wider; petals 12 to 14 mm. The carpels are approximately 3 mm (Beauchamp and Sproul 1979; Bates 1993).

The species appears in abundance after fires (California Native Plant Society 2001).

Habitat Description

Malacothamnus aboriginum grows on granitic outcrops and sandy bare soil, often in disturbed areas, in cismontane woodlands and chaparral habitats, at elevations of 490–5,525 feet (150–1,700 meters) (California Native Plant Society 2001).

Occurrence Status

California Natural Diversity Database (CNDDDB) reports two occurrences for *Malacothamnus aboriginum* with the Bureau of Land Management (BLM) jurisdiction in San Benito County, and four occurrences on private land; there are also occurrences of unknown ownership (2002).

Threats

Threats to *Malacothamnus aboriginum* populations on non-Forest Service lands include heavy grazing on private lands, OHV impacts to a population of 3 individuals on BLM land, BLM lands that may be transferred to private ownership, herbicide application, and close proximity to roads and highways (California Natural Diversity Database 2004).

Conservation and Management Considerations

There are no recommendations for this taxon on NFS lands as it is not expected to occur.

Evaluation of Current Situation and Threats on National Forest System Lands

This taxon does not occur on the Cleveland National Forest as previously thought and it is not expected to occur on the Los Padres National Forest (USDA Forest Service 2004).

Based upon the above analysis this species has been assigned the following threat category:

1. Not found in the Plan area.

Viability Outcomes

No populations of *Malacothamnus aboriginum* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupported assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Malacothamnus aboriginum*.

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Personnel communication

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Lupinus ludovicianus

Malacothamnus davidsonii

Malacothamnus davidsonii

Malacothamnus davidsonii (Rob.) Greene (Davidson's bush mallow)

Management Status

Federal: Forest Service Watch List; Bureau of Land Management Sensitive

California: None

Heritage Rank: G1 S1.1 – very threatened (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Malacothamnus davidsonii is reported to occur in the central outer South Coast Ranges in Monterey and San Luis Obispo Counties, in the eastern San Fernando Valley, and at the western end of the San Gabriel Mountains in Los Angeles County (Hickman 1993, California Natural Diversity Database 2002).

Distribution in the Planning Area

Within the San Gabriel Mountains in the Angeles National Forest, *Malacothamnus davidsonii* is known to occur at the Bear Divide area, Little Tujunga Canyon, Lopez Canyon, upper Haines Canyon, Loop Canyon, Big Tujunga Wash and Pacoima Canyon (Stephenson and Calcarone 1999).

Malacothamnus davidsonii is documented from Camp Roberts by several specimens and is also documented from Fort Hunter Liggett by several specimens collected during the Fort Hunter Liggett floristic survey (Painter 2004). *Malacothamnus davidsonii* is documented in Monterey County by several additional collections (Painter 2004). There are no documented occurrences of *Malacothamnus davidsonii* on the Los Padres National Forest but the presence of the species on the adjoining lands of Fort Hunter Liggett suggests that the taxon could be found on National Forest System land there as well.

Taxonomy and Natural History

Malacothamnus davidsonii is a dicot in the mallow family (Malvaceae). Bush mallows are highly variable, and intergradation between species is common. *Malacothamnus davidsonii* intergrades with

chaparral mallow (*M. fasciculatus*) but can be distinguished by the size and shape of the leaves and the density of hairs on the leaves (Hickman 1993).

Malacothamnus davidsonii is a deciduous shrub that blooms from June through January (California Native Plant Society 2001).

Habitat Description

In the South Coast Ranges, *Malacothamnus davidsonii* occurs on slopes in coastal scrub, chaparral, and pine-oak woodland, from ridges down to the riparian zone (California Natural Diversity Database 2002). In Los Angeles County, *Malacothamnus davidsonii* occurs in coastal scrub and chaparral along streams and lower slopes (California Natural Diversity Database 2002). *Malacothamnus davidsonii* is a fire follower, appearing in the first three to four years after a fire, but then it may not be found until the next fire event (Stephenson and Calcarone 1999).

Occurrence Status

Malacothamnus davidsonii is distributed in limited occurrences in California and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). The population trends and vulnerability of this species on National Forest System lands are unknown (Stephenson and Calcarone 1999).

Threats

Specific risks for *Malacothamnus davidsonii* on National Forest System lands have not been identified. In Los Angeles County, it is threatened by habitat loss due to urbanization (California Native Plant Society 2001). At Camp Roberts, threats and potential threats include: nonnative plants, sheep, cattle trespass, feral pigs, military training activities, too frequent fires, out of season fires, high water release from San Antonio Reservoir, activities related to recreational hunting, tramping, soil compaction and dust (Painter 2004).

Conservation and Management Considerations

Determine the status of *Malacothamnus davidsonii* on National Forest System lands. Two to four years after wildfire events in potential habitat, survey for *Malacothamnus davidsonii* to determine the species response to wildfire events.

Evaluation of Current Situation and Threats on National Forest System Lands

Malacothamnus davidsonii has a fairly wide distribution in California and is known to occur on the Angeles National Forest at seven locations. Although *Malacothamnus davidsonii* is uncommon within this broad range, there is no indication that current or anticipated land uses on National Forest System

lands are affecting the abundance or distribution of the species.

Based upon the above analysis *Malacothamnus davidsonii* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Malacothamnus davidsonii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Malacothamnus davidsonii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Malacothamnus aboriginum	Malacothamnus palmeri var. involucratus
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Malacothamnus palmeri var. involucratus

Malacothamnus palmeri (Wats.) Greene var. *involucratus* (Rob.) Kearn (Carmel Valley bush mallow)

Management Status

Federal: Forest Service Watch List; Bureau of Land Management Sensitive

California: None

Heritage Rank: G4T2Q S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Malacothamnus palmeri var. *involucratus* is found in San Luis Obispo and Monterey counties (California Native Plant Society 2001). There are 32 observations of this species reported in the CalFlora database, 27 in Monterey County and 5 in San Luis Obispo County (CalFlora 2002).

Distribution in the Planning Area

Malacothamnus palmeri var. *involucratus* is believed to occur on or near the Los Padres National Forest near Cerro Alto Campground at the north end of the Santa Lucia Ranger District (California Natural Diversity Database 2004). The taxonomic status of this occurrence needs to be determined since *Malacothamnus palmeri* var. *palmeri* has also been collected from this location and Painter (2004) states that this report may be based on a misidentification of *M. palmeri* var. *palmeri*. This taxon may also occur on the Monterey Ranger District based on collections of *Malacothamnus palmeri* var. *involucratus* from Fort Hunter Liggett during the Fort Hunter Liggett floristic survey (Painter 2004).

Taxonomy and Natural History

Malacothamnus palmeri var. *involucratus* is a dicot in the mallow family (Malvaceae) and is considered a synonym of *Malacothamnus palmeri* by some taxonomic authorities (Bates 1993). *Malacothamnus palmeri* is distinguished from other members of the genus *Malacothamnus* by its wider bracts subtending the calyx and head-like inflorescence (Bates 1993). Matthews (1997) separates *M. palmeri*

var. *involucratus* from *M. palmeri* var. *lucianus* on the basis of leaf color (bright green versus pale green), the location of stellate hairs on the leaves (lower surface only versus both surfaces), bract shape (entire and lanceolate versus ovate and lobed), and petal length (10-20 mm versus 20-30 mm).

Malacothamnus palmeri var. *involucratus* is a perennial, deciduous shrub that flowers from May–October (California Native Plant Society 2001).

Habitat Description

Malacothamnus palmeri var. *involucratus* grows in chaparral, cismontane woodland, and coastal scrub. The elevation range for *Malacothamnus palmeri* var. *involucratus* is 100–3,600 feet (30–1,100 meters) (California Native Plant Society 2001). In Monterey County, habitat for *Malacothamnus palmeri* var. *involucratus* is described as "disturbed places" (Matthews 1997).

Occurrence Status

There is no site-specific information on the status of occurrences of *Malacothamnus palmeri* var. *involucratus*.

Threats

Malacothamnus palmeri var. *involucratus* is distributed in a limited number of occurrences. The California Native Plant Society (2001) considers this plant to be at risk in portions of its range due to development in Monterey County.

Conservation and Management Considerations

More survey work is needed to determine the status of *Malacothamnus palmeri* var. *involucratus* at Cerro Alto and to determine if there are occurrences of *Malacothamnus palmeri* var. *involucratus* on the Los Padres National Forest.

Evaluation of Current Situation and Threats on National Forest System Lands

Malacothamnus palmeri var. *involucratus* has been reported to occur on or near the Los Padres National Forest near Cerro Alto but this location has not been relocated to determine whether or not plants found there are indeed this taxon and if they are on National Forest System lands. No substantial threats to *Malacothamnus palmeri* var. *involucratus* from human uses of National Forest System lands have been identified and the species tolerance to both disturbance and fire increases the likelihood that any plants found on National Forest System lands are not being adversely affected by human uses and activities.

Based upon the above analysis *Malacothamnus palmeri* var. *involucratus* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Malacothamnus palmeri* var. *involucratus* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Malacothamnus palmeri* var. *involucratus*.

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Malacothamnus davidsonii

**Malacothamnus palmeri var.
lucianus**

Malacothamnus palmeri var. lucianus

Malacothamnus palmeri (Wats.) Greene var. *lucianus* Kearn (Arroyo Seco bush mallow)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4T1? S1.2 threatened – (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Malacothamnus palmeri var. *lucianus* is endemic to the Santa Lucia Mountains of Monterey County (California Natural Diversity Database 2002). It is positively known from only one location in the area near Hanging Valley, in the upper Arroyo Seco watershed, Los Padres National Forest. Three other occurrences have been reported from near the coast of Big Sur (California Natural Diversity Database 2002) but the identification of these plants is not certain and it also uncertain whether any of these putative occurrences remain extant.

Distribution in the Planning Area

A single occurrence is present on the Los Padres National Forest near Hanging Valley. *Malacothamnus palmeri* var. *lucianus* is documented only from Arroyo Seco (Painter 2004).

Taxonomy and Natural History

Malacothamnus palmeri var. *lucianus* is a dicot in the mallow family (Malvaceae). It is one of three varieties of *M. palmeri* that occur in the southern Central Coast and outer South Coast Ranges (Bates 1993). *Malacothamnus palmeri* var. *lucianus* can be distinguished from the other varieties by hair types and density, bract and bractlet width, calyx size, and inflorescence form (Bates 1993). *Malacothamnus palmeri* var. *lucianus* is a deciduous shrub that blooms May-August (California Native Plant Society 2001).

Status of this taxon may change when revision of the genus *Malacothamnus* is completed (Painter 2004). New information acquired in 2005 suggests that *Malacothamnus palmeri* var. *lucianus* may be a synonym of the var. *palmeri*, not a distinct taxon (Jepson Flora Project 2005). An in depth evaluation of this situation for the *Malacothamnus* varieties involved is needed by the Forest Botanist on the Los Padres National Forest.

Habitat Description

Malacothamnus palmeri var. *lucianus* occurs in chaparral and canyon live oak woodland at elevations of about 2,800 feet (900 meters). It is found on gravel banks and sandstone rocks on west and southwest-facing slopes in full sunlight (California Natural Diversity Database 2002).

Associates include *Adenostoma fasciculatum*, *Salvia mellifera*, *Eriophyllum confertiflorum*, *Umbellularia californica*, *Quercus chrysolepis*, and *Quercus berberidifolia*.

Occurrence Status

A monitoring visit in 2001 (Foster) determined that there are about 129 plants present along the Arroyo Seco Road and that about 30 of these plants were in the roadbed and subject to disturbance from road maintenance activity. In 2002, eight shoots of *Malacothamnus palmeri* var. *lucianus* were collected and transported to Santa Barbara Botanic Garden. The harvested shoots were 'rescued' from the roadbed and were successfully transplanted into the garden to represent a conservation reserve in case a catastrophic event destroys the all or most of the remaining plants found along Arroyo Seco Road. New information (Painter 2004) indicates that this ex situ material that was growing at Santa Barbara Botanic Garden is no longer living.

Threats

Malacothamnus palmeri var. *lucianus* is at risk from road maintenance activities and stochastic events such as landslides.

Conservation and Management Considerations

- Complete an evaluation regarding the new information that *Malacothamnus palmeri* var. *lucianus* may be a synonym of the var. *palmeri*.
- Utilize information from evaluation above to finalize the draft recommendations regarding the *Malacothamnus palmeri* varieties in the 2005 Sensitive list revision.
- Survey National Forest System (NFS) land on the Monterey Ranger District to determine this taxon's status on NFS land.
- Protect all occurrences found on NFS land.
- Avoid fuel treatments in occupied habitat.
- Coordinate road maintenance activities to minimize impacts to *Malacothamnus palmeri* var.

lucianus.

Evaluation of Current Situation and Threats on National Forest System Lands

New information acquired in 2005 suggests that *Malacothamnus palmeri* var. *lucianus* may be a synonym of the var. *palmeri*, not a distinct taxon. This could change the number of occurrences of the *Malacothamnus* varieties involved. An in depth evaluation by the LPNF Forest Botanist of this situation is needed. Until that evaluation is completed, the original information within this account and the threat category assigned in the Draft Environmental Impact Statement will be retained.

Malacothamnus palmeri var. *lucianus* is a very narrow endemic, perhaps known from only a single location, and this location is affected by road use and maintenance.

Based upon the above analysis *Malacothamnus palmeri* var. *lucianus* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	C	D	D	D	C

Malacothamnus palmeri var. *lucianus* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Habitat conditions, i.e., lack of fire, and small population size may result in the loss of the one occurrence on NFS land. Under alternatives 3 and 6 there is a greater probability that prescribed fire would be used to benefit habitat for *Malacothamnus palmeri* var. *lucianus*. The use of prescribed fire in combination with less emphasis on motor vehicle based recreation would likely result in the improvement of habitat conditions under these two alternatives.

Viability Outcomes for All Lands Within the Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	C	D	D	D	C

There is only one established occurrence of *Malacothamnus palmeri* var. *lucianus* and this occurrence is on NFS land. Therefore, the predicted outcomes for all lands do not vary from the predicted outcomes for NFS lands.

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**Malacothamnus palmeri var.
involucratus**

**Malacothamnus palmeri var.
palmeri**

Malacothamnus palmeri var. palmeri

Malacothamnus palmeri (Wats.) Green var. *palmeri* (Santa Lucia bush mallow)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G4T2? S2.2 – threatened (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Malacothamnus palmeri var. *palmeri* is endemic to San Luis Obispo County and possibly Monterey County (California Native Plant Society 2001). Hoover (1970) described the taxon's range as "occasional on rocky slopes in Santa Lucia Mts. from Atascadero-Morro Bay road northward, mostly near summits but occasionally extending down canyons to near the sea, as at Cambria, the type locality."

Distribution in the Planning Area

Malacothamnus palmeri var. *palmeri* is believed to occur on the Los Padres National Forest near Cerro Alto Campground at the north end of the Santa Lucia Ranger District (unpublished data on file at Los Padres National Forest, Painter 2004). However, the plants at this location could be *Malacothamnus palmeri* var. *involucratus* as both species are reported from this location. Painter (2004) also indicates that this taxon is documented from Cuesta Ridge on the LPNF by Hardham. Because this taxon is not positively known to occur on the LPNF, there is a need to obtain information on this location.

Taxonomy and Natural History

Malacothamnus palmeri var. *palmeri* is a dicot in the mallow family (Malvaceae) and is considered a synonym of *Malacothamnus palmeri* by some taxonomic authorities (Hickman 1993).

New information acquired in 2005 suggests that *Malocothamnus palmeri* var. *lucianus* may be a synonym of the var. *palmeri*, not a distinct taxon (Jepson flora Project 2005). An in depth evaluation of

this situation is needed by the the LPNF forest botanist for the *Malacothamnus* varieties involved.

Malacothamnus palmeri var. *palmeri* is a perennial, deciduous shrub that flowers May–July (California Native Plant Society 2001).

Habitat Description

Malacothamnus palmeri var. *palmeri* grows in rocky chaparral at elevations of about 200–1,200 feet (60–360 meters) (California Native Plant Society 2001).

Population Status

There is no occurrence-specific information regarding the status of *Malacothamnus palmeri* var. *palmeri* populations. Taxonomy is also in question in the Cerro Alto location.

Threats

The California Native Plant Society (2001) considers *Malacothamnus palmeri* var. *palmeri* to be at risk in portions of its range due to, in part, altered fire regimes.

Conservation and Management Considerations

- Complete survey work to determine the taxonomic and ecological status of *Malacothamnus palmeri* var. *palmeri* at Cerro Alto and to determine if there are additional occurrences of *Malacothamnus palmeri* var. *palmeri* on the Los Padres National Forest.
- Contact T. Slotta (USDA/ARS) for site information regarding the Cuesta Ridge occurrence and determine if this occurs on NFS lands.
- Complete an evaluation regarding the new information that *Malacothamnus palmeri* var. *lucianus* may be a synonym of the var. *palmeri*.
- Utilize information from evaluation above to finalize the draft recommendation to upgrade this taxon to Sensitive status in the 2005 Sensitive Plant List revision.
- Based on taxonomic status revise the *Malacothamnus palmeri* var. *palmeri* and *Malacothamnus palmeri* var. *lucianus* accounts for later use in biological evaluations on the Los Padres National Forest.

Evaluation of Current Situation and Threats on National Forest System Lands

New information acquired in 2005 suggests that *Malacothamnus palmeri* var. *lucianus* may be a synonym of the var. *palmeri*, not a distinct taxon. This could change the number of occurrences of the *Malacothamnus* varieties involved. An in depth evaluation of this situation by the LPNF forest botanist is needed. In addition, more information is needed on the exact location of the Cuesta Ridge occurrence. Until the evaluation is completed, the original information within this account and the threat

category assigned in the Draft Environmental Impact Statement will be retained.

Based upon the above analysis *Malacothamnus palmeri* var. *palmeri* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Malacothamnus palmeri* var. *palmeri* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Malacothamnus palmeri* var. *palmeri*.

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**Malacothamnus palmeri var.
lucianus**

**Malacothrix saxatilis var.
arachnoidea**

Malacothrix saxatilis var. arachnoidea

Malacothrix saxatilis (Nutt.) T. & G. var. *arachnoidea* (McGregor) E. Williams (Carmel Valley malacothrix)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G5T2 S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Malacothrix saxatilis var. *arachnoidea* is found primarily in the Carmel Valley watershed in Monterey County (Davis, W. S. 1993, California Natural Diversity Database 2002) with a single disjunct occurrence in Santa Barbara County in the San Rafael Mountains. The species occurs throughout Carmel Valley and along Chupines, Conejo, and Tularcitos Creeks as far south as Tularcitos Rancho. Matthews (1997) describes the range as "CV Road from ± Farm Center E to Marble Ranch."

Distribution in the Planning Area

There are two reported occurrences on the Los Padres National Forest. One occurrence [California Natural Diversity Database (CNDDDB) Occurrence #15] is in Monterey County near the Carmel Valley Road along Finch Creek and is reported to be partly within the Los Padres National Forest (California Natural Diversity Database 2002). The second occurrence (CNDDDB Occurrence #6) is on Little Pine Mountain, 8 miles above the Upper Oso gate. The taxonomic status of this second occurrence had been questioned due to the disjunct location of the population, but a collection from this location was recently annotated by Stan Davis as being valid *Malacothrix saxatilis* var. *arachnoidea* (Wilken 2003).

Taxonomy and Natural History

Malacothrix saxatilis var. *arachnoidea* is a dicot in the sunflower family (Asteraceae). It is one of four varieties of *M. saxatilis*. Only one other variety, *M. saxatilis* var. *commutata*, occurs within the same

range as *M. saxatilis* var. *arachnoidea*. The stems and leaves of *M. saxatilis* var. *arachnoidea* are covered with dense, woolly hairs, whereas those of *M. saxatilis* var. *commutata* are smooth to lightly hairy (Davis, W. S. 1993).

Malacothrix saxatilis var. *arachnoidea* is a perennial rhizomatous herb that blooms June through December (California Native Plant Society 2001).

Habitat Description

Malacothrix saxatilis var. *arachnoidea* is found in chaparral and coastal sage scrub habitats on rock outcrops, steep rocky (shale) road cuts, and loose gravelly soil, at elevations of 80–3,400 feet (25-1,215 meters) (California Natural Diversity Database 2002). In Monterey County, *Artemisia californica* and *Baccharis pilularis* are frequent associates. On Little Pine Mountain, *Malacothrix saxatilis* var. *arachnoidea* is found on calcareous soils on a steep south-facing slope (Smith 1998).

Occurrence Status

Population status and trends on National Forest System lands are unknown.

Threats

Malacothrix saxatilis var. *arachnoidea* is distributed in several highly restricted occurrences and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). Road maintenance has the potential to impact *Malacothrix saxatilis* var. *arachnoidea* but so far has not been noted as a concern. Two records in the California Natural Diversity Database (2002) report that *Malacothrix saxatilis* var. *arachnoidea* occurs in areas subject to heavy grazing but that plants did not appear to be affected.

No risks to this species are known on National Forest System lands, and its vulnerability on National Forest System lands appears to be low (Stephenson and Calcarone 1999).

Conservation and Management Considerations

More information is needed on the exact locations and status of occurrences of *Malacothrix saxatilis* var. *arachnoidea* found on the Los Padres National Forest.

Evaluation of Current Situation and Threats on National Forest System Lands

Malacothrix saxatilis var. *arachnoidea* has a disjunct distribution with occurrences found in Monterey and Santa Barbara counties. *Malacothrix saxatilis* var. *arachnoidea* is uncommon, but its rhizomatous habitat protects it from many forms of disturbance and there are no current ongoing activities on National Forest System lands that are known to be adversely affecting the plant.

Based upon the above analysis *Malacothrix saxatilis* var. *arachnoidea* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Malacothrix saxatilis var. *arachnoidea* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Malacothrix saxatilis* var. *arachnoidea* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Malacothrix saxatilis* var. *arachnoidea* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Malacothamnus palmeri var.
palmeri**

**Malaxis monophyllos var.
brachypoda**

Malaxis monophyllos var. brachypoda

Malaxis monophyllos (L.) Sw. var. *brachypoda* (A. Gray) F. Morris and E.A. Eames (White Adder's mouth)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G?T4; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 3-3-1

General Distribution

Malaxis monophyllos var. *brachypoda* is extremely rare in California; it is more widespread in Canada, and NE and Mid-West US, but is still uncommon there, and is considered imperiled across much of its range. The California Natural Diversity Database (2004) lists three occurrences of this species.

Distribution in the Planning Area

All three California occurrences are on the San Bernardino National Forest. Two small populations of *Malaxis monophyllos* var. *brachypoda* occur in and around South Fork Meadows in the San Geronio Wilderness Area. The taxon was presumed to be extinct in California until plants were discovered at this location in 1989 (Coleman 1990). The other recorded occurrence is from the San Jacinto Wilderness Area (reported from Tahquitz Valley in 1922), but may be extirpated from that area (California Natural Diversity Database 2004).

Taxonomy and Natural History

Malaxis monophyllos var. *brachypoda* is a monocotyledon in the orchid family (Orchidaceae). It is the only representative of this genus in California and can be distinguished from other genera in the orchid family by the shape and color of the perianth and by the number and position of the leaves (Wilken and Jennings 1993). *Malaxis monophyllos* var. *brachypoda* is a perennial bulbiferous herb that blooms from June through August (California Native Plant Society 2001).

Malaxis monophyllos var. *brachypoda* is 10-15 cm tall and has a bulb-like caudex. The single leaf is 4-5.5 cm, widely lanceolate to ovate, with a 2-3 cm sheath. The inflorescence is an open 2-6 cm raceme with pedicels under 1.5 mm. The flowers are green to yellow, with the lateral petals more or less equal to the lip, linear, and more or less curved behind the flower. The lip is 1.5-3 mm, triangular, with a cordate base and a beak-like tip. The sepals are 1-2 mm and narrowly lanceolate. The column is less than 1 mm. Fruit are 3.5-5.5 mm (Wilken and Jennings 1993).

Habitat Description

Malaxis monophyllos var. *brachypoda* occurs in wet meadows and shaded places in coniferous forest at elevations of 7,300-9,000 feet (2,225-2,740 meters) (Coleman 1990). It is strongly associated with *Veratrum californicum*. Through the main part of its distribution, this species is strongly associated with fen habitat, often calcareous fens.

Wet meadow habitat is fairly well distributed within the area; however, it tends to occupy small pockets and narrow corridors. There may be specific microhabitats required by *Malaxis monophyllos* var. *brachypoda* that are much more narrowly distributed.

Occurrence Status

There are two known extant occurrences of *Malaxis monophyllos* var. *brachypoda* in California, near South Fork Meadows in the San Geronio Wilderness. Coleman (1990) searched unsuccessfully for the San Jacinto occurrence in late September 1988 although it may have been too late in the year to see plants if they were present. While *Malaxis monophyllos* var. *brachypoda* may be extirpated at this site, there is sufficient extant habitat at Tahquitz Valley to provide hope for rediscovery.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Malaxis monophyllos* var. *brachypoda* (adder's mouth)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1	1	1989	<p>South Fork Meadows, S Fork of the Santa Ana River, San Bernardino Mountains. Plant found in moderate to heavy shade w/in 50 yards of Dry Lake Trail, just below a sharp switchback in the trail. Searched for many years, but not found until 1989 after 4 day search. Silty humps on banks of lilies in marshy area near stream. w/ grasses, <i>Gentiana</i>, <i>Trifolium</i>, <i>Veratrum californicum</i>. Non-maintained trail parallels the stream near the plant. Impacts from hikers and foraging animals are threats. Observed August 5. SBNF-San Gorgonio Wilderness.</p>	SBD
2	0 in 1980-19810 in 1989	1922, 1980-1981	<p>Tahquitz Valley, San Jacinto Mountains. Rare in wet meadow (1922). Meadows heavily grazed and trampled. Has not been rediscovered despite 1980-1981, 1989 surveys. SBNF-San Jacinto Wilderness.</p>	RIV
3	25	1989	<p>South Fork of Santa Ana River, ca. 0.75 mi. N of South Fork Meadows. Meadow area in short grasses and ridges among <i>Veratrum californicum</i>. Foraging animals and occasional hikers in meadow could threaten plants here. Observed August 13. SBNF-San Gorgonio Wilderness.</p>	SBD

- *U* = *Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF* = *San Bernardino National Forest*
- *SBD* = *San Bernardino County*
- *RIV* = *Riverside County*

Threats

Threats to *Malaxis monophyllos* var. *brachypoda* in California include heavy foot traffic and possible equestrian use in and around South Fork Meadows. This is a popular rest stop along a very popular wilderness trail, and is also a very commonly used water source for hikers and equestrians. Accessing water away from trail crossings may be the most serious threat for this species, because it involves off-trail walking/riding through the very narrow band of occupied habitat.

Conservation and Management Considerations

The primary short-term conservation strategy for *Malaxis monophyllos* var. *brachypoda* is to improve the knowledge of its distribution and protect localities where threats are most pronounced. Besides implementing actions recommended for the long term protection of meadow habitat in the SBNF Meadow Habitat Management Guide, the following is a list of conservation practices that should be considered for this species:

- Survey all new occurrences of *Malaxis monophyllos* var. *brachypoda* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Malaxis monophyllos* var. *brachypoda* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior, but only if more than 50 plants are present, and even then using minimal material.
- Map known and new occurrences of *Malaxis monophyllos* var. *brachypoda* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.
- Where this species occurs at/near trails with apparent off-trail impacts in habitat, install protective measures (signs, barriers, etc) as needed to minimize impacts.
- Survey for this taxon as "fens" are identified on the southern CA. national forests.

Evaluation of Current Situation and Threats on National Forest System Lands

Malaxis monophyllos var. *brachypoda* is a rare, narrowly-distributed disjunct, known in California only from the South Fork Meadows area within the San Geronio Wilderness, and a historic record in the San Jacinto Wilderness. This sole known California occurrence is not well protected from identified threats.

Based on the above analysis, *Malaxis monophyllos* var. *brachypoda* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
E	E	E	E	E	E	E

Malaxis monophyllos var. *brachypoda* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The primary ongoing threats to this species are trail use and management, and associated off-trail use near watercourses. Consideration of the Suitable Use restricting motorized and mechanized vehicle travel to Forest Transportation System roads and designated trails, and recreation, wilderness, and riparian area management factor into these outcomes.

This taxon is included in the SBNF Meadow Habitat Management Guide which is assumed would be implemented to the greatest extent practicable under all alternatives. In addition, under all alternatives, Wild and Scenic River eligibility is indicated for the South Fork Santa Ana River.

Under Alternatives 1, 2, 3, 4a and 6, this species would be at continued risk from hiking and equestrian impacts to its attractive streamside habitat at approximately current levels. Under Alternatives 4 and 5, an expected increase in trail use and maintenance, increase risks above current levels. However, under Alternative 4, impacts associated with higher levels of expected recreational use could be offset by expected increases in management control and monitoring.

Because this species known distribution is restricted to two extant records and an historic record, all within existing wilderness areas, the effects of land use zoning on this species are identical across all alternatives.

Viability Outcomes for All Lands Within the Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

The status of this species outside of California was not researched in detail, however, the species is listed as rare and critically imperiled in CA, CO, IL, PA, CT, MA, NH, Saskatchewan, New Brunswick, and Nova Scotia. It is listed as imperiled VT, British Columbia, and Manitoba. The San Bernardino Mountains portion of this species range is such an extreme disjunct, there are not expected to be any effects of decline outside California on the persistence of this species here, or vice versa.

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**Malacothrix saxatilis var.
arachnoidea**

Marina orcuttii var. orcuttii

Marina orcuttii var. orcuttii

Marina orcuttii (S. Watson) Barneby var. *orcuttii* (California marina)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G?T1T2; S1.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-2

General Distribution

Marina orcuttii var. *orcuttii* is found in the Santa Rosa Mountains in interior Riverside County and in the Sierra Juarez Baja California (Barneby 1977).

Distribution in the Planning Area

Two occurrences are known along the Cactus Springs Trail in the Santa Rosa Wilderness Area. The CNDDDB forms from 1976 state one is on the San Bernardino National Forest, and the other is on private property within the National Forest boundary; however current maps of that location do not show private land, so it is now assumed both occurrences are on SBNF lands. These occurrences were last observed on June 01, 1976 (California Natural Diversity Database 2004).

Taxonomy and Natural History

Marina orcuttii var. *orcuttii* is a dicotelydon in the legume family (Fabaceae). This perennial herb blooms between May-October (California Native Plant Society 2001). *Marina orcuttii* var. *orcuttii* is less than 2 dm and often very small. The plant is strigose and generally gray. There are 11-15 leaflets per leaf that are crowded, 2-5 mm, oblanceolate to obovate, folded, and have a large gland at the tip. The inflorescence is 1-2 cm. The corolla is 5-5.5 mm (Isley 1993).

Habitat Description

Marina orcuttii var. *orcuttii* is found in desert montane habitats. It grows on gravelly hillsides in chaparral, pinyon-juniper woodland, and Sonoran Desert scrub (Barneby 1977, California Native Plant Society 2001). *Marina orcuttii* var. *orcuttii* has been found in association with *Agave deserti*, *Krameria parvifolia*, *Prunus fremontii*, and *Aristida fendleriana*.

Occurrence Status

There are only two known occurrences of *Marina orcuttii* var. *orcuttii* in California. They both occur within the Santa Rosa Wilderness less than one mile apart and are near the main hiking trail accessing the area. Population trends for this species are unknown (California Natural Diversity Database 2004; USDA Forest Service 2002).

The table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Marina orcuttii* var. *orcuttii* (California marina)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1976	Cactus Spring Trail just W of Horsethief Creek, Deep Canyon, Santa Rosa Mountains. Growing in rocky soil w/ <i>Agave deserti</i> , <i>Rhamnus ilicifolia</i> , <i>Pinus monophylla</i> , <i>Quercus dumosa</i> , <i>Opuntia phaeacantha</i> , <i>Krameria parvifolia</i> , <i>Aristida fendleriana</i> , <i>Prunus fremontii</i> , <i>Juniperus californica</i> . SBNF. T7S, R6E, SW1/4 Section 7 at 3800 ft.	RIV
2	U	1976	Cactus Spring Trail, 0.25 mi. E of Horsethief Creek, Santa Rosa Mountains. Rocky S-facing slope in weathered granitic soil. Associated w/ <i>Agave deserti</i> , <i>Krameria parvifolia</i> , <i>Prunus fremontii</i> , <i>Aristida fendleriana</i> . SBNF T7S, R5E, SE1/4 section 12, 3650 ft.	RIV

- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *RIV = Riverside County*

Threats

More information is needed about the current status of the two occurrences. Potential impacts to *Marina orcuttii* var. *orcuttii* include dispersed recreation use, and trail maintenance, both within the Santa Rosa Wilderness. In potential habitat west of the wilderness, areas could be affected in the future by land management activities within the Wildland Urban Interface Defense and Threat zones surrounding the Pinyon housing community. Fire suppression actions could also affect habitat.

Conservation and Management Considerations

The following list of conservation practices should be considered for *Marina orcuttii* var. *orcuttii*:

- Due to the paucity of reported sites in the region, all populations should be relocated and protected. Surveys should also be conducted at the same time for *Matelea parviflora*, and *Leptosiphon floribundus* ssp. *hallii*, and other rare species known from the same vicinity along the Cactus Springs Trail in the Santa Rosa Wilderness. Record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Marina orcuttii* var. *orcuttii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Marina orcuttii* var. *orcuttii* in the southern California National Forests using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Marina orcuttii var. *orcuttii* is only known from two occurrences within one mile of each other in the Santa Rosa Mountains in interior Riverside County and in the Sierra Juarez in Baja California (Barneby 1977). Neither Forest occurrence has been observed within the last 29 years, so true threats to this taxon remain unknown.

Based on what is known about this species' distribution and habitat associations, and considering the threat inherent in poor knowledge, *Marina orcuttii* var. *orcuttii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	B	A

Marina orcuttii var. *orcuttii* is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Both locations occur within the San Bernardino National Forest along a trail in the existing Santa Rosa Wilderness, which is also within the newly designated San Jacinto National Monument. The occurrence in T7S, R6E, SW 1/4 Section 7 is also included within the Santa Rosa Game Refuge. The effects from trail use and maintenance are unknown, however presence within the Wilderness and National Monument provide protection against major land disturbing actions.

For the known locations of *Marina orcuttii* var. *orcutti*, the land use zoning and special designations in this location remain the same and do not change by alternative. The habitat for this plant is in rugged country within the existing Santa Rosa Wilderness and there is a potential for other populations of this plant undetected in the area.

Potential habitat to the southwest would be zoned as follows: Alternatives 1, 2, 4, 4a, and 5, Developed Area Interface and Back Country; Alternative 3, Developed Area Interface, Back Country and Recommended wilderness; Alternative 6, Developed Area Interface and Back Country Non-Motorized. Under Alternatives 3 and 4a, the 31 acre Cactus Springs B Wilderness addition farther southwest of occupied habitat would become established.

The emphasis on protecting and enhancing biodiversity under Alternatives 3 and 6 could improve the status of this species by relocating the occurrences, defining threats and protecting occurrences and habitat as necessary.

Viability Outcomes for All Lands Within Range of the axon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
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C	C	B	B	C	C	B
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The known range of *Marina orcuttii* var. *orcuttii* is highly restricted and discontinuous with two small foci in California in the Santa Rosa Mountains in California and in Sierra Juarez close to the boundary (Barneby 1977). The occurrences of *Marina orcuttii* var. *orcuttii* that are known from within the Santa Rosa Wilderness/San Jacinto National Monument boundary receive a high level of protection from major ground-disturbing actions. The extent of habitat protection afforded this species in Baja California is not known; therefore viability may be dependent on NFS management. By maintaining the current distribution of *Marina orcuttii* var. *orcuttii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Marina orcuttii* var. *orcuttii* to suffer a decline in its overall distribution. Viability outcomes are lower for all lands within the range of the taxon due lack of information on habitat threats in Baja, California.

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Matelea parvifolia

Matelea parvifolia (Torrey) Woodson (Spearleaf)

Management Status

Federal: None

California: None

Heritage Rank: G5?; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 3-1-1

General Distribution

Matelea parvifolia occurs in the desert in Riverside, San Bernardino, and San Diego counties. This species also occurs in Arizona, Baja California, Nevada, Texas, and elsewhere (California Native Plant Society 2001). The California Natural Diversity Database (2004) contains ten records for this species. Occurrences are located on the Tubb Canyon, Toro Peak, Corn Spring, Red Cloud Canyon, Cottonwood Spring, Rancho Mirage, Indian Cove, and Kelso USGS quadrangle maps (California Native Plant Society 2001). There is a report from Deep Canyon in western Riverside County (Reiser 1994) as well as one record from Iron Springs Well in San Diego (CalFlora 2002).

In Arizona, *Matelea parvifolia* was collected near Tucson and it has been described as occasional to rare in the South Mountains near Phoenix. This plant is reported to be discontinuous from the eastern Mojave Desert to western Texas. There are 16 specimens of *Matelea parvifolia* from the southeastern peak of Picachos de Santa Clara in Baja California (Reiser 1994).

Distribution in the Planning Area

Matelea parvifolia was found along the Cactus Springs Trail in the Santa Rosa Wilderness of the San Bernardino National Forest in 1977. California Natural Diversity Database (2002) occurrence no. 1 was documented on the San Bernardino National Forest along Cactus Springs Trail near Horsethief Creek.

Taxonomy and Natural History

Matelea parvifolia is a dicotyledon in the milkweed family (Asclepiadaceae). *Matelea parvifolia* is a perennial herb that blooms March–May (California Native Plant Society 2001). It has been found growing on larger shrubs and hedgehog cactus, at the base of rocks, and up through *Agave desertii* and *Ambrosia dumosa* (California Natural Diversity Database 2004).

Matelea parvifolia is a perennial with slender, much branched stems under 0.5m. The leaf blade is 0.5-2 cm and cordate-sagittate. The corolla is greenish or purple, and each sinus has an acute, turned-out tooth. Fruit are more or less 7 cm, with fine longitudinal grooves (Hoffman 1993).

Habitat Description

Matelea parvifolia occurs in rocky areas of Mojavean and Sonoran desert scrub at elevations of 1,444–3,593 feet (440–1,095 meters) (California Native Plant Society 2001). At Plum Canyon, this plant was observed in the crest of a sandy embankment with some shade provided by a fairly well developed shrub cover (Reiser 1994).

Occurrence Status

Matelea parvifolia is found in a small number of occurrences within California, but it is more widespread elsewhere (California Native Plant Society 2001). The California Natural Diversity Database (2004) lists ten occurrences of this species. No data are available on population trends for occurrences on National Forest System lands.

The table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Matelea parvifolia* (Spearleaf)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1977	Cactus Spring Trail near Horsethief Creek. Santa Rosa Mountains. Base of rocks and up through <i>Agave desertii</i> and <i>Ambrosia dumosa</i> . SBNF.	RIV

8	U	1974	Agave Hill, Boyd Deep Canyon Center. East of Hwy 74. 2 collections. Land ownership: University of California.	RIV
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- *U = Unknown*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *RIV = Riverside County*
- *SD = San Diego County*

Threats

No specific threats to *Matelea parvifolia* occurrences have been delineated, but occurrences may be threatened by various recreational activities. This species is naturally rare on the San Bernardino National Forest.

Conservation and Management Considerations

The following list of conservation practices should be considered for *Matelea parvifolia*:

- Due to the paucity of reported sites in the region, all populations should be relocated and protected. Surveys should also be conducted at the same time for *Marina orcuttii* var. *orcuttii* and *Leptosiphon floribundus* ssp. *hallii*, which are also known from the same vicinity along the Cactus Springs Trail in the Santa Rosa Wilderness.
- Survey all new occurrences of *Matelea parvifolia* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Matelea parvifolia* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Matelea parvifolia* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Matelea parvifolia is an uncommon, widely-distributed species, known from one location that was documented in 1977 within the southern California Forests in the Santa Rosa Wilderness along the Cactus Spring Trail. None of the other known occurrence records in the surrounding counties have been recently updated, therefore threats to this species are unknown.

Based on what is known about this species distribution and habitat associations, and considering the

threat inherent in poor knowledge, *Matelea parvifolia* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	B	A

The one location on the Forest occurs along a trail in the existing Santa Rosa Wilderness, which is also within the newly designated National Monument. The effects from trail use and maintenance are unknown. The land use zoning and special designations in this location remain the same and do not change by alternative. The emphasis on protecting and enhancing biodiversity under Alternatives 3 and 6 could improve the status of this species by relocating the occurrence, defining threats and protecting the occurrence and habitat as necessary.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4A	5	6
B	B	A	B	B	B	A

Matelea parvifolia is known from two locations within Joshua Tree National Park and one location in the Anza Borrego State Park. These occurrences, combined with the NFS occurrence in the Santa Rosa Wilderness provide a relatively high level of protection from most major land disturbing actions. By maintaining the current distribution of *Matelea parvifolia* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Matelea parvifolia* to suffer a decline in its overall distribution.

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Marina orcuttii var. orcuttii

**Microseris douglasii ssp.
platycarpha**

Microseris douglasii ssp. platycarpha

Microseris douglasii (DC) Schultz-Bip ssp. *platycarpha* (Gray) Chambers (Small-flowered microseris)

Management Status

Federal: None

California: None

Heritage Rank: G4T2T3, S2S3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4 R-E-D Code 1-1-2

General Distribution

Microseris douglasii ssp. *platycarpha*, Small-flowered microseris occurs in cismontane southwestern California, the south Channel Islands, and Baja California (Chambers 1993).

Distribution in the Planning Area

Microseris douglasii ssp. *platycarpha* occurs within the Cleveland National Forest in the San Mateo Canyon Wilderness and in the Agua Tibia Wilderness. It occurs adjacent to the CNF on the Santa Rosa Plateau (CalFlora 2000).

Taxonomy and Natural History

Microseris douglasii ssp. *platycarpha* (Asteraceae) is an annual herb that blooms March–May (CNPS 2001). It is one of three varieties of Douglas' Microseris that occur in California (Chambers 1993). *Microseris douglasii* ssp. *platycarpha* is distinguished from varieties *douglasii* and *tenella* on the basis of length of the fruit and pappus scales.

Stems of this scapose annual are 5-60 mm, with mostly basal leaves 3-25 cm. Inflorescence 5-100+ flowered, involucre 7-16 mm, outer phyllaries deltate, with flower ligules yellow or white. Fruit 3-4.5 mm, widest at tip; pappus scales generally 2-7 mm and generally larger than the fruit, becoming curved and more or less inrolled, bristles 1-4 mm (Chambers 1993).

Habitat Description

Microseris douglasii ssp. *platycarpha* occurs on clay soils near vernal pools in cismontane woodlands, coastal scrub, and valley and foothill grassland below 3,500 feet (1,070 meters) (CNPS 2001).

Occurrence Status

Occurrences on the National Forest System lands are known from the Cleveland National Forest in the San Mateo Canyon Wilderness and in the Agua Tibia Wilderness (CalFlora 2002). CNPS categorizes *Microseris douglasii* ssp. *platycarpha* as a List 4 species and considers it too common to keep current occurrence records in the California Natural Diversity Database for List 4 plants. As this taxon is known to occur in precipitation dependent, ephemeral vernal pool ecosystems, population trends vary greatly from year to year (Reiser 1994).

Threats

Urban development may contribute to the decline of *Microseris douglasii* ssp. *platycarpha* in southern California (Reiser 1994). There are no known threats to the occurrences on the Cleveland National Forest that are in established Wilderness areas, as there are few visitors and little to no Forest management activities within Wilderness areas.

Conservation and Management Considerations

No conservation measures are necessary on NFS lands for *Microseris douglasii* ssp. *platycarpha* at this time.

Evaluation of Current Situation and Threats for National Forest Systems Lands

On National Forest System lands, *Microseris douglasii* ssp. *platycarpha* is known only from within established Wilderness areas in the Cleveland National Forest. No threats to the taxon have been identified from Forest Service activities. CNPS categorizes *Microseris douglasii* ssp. *platycarpha* as a List 4 species and considers it too common to keep current occurrence records in the California Natural Diversity Database for List 4 plants.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Microseris douglasii* ssp. *platycarpha* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Microseris douglasii* ssp. *platycarpha* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Mimulus clevelandii

Mimulus clevelandii Bdg. (Cleveland's bush monkeyflower)

Management Status

Federal: None

California: None

Heritage Rank: G2G3, S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4 R-E-D Code 1-1-2

General Distribution

Cleveland's Bush Monkeyflower is found in the Peninsular Ranges of Orange, Riverside, and San Diego counties (California Native Plant Society 2001, Thompson 1993) and Baja California, Mexico (Reiser 1994).

Distribution in the Planning Area

Cleveland's Bush Monkeyflower has been collected in the Santa Ana Mountains, the Laguna Mountains, and other locations on or adjacent to the Cleveland National Forest (CalFlora 2000).

Taxonomy and Natural History

Cleveland's Bush Monkeyflower is a showy herbaceous perennial from a woody base that blooms May–July (California Native Plant Society 2001). This member of the Figwort family (Scrophulariaceae) hybridizes with *Mimulus aurantiacus* at lower elevation. The hairy 16-36 inch stems often exhibit clusters of smaller leaves at the main leaf axis. Lanceolate to oblong leaves (8-39 inch) generally have a rolled under margin with a hairy upper surface. Flowers are pediceled (0.2 inch) below a swollen calyx, which narrows above the ovary and has two unequal acute to acuminate lobes (0.2-0.4 inch). Persistent corollas are yellow with a 1.4 – 1.6 inch tube throat (Thompson 1993).

Habitat Description

Cleveland's Bush Monkeyflower grows in chaparral and lower montane coniferous forest, often in disturbed areas and in open borders of woodlands, at elevations of 3,000–6,600 feet (915–2,000 meters) (Thompson 1993; California Native Plant Society 2001).

Occurrence Status

Winter (pers. comm.) considers this species common-to-abundant on nearly every gabbro peak in the southern districts of the Cleveland National Forest, including Black Mountain, El Cajon Mountain, Viejas Mountain, and Guatay Mountain. As Cleveland's Bush Monkeyflower occurs on gabbro outcroppings within the Forest, historical occurrence of this species has not been documented due to abundant population representation. Recent Cleveland National Forest records confirm statements made by Winter (pers. comm.).

OCCURRENCE DATA of *Mimulus clevelandii* (Cleveland's bush monkeyflower) on National Forest lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
*	*	U	2001	Poser Mountain / CNF	SD
*	*	U	2001	Poser Mountain / CNF	SD
*	*	U	2001	Barber Mountain / CNF	SD
*	*	U	2001	Barber Mountain / CNF	SD
*	*	U	2001	Corral Canyon / CNF	SD
*	*	U	1990	Santa Ana Mountains, East Fork, Upper Long Canyon / CNF	O / RIV

- U = Unknown
- * = an occurrence number has not been assigned
- CNF = Cleveland National Forest
- O = Orange County
- RIV = Riverside County

- SD = San Diego County

Threats

Mimulus clevelandii may be threatened by recreational activities (California Native Plant Society 2001), including illegal OHV use and shooting areas.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Mimulus clevelandii*:

- Monitor existing populations to better evaluate potential recreation related threats.

Evaluation of Current Situation and Threats for National Forest Systems Lands

Mimulus clevelandii apparently occurs in abundance on several gabbro peaks within the Cleveland National Forest. Recreational activities are the only major potential threat identified. The occurrence at Corral Canyon may be affected by OHV use, as there is OHV use in this vicinity. Other occurrences are not likely to be substantially threatened by Forest Service activities.

Based upon the above analysis this species has been assigned the following risk category:

4. Uncommon in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Mimulus clevelandii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Mimulus clevelandii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

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Personal communication

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**Microseris douglasii ssp.
platycarpa**

Mimulus diffusus

Mimulus diffusus

Mimulus diffusus Grant (Palomar monkeyflower)

Management Status

Federal: None

California: None

Heritage Rank: G4Q, S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4 R-E-D Code 1-1-1

General Distribution

Palomar Monkeyflower occurs primarily from the Santa Ana and San Jacinto Mountains, in Orange, Riverside and San Diego counties, south to Baja California, Mexico (Munz 1974). Occurrences have also been recorded in the Sierra Nevada foothills, the Tehachapi Mountains, western Mohave, outer South Coast Ranges, and in Monterey and San Bernardino Counties (CalFlora 2002; Reiser 1994).

Distribution in the Planning Area

Palomar Monkeyflower populations have been observed from the Santa Ana Mountains on the Cleveland National Forest (Boyd and others 1995) and are common in the Laguna and Palomar Mountains and adjoining state parks (Winter pers. comm.). It occurs on the San Bernardino National Forest in the San Jacinto Mountains (Dudek and Associates 2000), and in the San Bernardino Mountains, in the vicinity of Baldwin Lake (CalFlora 2002).

Taxonomy and Natural History

Palomar Monkeyflower is an annual herb that blooms April–June (California Native Plant Society 2001). Plants are glandular pubescent with widely diffused, much branched stems of .5-2.5 dm tall. Leaf blades are oblong lanceolate, entire to deeply and doubly dentate-lobed, 1-1.5 cm long, and sessile. Pedicels are 25-45 mm long. Calyx is 5-7 mm long, ridged or slightly wing-angled, lobes 0.5-1 mm, rounded-ovate, mucronate, and ciliate. Corolla is 12-15 mm long, purple, throat campanulate, ventrally with 2 yellow pubescent sharp ridges and proximally with a considerable yellow area, the orifice open, lobes spreading, notched, and proximally pilose. Anthers are glabrous, stigmas fringed, and capsules are

6 mm, dehiscing slightly through septum-apex (Abrams 1951).

Mimulus diffusus is similar to *M. palmeri*. Thompson (1993) does not recognize Palomar Monkeyflower as a separate species. Abrams (1951) described *M. palmeri* with pubescent anthers and *M. diffusus* with glabrous anthers and distinguishes these two species on this characteristic. The California Native Plant Society retains the distinction between the two species (CalFlora 2002; California Native Plant Society 2001).

Habitat Description

Mimulus diffusus species grows in sandy or gravelly soils of chaparral and lower montane coniferous forest, at elevations of 4,000–6,000 feet (1,220–1,830 m) (California Native Plant Society 2001). It also occurs in sandy washes and disturbed areas near roads and trails (Dudek and Associates 2000).

Occurrence Status

Within National Forest System lands *Mimulus diffuses* is reported from the Cleveland and San Bernardino National Forests. Occurrences on the Cleveland National Forest are reported from Shrine Camp, Santa Ysabel/Witch Creek, Boulder Creek, Pine Valley, Lost Valley, Corte Madera, Dripping Springs, and Oak Grove. Additional locations in San Diego County reported by (Reiser 1994) not on National Forest System lands include Cuyamaca Rancho State Park, Merrigan Ranch, Agua Caliente Creek in wet sand near Warner's Hot Springs, McCain Valley, Lark Canyon near Live Oak Spring, Morena Lake, a meadow at the foot of Morgan Hill in the Palomar Mountains, at Echo Dell, a burn between Campo and Canyon City, at the Silverwood Wildlife Sanctuary near Barona, Airplane Ridge in the Cuyamaca Mountains, the hills above Lake Wohlford, Tecate Mountain, and at Oakcrest Park in Encinitas.

Reiser (1994) also reports occurrences in Riverside County known from Kenworthy Station in Garner Valley and near Santa Rosa Mountain Road, Colt Road and De Portola Road, near Calle Azur and Glen Oak Valley Road, and just east of the CNF Dripping Springs Fire Station, the Santa Rosa Plateau. It has also been reported in the vicinity of Trabuco Peak in Orange County (Reiser 1994).

Populations referenced above from Reiser (1994) are listed in synonymy with *Mimulus palmeri* as described by Thompson (1993). Actual occurrences of *Mimulus diffusus* may be fewer if *M. diffusus* is determined to be distinct from *M. palmeri*.

Threats

General threats to this taxon include increased recreational activity; trail maintenance activities, and urbanization of natural areas (Reiser 1994).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Mimulus diffusus*:

- Map and document occurrences on National Forest System lands.
- Monitor occurrence status and population trends and distinguish from *M. palmeri*.
- Consider adding to the Regional Forester's sensitive plant species list if the suspected abundance is confirmed to be more *M. palmeri*, instead of *M. diffusus*.

Evaluation of Current Situation and Threats for National Forest Systems Lands

There is taxonomic disagreement about the status of *Mimulus diffusus*; it may or may not be distinct from *M. palmeri*. In any case, it appears to be widely distributed through the planning area, though there is no indication of how abundant it is at each location. Specific threats to this taxon from Forest Service activities have not been clearly identified.

Based upon the above analysis this species has been assigned the following threat category:

3. Widespread in Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Mimulus diffusus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Mimulus diffusus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Personal communication

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Mimulus clevelandii

Mimulus exiguus

Mimulus exiguus

Mimulus exiguus A. Gray (San Bernardino Mountains monkeyflower)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-2

General Distribution

Mimulus exiguus is known from occurrences in Big Bear and Holcomb valleys in the northern San Bernardino Mountains in San Bernardino County (California Natural Diversity Database 2004, University of California Riverside Herbarium, Rancho Santa Ana Botanic Garden herbarium). There is one additional population in this area near Bluff Lake that has not yet been entered into the database. Another population may occur in the Sierra Juarez in Baja California Norte, Mexico, but this occurrence needs verification (California Native Plant Society 2001).

Distribution in the Planning Area

There are thirteen occurrences of *Mimulus exiguus* in the California National Diversity Database, seven of which occur on the San Bernardino National Forest. Additional occurrences are noted from collections housed at the University of California Riverside Herbarium (UCR) and Rancho Santa Ana Botanic Garden (RSA). Some of these also occur on the San Bernardino National Forest. All known occurrences are found around Big Bear and Holcomb valleys and near Bluff Lake. Occurrences are known from the Big Bear Lake, Holcomb Valley, Sawmill, North Baldwin Lake, and South Baldwin Ridge/Erwin Lake pebble plain complexes (USDA Forest Service 2002a).

Taxonomy and Natural History

Mimulus exiguus is a dicotyledon in the lopseed family (Phrymaceae) (APGII 2003). Out of 150 species, it is the smallest monkeyflower in the world (Krantz 1990), and is commonly referred to as eye-strain monkeyflower. There are more than 60 recognized species of *Mimulus* native to California, and *M.*

exiguus is distinguished by its small size, pedicel length, deciduous corolla, and calyx length (Thompson 1993). *Mimulus exiguus* is a diminutive annual herb that blooms from June through July (California Native Plant Society 2001).

Mimulus exiguus is a 2-10 cm annual that is minutely puberulent. The leaves are 2-8 mm, narrowly elliptic to narrowly ovate and are not sheathing at the stem. The flower pedicel is 6-20 mm, ascending in fruit. The calyx is 2-3.5 mm, more or less glabrous, with acute, minutely puberulent, equal lobes 0.5-1 mm. The corolla is lavender, the tube-throat is 2-3.5 mm, and the placentas are axile. Fruit are 3-4 mm, nearly spheric, and greater than the calyx (Thompson 1993).

Habitat Description

Mimulus exiguus occurs in meadows, vernal seeps, and springs within montane coniferous forests, at elevations between 5,850–7,524 feet (1,800–2,315 meters) (California Native Plant Society 2001, California Natural Diversity Database 2002). It also occurs on the fringes of pebble plains where vernal seeps/springs or meadows border pebble plain habitat. Microhabitats include gentle slopes along streamlets and runoff areas in clay soils (Thompson 1993). Little is known about the ecological requirements of this species; however, observations indicate that it may tolerate limited disturbance. Natural disturbances by stream sedimentation, erosion, and frost heave cycles may be important components of the habitat for this species (USDA Forest Service 2002b).

Occurrence Status

Occurrence data for the population in Sierra Juarez in Baja California Norte, Mexico, is not known. In the United States, habitat for *Mimulus exiguus* is narrowly distributed within the northern San Bernardino Mountains. On the San Bernardino National Forest, measures have been taken to protect and restore pebble plain and meadow habitat to conserve federally listed species. These measures offer protection for *Mimulus exiguus* where it co-occurs with listed taxa. Since the late 1980s road densities within habitat have been a concern. Since that time, numerous roads within pebble plain habitat have been decommissioned. Developed recreational sites and Forest system trails constructed in the past, on or near pebble plain habitat, have also degraded habitat for *Mimulus exiguus*. Although impacts could not be entirely eliminated, barriers and signs have been installed to direct recreational use within the footprint of the sites and to educate the public as to why these measures are needed. Special use events previously located in habitat have also been relocated or the events have been modified to eliminate effects. The designation of specific locations for target shooting and closure of the Mountaintop District on the SBNF to dispersed shooting has also reduced impacts to this species. Ongoing conservation measures include suppression and eradication of invasive non-native species to the maximum extent possible from areas occupied by special-status plants and immediate repair of unauthorized routes, regular monitoring, restoration efforts, and public education (U.S. Fish and Wildlife Service 2001, USDA Forest Service 2002b). This taxon also receives protection as actions are implemented in the SBNF Pebble Plain and Meadow Habitat Management Guides.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Mimulus exiguus* (San Bernardino Mountains monkeyflower)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	200	1981	Near water tanks, 0.5 mi. S of town of Sugarloaf. Vernal moist clay w/ Saragosa quartzite cobbles, fed by spring. w/ <i>Castilleja lasiorhyncha</i> . Off-road vehicle damage to spring area. SBNF.	SBD
2	U	1980	E of town of Sugarloaf, both sides of Tennis Ranch Rd. Vernal seep associated with <i>Mimulus purpureus</i> . PVT in SBNF, proposed for development.	SBD
3	U	1984	SE end of Metcalf Bay, Big Bear Lake. Small drainage w/ <i>Sidalcea pedata</i> and other sensitive plant spp. PVT in SBNF. Area used as Presbyterian conference grounds.	SBD
4	U	1987	N Baldwin Lake unit of Big Bear Valley Preserve system. Pebble plain bordering a spring. Population limited to area of low competition with other spp. Associated with many pebble plain spp. Feral burros, off-road vehicles, woodcutting, and quartzite collecting are threats. TNC, PVT.	SBD

5	U	1979	E part of Arrastre Flat. At seep near stream. w/in significant acreage of pebble plains crossed by annual creeks. w/ large population of <i>Castilleja lasiorhyncha</i> and 10 other sensitive spp. Incl. former occ. #6. SBNF.	SBD
7	U	1978	NW part of Arrastre Flat. SBNF.	SBD
8	U	1980	ca. 0.25 mi. E of marsh S of Baldwin Lake, just S of jeep road. Vernal seep w/ <i>Castilleja lasiorhyncha</i> . Mapped w/ several other rare plant spp. SBNF.	SBD
10	U	1980	Upper Holcomb Valley, from spring near Belleville to 0.5 mi. SW from campground. w/ <i>Phacelia curvipes</i> on granitic soil beneath <i>Pinus ponderosa</i> . Also in vernal moist depression. 14 other sensitive plant spp. found in area. SBNF.	SBD
11	U	1978	ca. 1.0 mi. S of Hitchcock Ranch, Holcomb Valley; < 0.2 mi. W of Old Baldy Council Camp; 0.7 mi. W of Bertha Peak. Incl. former occ. #12, 14, 15, 16. SBNF.	SBD
17	U	U	Fawnskin Valley, San Bernardino Mtns. PVT in SBNF.	SBD

19	U	1980	Harry Spring, along Coxey Rd., Hanna Flat. w/ <i>Castilleja lasiorhyncha</i> in vernal moist area in Jeffrey pine forest. May have been affected by Old Fire dozer line in 2003, unsure at this time 2005 (Kopp). SBNF.	SBD
20	U	1984	Just E of Eagle Point, S shore of Big Bear Lake, near lakeshore. Meadow vulnerable to trespass and off-road vehicle damage. Vegetation includes <i>Pinus jeffreyi</i> , <i>Mimulus purpureus</i> , <i>Sidalcea pedata</i> , <i>Thelypodium stenopetalum</i> , 12 other sensitive spp. PVT.	SBD
21	U	1984	Castle Glen area, Big Bear Lake. w/ <i>Phlox dolichantha</i> and other sensitive spp. Conservation easement over 124 acres conveyed to TNC and has been fenced. Other private parcels unprotected. PVT.	SBD
*	> 300	2000	Jct. of Mill Creek Rd., 2N86, and 2N10.2. Sagebrush community surrounding a dry drainage w/ <i>Artemisia</i> sp., <i>Chrysothamnus nauseosus</i> , <i>Ceanothus</i> sp., <i>Arctostaphylos patula</i> , <i>Salvia dorrii</i> , <i>Salix</i> sp., grasses. Xeric to moist sand. No visible disturbance in 2000, however in 2003, dozer line was created adjacent to this site in Old Fire. From map and survey, habitat appears to not be affected but needs survey in spring 04, remains unknown in 05 (Kopp). SBNF.	SBD

*	U	1979	W edge Arrastre Flat in drainage way (Thorne/UC/Jeps) SBNF	SBD
27059 (UCR)	U	1978	Holcomb Valley, 3N, R1W, S35 7400 ft. annual creek on clay soil growing with <i>M. androsaceus</i> , <i>M. suksdorfii</i> , <i>M. pilosus</i> , <i>M. purpureus</i> , and <i>M. guttatus</i> within 20 m. July 13. Ownership U. (Krantz/UCR) Ownership:U	SBD
20133 (UCR)	U	1978	Holcomb Valley, in drainage of Saragosa Spring crossing 3N16 ca 0.2 mi W of junction with 3N02. (Krantz/UCR) SBNF	SBD
15914 (UCR)	U	1979	Ca. 3 mi W of dump N of Baldwin Lk where first rd leads NW to Burnt Flat beside 3N16 (Clark/UCR) SBNF	SBD
54619 (UCR)	U	1983	Big Bear Valley, restricted to small vernal creek on Castle Glen Preserve, Big Bear Lake. T2N R1E, S16. 6900 ft. (Krantz/UCR) pvt. TNC	SBD
20125 (UCR)	U	1979	Big Bear Lake near lakeshore at Eagle Point. Site about to be developed for condominiums. A small patch ca. 10 m across. T2N, R1E, S17. (Krantz/UCR)	SBD
20131 (UCR)	U	1979	Holcomb Valley. W meadow edge of Hitchcock Ranch growing along annual creek free of much competition from taller meadow veg. T3N, R1W S36. (Krantz/UCR) Pvt	SBD

20134 (UCR)	U	1978	Holcomb Valley, 3N04, just N of Arrastre Flat. T3N, R1E, S27. (Krantz/UCR) SBNF	SBD
20126 (UCR)	U	1979	Spring N of Baldwin Lake, W of 3N16, N of Hwy 18. T2N, R2E, S6. Pavement plain bordering spring, one small population. Population limited to area of low competition from other species. (Krantz/UCR) Ownership: CDFG	SBD
670142 (RSA)	U	1998	Pebble plain S of Sugarloaf development. Southern terminus of Maple St., 100 m S on dirt rd. 7300 ft. elev. Clay margins of dirt road and vernal depressions with <i>M. androcaceus</i> , <i>M. suksdorfii</i> and <i>M. rubellus</i> . (Schoenig/UCR) SBNF	SBD
54612 (UCR)	U	1981	San Bernardino Mts., S. of Sugarloaf, E. of Moonridge, T2N/R1E/S25, 7300 ft.	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *TNC = The Nature Conservancy*
- *SBD = San Bernardino County*

Threats

On National Forest System lands, *Mimulus exiguus* populations are declining due to increased recreational use, prospecting, existing roads and trails bisecting habitat, and unauthorized vehicle use off designated roads. Management of vegetation to remove fuels within the Wildland Urban Interface also has the potential to affect habitat over the long term as openings are created and unauthorized motorized use becomes harder to control. Fire suppression activities also threaten habitat, especially dozer construction of fuelbreaks during emergency situations. Despite these impacts, the rate of habitat decline on the Forest has decreased due to recent and ongoing habitat protection measures described above.

On private land, development continues to impact or remove habitat. The other reported population in the Sierra Juarez in Baja California Norte, Mexico, has not been recently verified, threats there are unknown.

Conservation and Management Considerations

The following list of conservation practices should be considered for *Mimulus exiguus*:

- Implement conservation measures in the SBNF Meadow and Pebble Plain Habitat Management Guides to the greatest extent practicable.
- Prepare a Habitat Management Guide for vernal wetlands on the SBNF, including mesic swales, seeps and springs that addresses *Mimulus exiguus* habitat.
- Survey all new occurrences of *Mimulus exiguus* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Mimulus exiguus* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Mimulus exiguus* in the plan area area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Mimulus exiguus is a rare, narrowly-distributed species that is endemic to Big Bear and Holcomb Valley's in the San Bernardino Mountains. The primary threats to this species are prospecting, unclassified trail construction and use, dispersed recreation use, nonnative invasive species, road use and management, fire suppression actions that create intense ground disturbance or alter water flow, and other actions that would alter hydrological regimes. Based on the above analysis, *Mimulus exiguus* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	A	C	B	D	A

Mimulus exiguus is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The viability of this species is primarily tied to protection and management of meadow, vernal wetland and pebble plain habitat. With implementation of the SBNF Meadow Habitat Management Guide (USDA Forest Service 2002b) and the Pebble Plain Habitat Management Guide (USDA Forest Service 2002a) viability for this species on NFS lands would be improved. Some occurrences of *Mimulus exiguus* are present within the existing Holcomb Valley/North Baldwin Lake Special Interest Area (SIA). This designation would remain under all alternatives, however under Alternatives 2-6, occurrences within this SIA would receive a higher level of protection due to Standard S33. The Suitable Use restricting motorized and mechanized vehicle travel to Forest System roads and designated trails, along with Standards regarding rare species management, recreation, riparian area, and mining management was also considered when predicting the outcomes.

The majority of ongoing and expected impacts to this species occur in Back Country (BC) and Developed Area Interface (DAI) zones. Under Alternatives 1, 2, 3, 4 and 4a, this species would be at continued risk from ongoing impacts to its habitat at approximately current levels. Under Alternative 1, where occurrences overlap with listed species, *Mimulus exiguus* would benefit from conservation measure direction under the Southern California Conservation Strategy, however there would be no special area designations recommended under this alternative. The primary theme of Alternative 2 is to maintain biological diversity and ecological integrity while accommodating a gradual increase in recreation opportunities and this would be expected to benefit the species. Under Alternatives 4 and 4a, impacts associated with higher levels of expected recreational use would be minimized by expected increases in management control and monitoring. Effects would be lower in Alternative 4a due to a portion of the habitat occurring within a Back Country Motorized Use Restricted zone. In addition, the emphasis in this alternative is to sustain the setting through management of dispersed recreation and to maintain or expand existing facilities prior to constructing new ones at a low rate. Under Alternative 5 there would be increased threats as a result of an increase in Back Country zoning across the range of the species, an expected increase in road and trail construction and use, and potential for additional water diversions/extractions. There would be no special area designations recommended under Alternative 5. Under Alternative 6, threats would decrease as a result of an increase in Back Country Non-Motorized and Back Country Motorized Use Restricted zoning across the range of the species, and no expected increase in road and trail construction.

Preparation of a Habitat Management Guide to address this species would be expected to have a higher priority and happen sooner under Alternatives 2, 3, 4, 4a and 6. The response time and effectiveness of impact identification and management would be expected to be higher under Alternatives 3 and 6. The recommendation to establish the candidate Arrastre Flat Research Natural Area under Alternatives 2, 3, 4a, and 6 would provide a higher level of protection for a small portion of the species range.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	C	D	B

One location at Castle Glen is protected under a conservation easement. The private lands of Big Bear Valley have been highly reduced and fragmented by residential and commercial development. The remaining fragments continue to be lost as continued development occurs. As development, the demand for water and new diversions/extractions also increases. The majority of the distribution of this taxon occurs on National Forest System lands on the SBNF. While it is presumed that this species continues to lose habitat to private land development, this loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF.

By maintaining the current distribution of *Mimulus exiguus* on National Forest System lands under Alternatives 1-4a, and 6, only Alternative 5 would be expected to contribute substantial adverse cumulative effects that would cause this species to suffer a decline in its overall distribution. This would occur due to the increase of motorized land use zoning across the range of the species, the potential for increased water extraction and no opportunity to protect habitat through Special Area designation. Occurrences are expected to be affected on private land over time due to development or maintenance of existing facilities across all alternatives.

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Mimulus diffusus

Mimulus purpureus

Mimulus purpureus

Mimulus purpureus A.L. Grant (Purple monkeyflower)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-2

General Distribution

Mimulus purpureus occurs in Big Bear and Holcomb valleys in the San Bernardino Mountains and the Sierra San Pedro Martir of Baja California, Mexico. There are no known occurrences between these widely separated geographic areas (California Natural Diversity Database 2004, Thompson 1993).

Distribution in the Planning Area

Of the 12 recorded occurrences of *Mimulus purpureus* in the California Natural Diversity Database, three are on the San Bernardino National Forest however not all known occurrences are recorded in the database. Additional occurrences are noted from collections housed at the University of California Riverside Herbarium (UCR) and Rancho Santa Ana Botanic Garden (RSA). Some of these also occur on the San Bernardino National Forest. There is one record from Snow Valley. *Mimulus purpureus* occurs on the Big Bear Lake, Holcomb Valley, Fawnskin, Sawmill, and North Baldwin Lake pebble plain complexes (USDA Forest Service 2002a).

Taxonomy and Natural History

Mimulus purpureus is a dicotyledon in the lopseed family (Phrymaceae) (APGII 2003). Several varieties of this species have been proposed, but they do not appear to warrant recognition (Thompson 1993).

Mimulus purpureus is an annual herb that blooms May–June (California Native Plant Society 2001).

Mimulus purpureus is a 0.5-7 cm puberulent annual. The elliptic to ovate leaves are 3-16 mm. The flower pedicel is 15-56 mm, the calyx is 4-8 mm, the tube is puberulent, and the lobes are equal, 0.5-1

mm, rounded to truncate, with a small point at the tip, and glabrous. The corolla tube-throat is 8-13 mm, and there are two lips. The upper lip is red-purple, and the lower lip is rose. The limb is 8-10 mm wide, and the placentas are axile. Fruit are 4-7 mm (Thompson 1993).

Because *Mimulus purpureus* is an annual species, it exhibits high variation from year to year according to climatic conditions.

Habitat Description

Mimulus purpureus inhabits dry areas bordering meadows in Jeffrey pine forest, pinyon-juniper woodland and vernal seeps at elevations of 6,175–7,400 feet (1,900–2,300 meters) (California Native Plant Society 2001). It also occurs on the edges of pebble plains where moist, sandy openings, seeps or dry margins of meadows occur adjacent to pebble plains. *Mimulus purpureus* does not generally occur under closed canopy of taller vegetation (Krantz 1980). This species often occurs with other annual *Mimulus* species, including *M. androsaceus*, *M. exiguus*, and *M. suksdorfii*. Other associates include federally-listed species such as *Castilleja cinerea* and *Sidalcea pedata*, and sensitive species such as *Linanthus killipii*, and *Castilleja lasiorhyncha*.

Habitat for *Mimulus purpureus* is narrowly distributed within the planning area and is affected by recreational activities and other Forest uses. However, efforts to preserve federally listed plant species through protection of remaining pebble plain and meadow habitat will also benefit *Mimulus purpureus* (USDA Forest Service 2002a, 2002b).

Occurrence Status

No information is known on status of the occurrences in the Sierra San Pedro Martir of Baja California, Mexico.

There are twelve reported occurrences of *Mimulus purpureus* (California Natural Diversity Database 2002) and numerous unreported occurrences throughout Bear and Holcomb Valleys. At least one historic occurrence has been extirpated from the construction of Big Bear Lake. Two occurrences were held, at least in part, by The Nature Conservancy, then transferred to Natural Heritage Foundation, and currently the conservation easements are again in transition. Occurrences vary greatly, ranging from 10 to 2000 individuals. High year-to-year variation within individual occurrences is also expected since *Mimulus purpureus* is an annual species.

On the San Bernardino National Forest, measures have been taken to protect and restore pebble plain and meadow habitat to conserve federally listed species. These measures offer protection for *Mimulus purpureus* where it co-occurs with listed taxa. Since the late 1980s road densities within habitat have been a concern. Since that time, numerous roads within pebble plain habitat have been decommissioned. Developed recreational sites and Forest system trails constructed in the past, on or near pebble plain habitat, have also degraded habitat for *Mimulus purpureus*. Although impacts could

not be entirely eliminated, barriers and signs have been installed to direct recreational use within the footprint of the sites and to educate the public as to why these measures are needed. Special use events previously located in habitat have also been relocated or the events have been modified to eliminate effects. The designation of specific locations for target shooting and closure of the Mountaintop District on the SBNF to dispersed shooting has also reduced impacts to this species. Ongoing conservation measures include suppression and eradication of invasive non-native species to the maximum extent possible from areas occupied by special-status plants and immediate repair of unauthorized routes, regular monitoring, restoration efforts, and public education (U.S. Fish and Wildlife Service 2001, USDA Forest Service 2002b). This taxon also receives protection as actions are implemented in the SBNF Pebble Plain and Meadow Habitat Management Guides.

The table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Mimulus purpureus* (Purple monkeyflower)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1980	E of town of Sugarloaf, both sides of Tennis Ranch Rd., San Bernardino Mtns. Vernal seep associated with <i>Mimulus exiguus</i> . Proposed for development. PVT.	SBD
2	U	1926	S shore of Big Bear Lake, from 0.4 mi. SW of Stanfield Cutoff W to Eagle Point. Disturbed places near lakeshore. Incl. former occ. #15, 24. PVT.	SBD
3	U	198U	Big Bear City, near E end of Pioneer Lane and along Hwy 18. Several rare spp. in the Pan Hot Springs area. PVT.	SBD
4	U	1953	Big Bear Lake Post Office. Open <i>Pinus jeffreyi</i> forest. Land owner: U.	SBD

5	U	U	Between Arrastre Flat and Union Flat, San Bernardino Mtns. w/in significant acreage of pebble plains crossed by annual creeks. Associated w/ largest populations of <i>Mimulus exiguus</i> and <i>Castilleja lasiorhyncha</i> . 9 other sensitive spp. Incl. former occ. #6. SBNF.	SBD
7	U	1953	SE of Baldwin Lake, San Bernardino Mtns. Open Jeffrey pine forest. PVT.	SBD
8	1000+ in 2000	1984, 2000	Holcomb Valley area. Unprotected from vehicle use off designated roads. Incl. former occ. # 9, 10, 13, 14. Boy Scouts/SBNF.	SBD
11	U	1984	Upper Holcomb Valley. Possibly decreasing due to vehicle use off designated roads. Associated with sensitive pebble plain spp. SBNF.	SBD
16	U	1901	Grout Creek, near Fawnskin. Extirpated. Now inundated by Big Bear Lake.	SBD
27	U	1984	Presbyterian Conference grounds, S shore of Big Bear Lake. Associated w/ <i>Sidalcea pedata</i> . Near small drainage with sensitive meadow spp. on either side of main road. PVT in SBNF.	SBD

28	U	1984	Castle Glen area, Big Bear Lake. Associated w/ <i>Phlox dolichantha</i> , other sensitive spp. Conservation easement over 124 acres conveyed to TNC (now NHF) and has been fenced. Other private parcels unprotected. NHF, PVT.	SBD
29	U	1984	N and W of Sugarloaf, from NE edge of Moonridge to NE edge of Sugarloaf. Fencing on major entry point, but trespass and vandalism are problems. Pebble plain with many rare associated spp. Relatively undisturbed 10 acre parcel designated as mitigation bank. NHF, PVT.	SBD
*	100	2000	S of Hwy 38, immediately SE of JCT of Hwy 38/FR 3N69 (Gold Mtn Rd). Plants along meadow's edge in dry, sandy, rocky soil and in moister areas w/ <i>Artemisia tridentata</i> , <i>Artemisia ludoviciana</i> , <i>Eriogonum wrightii</i> , <i>Phlox gracilis</i> , <i>Collinsia</i> sp., grasses, <i>Castilleja cinerea</i> . Slightly S-facing gentle slope of 0-5%. Potential disturbance from roadside garbage. SBNF.	SBD

*	10	2000	S side of Big Bear Lake between Fisher Cover and Kidd Cove. Moist-dry meadow west of private road. w/ <i>Sidalcea pedata</i> , <i>Castilleja lasiorhyncha</i> , <i>Phacelia</i> sp., <i>Achillea millefolium</i> , <i>Horkelia</i> sp., <i>Potentilla gracilis</i> , <i>Poa pratensis</i> , <i>Taraxacum officinale</i> , <i>Lupinus</i> sp., <i>Geranium richardsonii</i> , <i>Bromus tectorum</i> , <i>Arctostaphylos</i> sp., <i>Aquilegia formosa</i> . Some littering and possible foot path. Fence/signs are present. SBNF.	SBD
*	> 1000	2000	Sagebrush/pebble plain bordering meadow NE of Baldwin Lake Ecological Reserve parking lot. w/ <i>Artemisia tridentata</i> , <i>Artemisia ludoviciana</i> , <i>Phlox gracilis</i> , <i>Gilia</i> sp., <i>Poa incurva</i> , <i>Linanthus killipii</i> , <i>Mimulus exiguus</i> , <i>Castilleja cinerea</i> , <i>Mimulus suksdorfii</i> . Dry loose fine sand. Some signs of past disturbance, including old road bed and trash. SBNF/CDFG.	SBD
*	U	1966	Big Bear Lake, E end along Hwy 18 (Holmgren, Reveal/UC/Jeps) Landowner: U	SBD
*	U	1975	About 4 mi E of Arrowbear Lake, just W of picnic area, across rd from Snow Valley Ski Lodge (Heckard, Chuang, Bacigalupi) UC/Jeps) SBNF	SBD

*	U	1976	Opposite Holcomb Valley Campground, on S side of 3N09 (3N07?), disturbed site, roadside, heavy clay soil. (Derby/ UC/Jeps) SBNF	SBD
296315 (RSA)	U	1979	Margin of Big Bear Lake, at E end on S side, W of Big Bear City. (Thorne/UC/Jeps) Ownership:U	SBD
339357 (RSA)	U	1979	W edge of Arrastre Flat. (Thorne, Tilforth, Little/UC/Jeps) SBNF	SBD
333742 (RSA)	U	1980	Holcomb Valley Campground, just W. at Placer workings (Thorne, Prigge, Tilforth/UC/Jeps) SBNF	SBD
*	U	2002	Holcomb Valley Campground, N side of camping sites to 3N05. Heavy trampling from adjacent campground use. Unclassified trails rerouted in 2002, signs installed. Habitat recovery unknown. (Kopp/USFS) SBNF	SBD
*	U	2002	W side of Van Dusen Rd at junction with 3N16. Occurrence affected by vehicle parking from Holcomb Valley Campground overload. Boulders placed to exclude vehicle use in 2002. Habitat recovery unknown. (Kopp/USFS) SBNF	SBD

670143 (RSA)	U	1998	Intersection of 3N05 and 3N16 near Wilbur's Pond. Elev. 7300 ft. Lat:34 ° 18'00"N/Lon:116 ° 53'30"W (Schoenig/RSA) SBNF	SBD
*	U	2002	Intersection of 3N05 and 3N16 near Wilbur's Pond. Fencing cut and vehicles entered, causing disturbance to habitat under wet soil conditions (Kopp/USFS) SBNF	SBD
*	U	2001	Fawnskin, N side of Hwy 38, Moon Camp Property. Degraded by vehicle use and parking. (Kopp/ USFS, observed from Highway 38) Pvt	SBD
*	U	2001	Bristlecone Trail area, just south of Lower Moonridge. SBNF	SBD
96501 (RSA)	U	1926	San Bernardino Mts., Bear Valley; dry slope about 0.5 mi. W of boat landing (Munz/RSA)	SBD
509442 (RSA)	U	1982	San Bernardino Mts., Big Bear Valley, Maple Lane near town of Sugarloaf (Krantz/RSA)	SBD
93626 (UCR)	U	1996	Holcomb Valley, N side of the Rd. near site of Belleville, upper Caribou Creek, T3N/R1E/S28 (Sanders/UCR)	SBD
20135 (UCR)	U	1979	San Bernardino Mts., Upper Holcomb Valley. Annual stream near jct. 3N16 and 3N02 (Krantz/UCR)	SBD

15911 (UCR)	U	1979	Along 3N16, about 3 mi. W of county dump (N of Baldwin Lake) where the Rd. to Burnt Flats goes NW (Clarke/UCR)	SBD
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- *U = Unknown*
- **= an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *TNC = The Nature Conservancy*
- *CDFG = California Department of Fish and Game*
- *SBD = San Bernardino County*

Threats

Mimulus purpureus is threatened by habitat degradation from development projects, vehicle use off National Forest System roads, fuels and vegetation treatments, trampling, and mining activities (USDA Forest Service 2002a, 2002b). The primary threat to *Mimulus purpureus* on the San Bernardino National Forest is vehicle use off National Forest System roads. One occurrence in Belleville Meadow in Holcomb Valley is protected by fencing (USDA Forest Service 2002a, 2002b), another is protected from parking by boulder installation. Development is the primary threat to *Mimulus purpureus* on private land. Threats to occurrences in Mexico are not known.

Conservation and Management Considerations

The following list of conservation practices should be considered for *Mimulus purpureus*:

- Implement the Pebble Plain and Meadow habitat management guides.
- Prepare a Habitat Management Guide for vernal wetlands on the SBNF, including mesic swales, seeps and springs. This Guide should specifically address *Mimulus purpureus* and associated mesic species including *Calochortus parmeri* var. *parmeri*, *Mimulus exiguus*, *Phacelia exilis*, *Phacelia mohavensis*, *Castilleja lasiorhyncha*, and *Navarretia penninsularis* where they occur on the SBNF.
- Survey all new occurrences of *Mimulus purpureus* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Mimulus purpureus* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Mimulus purpureus* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Mimulus purpureus is a rare, narrowly-distributed species, known from multiple isolated occurrences. All known occurrences within the planning area (and within the United States) are in the Big Bear and Holcomb and Snow Valley areas of the San Bernardino Mountains. None of these occurrences are fully protected from identified threats.

Based on the above analysis, *Mimulus purpureus* has been assigned the following threat category:

- 5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	A	C	B	D	A

Mimulus purpureus is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The viability of this species is primarily tied to protection and management of meadow, vernal wetland and pebble plain habitat. With implementation of the SBNF Meadow Habitat Management Guide (USDA Forest Service 2002b) and the Pebble Plain Habitat Management Guide (USDA Forest Service 2002a) viability for this species on NFS lands would be improved. Some occurrences of *Mimulus purpureus* are present within the existing Holcomb Valley/North Baldwin Lake Special Interest Area (SIA). This designation would remain under all alternatives, however under Alternatives 2-6, occurrences within this SIA would receive a higher level of protection due to Standard S33. The Suitable Use restricting motorized and mechanized vehicle travel to Forest System roads and designated trails, along with Standards regarding rare species management, recreation, riparian area, and mining management was also considered when predicting the outcomes.

The majority of ongoing and expected impacts to this species occur in Back Country and Developed Area Interface zones. Under Alternatives 1, 2, 3, 4 and 4a, this species would be at continued risk from ongoing impacts to its habitat at approximately current levels. Under Alternative 1, where occurrences overlap with listed species, *Mimulus purpureus* would benefit from conservation measure direction under the Southern California Conservation Strategy, however there would be no special area designations recommended under this alternative. The primary theme of Alternative 2 is to maintain biological diversity and ecological integrity while accommodating a gradual increase in recreation

opportunities and this would be expected to benefit the species. Under Alternatives 4 and 4a, impacts associated with higher levels of expected recreational use would be minimized by expected increases in management control and monitoring. Effects would be lower in Alternative 4a due to a portion of the habitat occurring within a Back Country Motorized Use Restricted zone. In addition, the emphasis in this alternative is to sustain the setting through management of dispersed recreation and to maintain or expand existing facilities prior to constructing new ones at a low rate. Under Alternative 5 there would be increased threats as a result of an increase in Back Country zoning across the range of the species, an expected increase in road and trail construction and use, and potential for additional water diversions/ extractions. There would be no special area designations recommended under Alternative 5. Under Alternative 6, threats would decrease as a result of an increase in Back Country Non-Motorized and Back Country Motorized Use Restricted zoning across the range of the species, and no expected increase in road and trail construction.

Preparation of a Habitat Management Guide to address this species would be expected to have a higher priority and happen sooner under Alternatives 2, 3, 4, 4a and 6. The response time and effectiveness of impact identification and management would be expected to be higher under Alternatives 3 and 6. The recommendation to establish the candidate Arrastre Flat Research Natural Area under Alternatives 2, 3, 4a, and 6 would provide a higher level of protection for a small portion of the species range.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

The private lands of Big Bear Valley have been highly reduced and fragmented by residential and commercial development. Some habitat on private lands is annually degraded by unauthorized use for snowplay, unauthorized driving and vehicle parking. The remaining fragments continue to be lost as continued development occurs. These factors will likely result in the loss of occurrences. As development increases, the demand for water and new diversions/extractions also increases. The majority of the distribution of this taxon occurs on National Forest System lands on the SBNF. While this species continues to lose important habitat to private land development, this loss is not expected to substantially reduce the viability of the protected and managed occurrences on the SBNF.

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Monardella cinerea

Monardella cinerea Abrams (Gray monardella)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Monardella cinerea is endemic to the eastern San Gabriel Mountains. That it may occur in the southern outer South Coast Range was indicated as in doubt by Jokerst (1993). A specimen collected in the San Jacinto Mountains has been identified by Moe as *Monardella austrialis* (Painter 2004).

Distribution in the Planning Area

Monardella cinerea is known from three occurrences in the San Gabriel Mountains at Horse Flats, Crystal Lake, and Mt. Harwood on the Angeles and San Bernardino national forests (USDA Forest Service 2003). In addition, CalFlora (2002) reports occurrences from Roundtop Mountain and Mount San Antonio on the Angeles National Forest.

Taxonomy and Natural History

Monardella cinerea is a dicotyledon in the mint family (Lamiaceae). This perennial rhizomatous herb blooms from July-August (California Native Plant Society 2001). *Monardella cinerea* is a perennial matted or tufted plant with hairs that are more or less long-spreading and short-glandular. Stems are decumbent and 5-15 cm. The leaves are sessile, 5-10 mm, and triangular-ovate. The leaf margins are sometimes faintly wavy and there are few to several (rarely zero) teeth. The lower leaf surface is more or less covered by gold gland-dots. The inflorescence is characterized by one head per main stem. The bracts are narrowly oval, acute, scarious, hairy, and red to purple. The stamens are slightly exerted (Jokerst 1993).

Habitat Description

Monardella cinerea inhabits loose, granitic talus within upper montane and subalpine conifer forest above 5900 feet.

Occurrence Status

All known occurrences are on the San Bernardino and Angeles national forests.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences. The San Jacinto Mountain occurrence below has been identified as *M. australis*.

OCCURRENCE DATA – *Monardella cinerea* (Gray monardella)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
1821353	U	1992	Lowest point between Mt. Harwood and East Balder Peak, ca. 220' S of Devil's Backbone Trail. SBNF.	SBD
1821354, 1227110	U	1937	San Antonio Peak. SBNF/ANF.	SBD/LA
1312254	U	1957	SE of Mount San Antonio; in bowl S of San Antonio Ski Hut. San Gabriel Mountains. SBNF.	SBD
1343973	U	1991	Roundtop Mountain. San Gabriel Mountains. ANF.	LA
1415344	U	1934	East slope of North Baldy. San Gabriel Mountains. ANF.	LA
*	U	U	Horse Flats (E of Mt Hillier), ANF	LA
*	U	U	Crystal Lake	LA

*	U	U	Mt. Harwood	SBD
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- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

Threats

Threats to *Monardella cinerea* include dispersed recreational activities, especially near campgrounds, trails and roads with heavy recreation use.

Conservation and Management Considerations

The primary strategy for this species is to improve the knowledge of its distribution and occurrence status. The following is a list of conservation practices that should be considered for *Monardella cinerea*:

- Survey all new occurrences of *Monardella cinerea* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats. Implement protective measures where needed.
- Collect a herbarium voucher specimen of *Monardella cinerea* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Monardella cinerea* in the planning area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Monardella cinerea is narrowly distributed and rare throughout its range. While some of the recorded occurrences are vulnerable to identified threats, others are remote and not vulnerable to impacts.

Based on this analysis, *Monardella cinerea* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Monardella cinerea is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Monardella cinerea* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Monardella cinerea* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Monardella cinerea* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

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Mimulus purpureus

**Monardella hypoleuca ssp.
lanata**

Monardella hypoleuca ssp. lanata

Monardella hypoleuca Gray ssp. *lanata* (Abrams) Munz (Felt-leaved monardella)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2G3, S2S3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B R-E-D Code 2-2-2

General Distribution

Felt-leaved Monardella is endemic to the west slope of the Peninsular Ranges in San Diego County and northern Baja California, Mexico (Jokerst 1993; Reiser 1994). About 50 occurrences are located on federal, state, and private lands (Stephenson and Calcarone 1999).

Distribution in the Planning Area

Occurrences are documented within the Cleveland National Forest in the Palomar and Laguna Mountains (Stephenson and Calcarone 1999; California Natural Diversity Database 2004). Occurrences recorded in the Santa Ana Mountains are now believed to be erroneous (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Felt-leaved Monardella (Lamiaceae) is a rhizomatous, aromatic perennial herb that blooms from June through July (CNPS 2001). Two subspecies of *M. hypoleuca* are recognized. *M. hypoleuca* ssp. *hypoleuca* is the more widespread subspecies, occurring in the South Coast Ranges, the Western Transverse Ranges, the San Gabriel Mountains, the Peninsular Ranges, and along the south coast (Jokerst 1993). *M. hypoleuca* ssp. *lanata* has considerably denser hairs on the stems and narrower leaves than ssp. *hypoleuca* (Jokerst 1993).

Angled stems of Felt-leaved Monardella arise from a creeping rootstalk. Simple or branched stems 2 to

5 dm long with wooly, soft hair. Sessile to short petioled leaves are oblong to lanceolate with strongly revolute margins, 15 to 30 mm long, and at short axillary branchlets leaves are reduced. The leaves can be characterized by dull, soft and downy to wooly hair on upper surface and a lower surface of dense white, matted, soft wool. White flowers occur in dense terminal heads, 2 cm wide, subtended by herbaceous, densely hairy, green to purplish, erect bracts (Jokerst 1993).

Habitat Description and Status

Felt-leaved *Monardella* grows in the understory of mixed chaparral, chamise chaparral, and southern oak woodland at elevations between 975–5,118 feet (300–1,575 meters) (California Natural Diversity Database 2004). The taxon occurs mainly on gabbro soils (Stephenson and Calcarone 1999).

Occurrence Status

Fifty percent of California Natural Diversity Database felt-leaved monardella occurrences are located within Cleveland National Forest boundaries, five percent are located within private land holding, and the remaining thirty-eight percent can be found on lands of unknown ownership (California Natural Diversity Database 2004). Populations on the Cleveland National Forest appear stable and are relatively well protected (USDA Forest Service 1998; Stephenson and Calcarone 1999). Populations on private lands in San Diego County also seem to be stable, probably due to the tendency of this subspecies to occupy peaks and ridgelines (Reiser 1994).

OCCURRENCE DATA of *Monardella hypoleuca* ssp. *lanata* (Felt-leaved Monardella) on National Forest lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
*	2-1	U	U	Viejas Mountain / CNF	SD
*	2-2	U	1980	Cuyamaca Peak Road / CNF	SD
*	2-3	U	U	Viejas Mountain / CNF	SD
4	2-4	U	1980	Lawson Peak / CNF	SD
3	2-5	U	U	Lawson Peak. / CNF	SD

3	2-6	U	U	Lawson Peak / CNF	SD
5	2-7	U	1977	Lyon's Peak / CNF	SD
13	2-8	U	U	Black Mountain / CNF	SD
13	2-9	U	U	Black Mountain / CNF	SD
13	2-10	U	U	Black Mountain / CNF	SD
13	2-11	U	U	Black Mountain / CNF	SD
13	2-12	U	U	Black Mountain / CNF	SD
13	2-13	U	U	Black Mountain / CNF	SD
13	2-14	U	U	Black Mountain / CNF	SD
34	2-15	U	U	Mesa Grande Quad. / CNF	SD
34	2-16	U	U	Mesa Grande Quad. / CNF	SD
34	2-17	U	U	Boulder Hill / CNF	SD
*	2-24	U	U	Mesa Grande Quad. / CNF	SD
13	2-25	U	U	Black Mountain / CNF	SD
18	2-26	100-1000	1986	Barber Mountain Road /CNF	SD
18	2-27	100-1000	1986	Barber Mountain Road /CNF	SD
26	2-33	25-50	1987	Chiquito Peak / CNF	SD

30	2-35	1000	1994	El Cajon Mountain / CNF	SD
29	2-36	5	1993	El Cajon Mountain / CNF	SD
32	2-37	25 +	1995	Mesa Grande, NE side Temescal Creek / CNF	SD
*	2-38	50	2001	Lawson Peak / CNF	SD
22	2-39	300	2001	Lawson Peak / CNF	SD
*	2-40	1075	2001	Barber Mountain / CNF	SD
23	2-41	30	2001	Barber Mountain / CNF	SD
19	2-42	U	2001	Barber Mountain / CNF	SD
19	2-43	U	2001	Barber Mountain / CNF	SD
*	2-44	100	2001	Lawson Peak / CNF	SD
28	2-45	50	2001	Rock Mountain / CNF	SD
6	2-46	30	2001	Poser Mountain / CNF	SD
25	2-47	10	2001	Viejas Mountain / CNF	SD
24	2-48	200	2001	Viejas Mountain / CNF	SD

*	2-49	100 +	2002	Off Black Mountain Truck Trail / CNF	SD
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- *U = Unknown.*
- * = *an occurrence number has not been assigned*
- *CNF = Cleveland National Forest*
- *SD = San Diego County*

Threats

Cleveland National Forest Felt-leaved *Monardella* occurrences at Lawson Peak, Barber Mountain, Viejas Mountain, and El Cajon Mountain are along forest system roads; unauthorized off highway vehicle (OHV) impacts affect populations on Viejas, Poser, and Barber Mountains; and one population at Lawson Peak is located near a dirt trail. Potential threats to populations beyond Forest boundaries include rodent grazing on the north slope of Sequan Peak and recreational impacts associated with rock climbing at Woodson Mountain (California Natural Diversity Database 2004; Forest Records).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Monardella hypoleuca* ssp. *lanata*:

- Monitor populations near Forest system roads, trails, and OHV routes. Implement management to protect populations as necessary.

Evaluation of Current Situation and Threats on National Forest Systems Lands

Although some populations of *Monardella hypoleuca* ssp. *lanata* on National Forest System lands may be affected by road maintenance activities and unauthorized OHV use, the populations appear to be stable at this time. Occurrence of the taxon along roads and trails suggests that it is tolerant of mild disturbance. This plant has a limited distribution and appears to be confined to gabbro soils; however, *Monardella hypoleuca* ssp. *lanata* does not appear to be subject to substantial risks from Forest Service activities at this time.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, but usually abundant where found, in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Monardella hypoleuca ssp. *lanata* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Monardella hypoleuca* ssp. *lanata* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Monardella hypoleuca* ssp. *lanata* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Monardella cinerea

**Monardella linoides ssp.
oblonga**

Monardella linoides ssp. oblonga

Monardella linoides Gray ssp. *oblonga* (Greene) Abrams (Flax-like monardella)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G5T2, S2.2 – Threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Monardella linoides ssp. *oblonga* occurs in the southern Sierra Nevada and Tehachapi Mountains from Tulare County to Kern and Ventura Counties (Jokerst 1993, California Native Plant Society 2001). It is known from about 20 occurrences (California Native Plant Society 2001).

Distribution in the Planning Area

The California Natural Diversity Database contains records for ten occurrences of *Monardella linoides* ssp. *oblonga*, all on National Forest System lands. Nine of the occurrences are found on the Los Padres National Forest, and more potential habitat exists that has yet to be surveyed (Stephenson and Calcarone 1999; California Natural Diversity Database 2002).

On the Los Padres National Forest *Monardella linoides* ssp. *oblonga* is found in the western Transverse Range in a polygon delimited by the following: Cerro Noroeste in the northwest, Frazier Mountain in the northeast, Alamo Mountain in the southeast, and San Guillermo Mountain in the southwest (Foster 2002). Mount Pinos, near the north-central border of this polygon supports the greatest density of *Monardella linoides* ssp. *oblonga*. Plants have also been found near Brush Mountain in the Tecuya Mountains and more plants are expected to be found elsewhere in the Tecuya Mountains. Except for a portion of one occurrence (near Boy Scout Camp), all known occurrences of *Monardella linoides* ssp. *oblonga* within the boundaries of the Los Padres National Forest are on National Forest System land.

Taxonomy and Natural History

Monardella linoides ssp. *oblonga* is a dicot in the mint family (Lamiaceae).

Monardella linoides ssp. *oblonga* is a rhizomatous perennial herb that blooms June–August (California Native Plant Society 2001). *Monardella linoides* ssp. *oblonga* differs from other subspecies by the following: Stems are silvery or ash-gray. Leaves are 10-15 mm, narrowly ovate, ash-gray. Inflorescence: bracts > calyces, rose-purple (Jokerst 1993).

Habitat Description

Monardella linoides ssp. *oblonga* grows among rock outcrops and general openings in mixed conifer forests, yellow pine forests, pinyon-juniper woodlands, and desert scrub habitat (Stephenson and Calcarone 1999, California Native Plant Society 2001, California Natural Diversity Database 2002).

Occurrence Status

Monardella linoides ssp. *oblonga* is distributed in several highly restricted occurrences but currently is not considered to be at risk of extinction (California Native Plant Society 2001). The known occurrences of *Monardella linoides* ssp. *oblonga* on National Forest System lands appear to be stable or increasing in size (Stephenson and Calcarone 1999).

There are five metapopulations of *Monardella linoides* ssp. *oblonga* on the Mount Pinos Ranger District of the Los Padres National Forest, all but one geographically centered on a mountain top. These mountains are: Alamo Mountain, Cerro Noroeste (Mt. Abel), Frazier Mountain, and Mount Pinos. One metapopulation is found in the mountainous uplands of the Upper Piru Creek watershed. The plants within the area occupied by each metapopulation are locally common, sometimes locally rare. Each metapopulation consists of about 5 to 45 discrete patches of *Monardella linoides* ssp. *oblonga*. The number of plants found in each metapopulation is roughly and conservatively estimated as follows: 600, 1000, 1000, 1900, and 5600.

Threats

This taxon is known to respond positively to wildfire events; however, some occurrences are vulnerable to road/trail maintenance and off-road vehicle activity (Stephenson and Calcarone 1999).

Monardella linoides ssp. *oblonga* is found on roadcuts, in campgrounds, adjacent to OHV trails, adjacent to hiking trails, and in areas subject to fuels management. Where plants are found in roadcuts, 'source' populations are present above the roadcut in most instances. When plants are lost to due to road maintenance or accelerated erosion, new plants often pioneer the new disturbance. Road cut densities appear stable.

Plants found in campgrounds are often subject to trampling and often have a flattened appearance and

apparently poor vigor. Source populations are present in the nearby forest matrix. Some patches of plants in Campo Alto Campground and McGill Campground may ultimately become extirpated due to chronic disturbance. However, these campgrounds have been in constant use since the 1950s and yet plants remain in designated camping areas. This suggests that *Monardella linoides* ssp. *oblonga* is fairly resistant to this type of impact.

Plants found adjacent to OHV and hiking trails do not appear to be adversely affected by this land use. Where plants are present on both sides of a trail it is obvious that plants were lost during trail construction. Some plants have also been noted to be impacted by mountain bike use of hiking trails where bicyclists have gone off trail. The magnitude of this impact has so far been small.

Monitoring of *Monardella linoides* ssp. *oblonga* during and after the Mount Pinos III prescribed burn (Foster 1999) found that fall burns did not affect this taxon at this location.

Conservation and Management Considerations

During project surveys, record information on occurrences of *Monardella linoides* ssp. *oblonga* and use this information to track or 'watch' for trends in species abundance and distribution.

Evaluation of Current Situation and Threats on National Forest System Lands

Monardella linoides ssp. *oblonga* has a disjunct distribution with plants found in the southern Sierra Nevada and western Transverse Range. Occurrences found on the Los Padres National Forest are well distributed across areas of suitable habitat and there is no apparent decline in the abundance and distribution of the species relative to its historic distribution. Monitoring of occurrences has shown that plants are tolerant of current and anticipated levels of livestock grazing and that plants are adapted to surviving fire events.

Based upon the above analysis *Monardella linoides* ssp. *oblonga* has been assigned the following threat category:

3. Common or widespread in plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Monardella linoides ssp. *oblonga* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Monardella linoides*

ssp. oblonga would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Monardella linoides ssp. oblonga* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Monardella hypoleuca ssp.
lanata**

**Monardella macrantha ssp.
hallii**

Monardella macrantha ssp. hallii

Monardella macrantha A. Gray ssp. *hallii* Abrams (Hall's monardella)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Monardella macrantha ssp. *hallii* occurs in the San Gabriel, San Bernardino, San Jacinto, Santa Ana, Palomar, and Agua Tibia Mountains in Los Angeles, San Bernardino, Riverside, Orange, and San Diego counties (California Natural Diversity Database 2004). The California Natural Diversity Database (2004) lists 26 occurrences.

Distribution in the Planning Area

Monardella macrantha ssp. *hallii* mostly found on or adjacent to National Forest System lands (California Natural Diversity Database 2004). Thirteen of the occurrences are on the Cleveland National Forest. One of these occurrences is located within the Cahuilla Mountain Research Natural Area. Four occurrences are located on the San Bernardino National Forest, and one occurrence is reported from the Angeles National Forest (California Natural Diversity Database 2004).

Taxonomy and Natural History

Monardella macrantha ssp. *hallii* is a dicotyledon and member of the mint family (Lamiaceae). It is one of two subspecies of *Monardella macrantha* that occur in California. Subspecies *hallii* is morphologically distinguished from subspecies *macrantha* by leaf shape and the presence of hairs on the stems and leaves. These two subspecies frequently intergrade (Jokerst 1993). Graduate work done by Linda Allen at Cal Poly San Luis Obispo has shown that some of the San Bernardino Mountains occurrences are intermediate with *M. macrantha* ssp. *macrantha* (Allen 1994).

Monardella macrantha ssp. *hallii* is a perennial rhizomatous herb that blooms from June to August (California Native Plant Society 2001).

Monardella macrantha is a perennial, low, open, tufted, rhizomed plant. The leaves are 5-30 mm, leathery, and entire to minutely serrate, deep green, and shiny. The inflorescence is characterized by 20-40 mm wide heads, oblong-elliptic bracts with the outer series like the leaves and the inner series scarious, hairy, ciliate, and often reddish. The calyx is 20-25 mm, 2-lipped, bent, hairy, and more or less glandular. The corolla is 35-45 mm, red-orange to yellow. The tube is 1.5-3 mm wide at the top, funnel-shaped, and is exerted from the calyx with ascending lobes. The anthers are 1.2-1.5 mm and are exerted. *Monardella macrantha* ssp. *hallii* has hairy stems. The leaves are triangular-ovate, sparsely to densely hairy, ciliate, and have a truncate base. The calyx is long-spreading-hairy (Jokerst 1993).

Habitat Description

Monardella macrantha ssp. *hallii* occupies valley-foothill grassland, chaparral, cismontane woodland, broad-leaved upland forest, and lower montane conifer forest between elevations of 2,400-7,200 feet (731-2,194 meters) (California Native Plant Society 2001). It grows in rocky places and in openings in the vegetation such as near rocky rubble and boulders where shrub cover is limited. If present, the canopy may provide occasional shade. At Mount Laguna, the soil type consists of coarse sandy loam (Sierra Club 1999).

Chaparral, woodland, and forest habitats across the Province has been impacted by fire suppression activities. Post-climax chaparral is especially at risk from intense fires.

Occurrence Status

Eighteen of the 26 recorded occurrences are on National Forest Service land. One of the CNF occurrences is located within the Cahuilla Mountain Research Natural Area, where a portion of the population burned in the 1996 Diego Fire

The following table shows the recorded occurrences in/near the area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Monardella macrantha* ssp. *hallii* (Hall's monardella)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

20	U	1979	Aguanga Ridge, Palomar Mountain. CNF.	SD
21	500 in 1979, < 1000 in 1986	1990	Palomar Divide Truck Trail just N of High Point, Palomar Mountains. On both sides of road, extends from upper slope to ridgetop. N-facing slope in chaparral understory w/ <i>Quercus kelloggii</i> , <i>Pseudotsuga macrocarpa</i> , <i>Arctostaphylos glandulosa</i> , <i>Calocedrus decurrens</i> , <i>Arctostaphylos patula</i> , <i>Ceanothus</i> , <i>Cercocarpus montanus</i> , <i>Eriogonum fasciculatum</i> . CNF.	SD
22	U	1978	0.5 mi. W of High Point Lookout near Palomar Divide Truck Trail, Palomar Mountains. Positive identification not made. PVT-Palomar Observatory.	SD
23	U	1983	Just E of upper Doan Valley ca. 1.6 mi. ENE of Boucher Hill, Palomar Mtns. 2 colonies. CNF.	SD
24	U	1938	Chimney Creek, S of Upper Doan Valley, Palomar Mtns. Land owner: U.	SD

25	U	1991	N slope of Boucher Hill ca. 0.4 mi. N of Lookout, Palomar Mtns. In understory of <i>Abies concolor</i> , <i>Pinus jeffreyi</i> , <i>Pseudotsuga macrocarpa</i> , <i>Calocedrus decurrens</i> , <i>Quercus chrysolepis</i> , <i>Q. kelloggii</i> , <i>Ceanothus palmeri</i> , <i>Toxicodendron diversilobum</i> , <i>Symphoricarpos mollis</i> , <i>Bromus grandis</i> . DPR-Palomar Mtn. SP.	SD
26	10,000 (between occ. 26, 37, 38, 39, 48, 49)	1995	W of Cutca Valley along Magee-Palomar Trail, ca. 1.4 mi. E of Eagle Crag, Agua Tibia Mtns. Coast live oak woodland, big cone fir forest, canyon live oak woodland. w/ riparian spp. In event of wildfire, may be impacted by fire suppression. CNF.	SD
27	U	1962	Sugarloaf, Santa Ana Mountains. N slope, semishaded under shrubs. w/ <i>Quercus dumosa</i> , <i>Arctostaphylos</i> , <i>Dicentra chrysantha</i> . CNF?	Orange
31	< 100 in 1981	1992	Yucaipa Ridge along Truck Trail and aqueduct, ca. 1.5 mi. SE of Mountain Home Village, San Bernardino Mtns. Granitic rocky soil w/ <i>Pinus coulteri</i> , <i>Pseudotsuga macrocarpa</i> , <i>Calocedrus decurrens</i> , <i>Quercus kelloggii</i> , <i>Q. chrysolepis</i> , <i>Pteridium aquilinum</i> , <i>Polystichum scopulinum</i> . SBNF/PVT.	SBD

32	'many'	1992	Aqueduct along S side of Mill Creek Canyon, ca. 0.7 mi. E of Mountain Home Village, San Bernardino Mtns. Filtered sun or partial shade of scrub oak chaparral and bigcone fir-canyon live oak forest on steep N-facing slope. 3 colonies. Brush cutting from trail discarded on some sites. Possible threat from intense fire. SBNF.	SBD
33	'several'	1991	Old City Creek Road near Hwy 330, btw. Little Mill Creek and Long Point, San Bernardino Mtns. Transition of chaparral (<i>Arctostaphylos pringlei</i> , <i>A. glauca</i> , <i>A. glandulosa</i> , <i>Quercus kelloggii</i> , <i>Q. chrysolepis</i> , <i>Q. wislizenii</i>) and lower conifer forest (<i>Pseudotsuga macrocarpa</i> , <i>Pinus coulteri</i>). Fire suppression may limit habitat. SBNF.	SBD
34	100-1000 in 1986	1986	E of High Point Truck Trail ca. 0.9 mi. NNE of High Point, Palomar Mtns. Road transects occurrence. Upper slope w/ overstory of broadleaf chaparral. Granitic soil w/ <i>Adenostoma sparsifolium</i> , <i>Quercus berberidifolia</i> , <i>Cercocarpus betuloides</i> . CNF.	SD
35	10-50 in 1981	1986	Tributary to W Fork San Luis Rey River, SE end of Palomar Mtn. ca. 1.4 mi. SE of Highpoint. Big cone fir forest on S-facing slope. CNF.	SD

37	10,000 (inc. occ. 26, 37, 38, 39, 48, 49)	1995	W of Cutca Valley along Magee-Palomar Trail, ca. 0.5 mi. E of Eagle Crag, Agua Tibia Mtns. Coast live oak woodland, big cone fir forest, canyon live oak woodland w/ riparian spp. Site may be impacted by fire suppression. CNF.	SD
38	10,000 (inc. 26, 37, 38, 39, 48, 49)	1995	Along drainage on N slope of Agua Tibia Mtn., ca. 1.1 mi. N of SD/RIV County line. May be impacted by fire suppression. CNF.	RIV
39	10,000 (inc. 26, 37, 38, 39, 48, 49)	1995	Upper slopes of N end of Agua Tibia Mtn. btw. Magee-Palomar Road and SD/RIV Co. line. CNF.	SD
40	U	1992	N slope of Cahuilla Mtn. along USFS Trail 2E45. Along trail btw. 5200-5480'. Locally common among rocks and under shrubs w/ <i>Pinus jeffreyi</i> , <i>Quercus chrysolepis</i> , <i>Arctostaphylos pringlei</i> , <i>Ceanothus leucodermis</i> , <i>Eriophyllum confertifolium</i> , <i>Elymus glaucus</i> , <i>Bromus grandis</i> , <i>B. sitchensis</i> , <i>Koeleria pyramidata</i> . SBNF.	RIV

41	10-15 in 1988	1988	SW slope of Modjeska Peak along Main Divide Rd. Sandy soils on W-facing slope at base of talus slide w/ <i>Phacelia imbricata</i> in montane chaparral. <i>Phacelia suaveolens</i> ssp. <i>keckii</i> occurs nearby. ca. 0.2 mi. NE of hairpin turn in road. Not seriously threatened unless road widens. CNF.	Orange.
42	500	1995	Coldwater Trail ca. 1.8 mi. NE of Santiago Peak, Santa Ana Mountains. Shady area under <i>Pseudotsuga macrocarpa</i> , <i>Quercus chrysolepis</i> along trail on ridge that descends to NE from Santiago Peak along NW facing portion of slope. CNF.	RIV
43	U	1992	E of Yucaipa Ridge along University Creek at aqueduct crossing, ESE of Mountain Home Village, San Bernardino Mtns. Bigcone spruce-canyon live oak forest on W-facing slope. Plants on downslope edge of trail. Potential threat from trail maintenance. PVT.	SBD
44	'many'	1992	Yucaipa Ridge along Truck Trail and aqueduct, ca. 0.7 mi. S of Mountain Home Village, San Bernardino Mtns. Mostly partial shade or filtered sun of bigcone spruce-canyon live oak forest, coulter pine forest, scrub oak chaparral on ridgetop and steep, N-facing slope. 9 colonies. PVT/SBNF.	SBD

45	'many'	1992	Aqueduct on S side of mouth of Mill Creek Canyon, San Bernardino Mtns. Brush cuttings from trail maintenance discarded on site. Potential threat from intense fires in postclimax chaparral. Filtered sun or partial shade of scrub oak chaparral and bigcone spruce-canyon live oak forest. PVT in SBNF.	SBD
46	'many'	1992	Aqueduct on S side of Mill Creek Cyn., ca. 1.5 mi. WSW of Mountain Home Village, San Bernardino Mtns. Brush cuttings from trail maintenance discarded on site. Potential threat from intense fires in postclimax chaparral. Filtered sun or partial shade of scrub oak chaparral and bigcone spruce-canyon live oak forest. PVT in SBNF.	SBD
47	U	1991	Sunset Ridge Rd. NW of Spruce Cyn, ca. 1.5 mi. S of Sunset Peak, San Gabriel Mtns. Along E-facing roadcut at 4920'. In shade of <i>Pseudotsuga macrocarpa</i> , <i>Quercus chrysolepis</i> w/ <i>Arctostaphylos</i> , <i>Cercocarpus montanus</i> , <i>Rhus diversiloba</i> , <i>Bromus grandis</i> , <i>B. sitchensis</i> , <i>Elymus glaucus</i> . ANF.	LA
48	10,000 (inc. 26, 37, 38, 39, 48, 49)	1995	Agua Tibia Creek ca. 0.2 mi. S of Crosley Saddle, Agua Tibia Mtns. Coast live oak woodland, big cone fir forest, canyon live oak woodland w/ riparian spp. May be impacted by fire suppression. CNF.	SD

49	10,000 (inc. 26, 37, 38, 39, 48, 49)	1995	Crosley Trail near Tributary to Arroyo Seca Creek, ca. 0.7 mi. NE of Crosley Saddle, Agua Tibia Mtns. w/ riparian spp. May be impacted by fire suppression. CNF.	SD
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- *U* = Unknown
- * = an occurrence number has not been assigned
- *SBNF* = San Bernardino National Forest
- *ANF* = Angeles National Forest
- *CNF* = Cleveland National Forest
- *SBD* = San Bernardino County
- *SD* = San Diego County
- *LA* = Los Angeles County
- *RIV* = Riverside County

Threats

Monardella macrantha ssp. *hallii* may be threatened by trampling from hikers and other recreationists (Reiser 1994). However, this taxon may be somewhat tolerant to disturbance and fire may positively affect the populations. Some populations exhibited higher densities after fire. Another occurrence was observed with individuals growing in disturbed areas. The decreased competition from other plants may promote plant growth (USDA Forest Service 2002). Hybridization may also pose a threat to this species unrelated to Forest Service actions.

Conservation and Management Considerations

The primary conservation strategy for this species is to better understand its distribution, status, and fire ecology. The following is a list of conservation practices that should be considered for *Monardella macrantha* ssp. *hallii*:

- Survey all new occurrences of *Monardella macrantha* ssp. *hallii* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Whenever an occurrence burns in wild or prescribed fire, monitor for post-fire resilience.
- Collect a herbarium voucher specimen of *Monardella macrantha* ssp. *hallii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Monardella macrantha* ssp. *hallii* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Monardella macrantha ssp. *hallii* is a southern California endemic, known from scattered occurrences mostly from National Forest System Lands. While none of these occurrences are fully protected from identified threats, several occurrences across the range are not at risk, and this species has shown a tolerance for moderate levels of disturbance.

Based on the above analysis, *Monardella macrantha* ssp. *hallii* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Monardella macrantha ssp. *hallii* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Monardella macrantha* ssp. *hallii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Monardella macrantha* ssp. *hallii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

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**Monardella linoides ssp.
oblonga**

**Monardella nana ssp.
leptosiphon**

Monardella nana ssp. leptosiphon

Monardella nana A. Grey ssp. *leptosiphon* (Torrey) Abrams (San Felipe monardella)

Management Status

Federal: Forest Service Sensitive

Heritage Rank: G4G5T2, S2.2 (California Natural Diversity Database 2002b)

California Native Plant Society: List 1B; R-E-D Code 3-2-2 California Native Plant Society 2001)

General Distribution

Monardella nana ssp. *leptosiphon* is found primarily on Palomar Mountain in San Diego County (Jokerst in Hickman, ed. 1993, California Natural Diversity Database 2002a). The California Natural Diversity Database (2002a) contains records for 11 occurrences in San Diego County; additional occurrences are reported from the San Jacinto Mountains of Riverside County (CalFlora 2000).

Distribution in the Planning Area

An estimated 25 occurrences of *Monardella nana* ssp. *leptosiphon* have been reported on the Cleveland and San Bernardino national forests by Forest botanists and biologists. The California Natural Diversity Database (2002a) contains records for 11 occurrences on the Palomar Ranger District of the Cleveland National Forest.

Taxonomy and Natural History

Monardella nana ssp. *leptosiphon* is a dicotyledon in the mint family (Lamiaceae) (Jokerst in Hickman, ed. 1993). *Monardella nana* ssp. *leptosiphon* blooms June–July (California Native Plant Society 2001).

Monardella nana is a matted or tufted, rhizomed perennial herb. The inflorescence head is 10-35 mm wide, the bracts are 15-20 mm, the outer bracts may or may not be like the leaves, the middle bracts are white, generally rose- or purple-tinged. The anthers are less than 1 mm. *Monardella nana* ssp. *leptosiphon* is distinguished by the following characteristics. This taxon has 5-30 cm stems with 0 or spreading hairs. The leaves are 10-30 mm, ovate to round, green, and have more or less sparse,

spreading hairs. The corolla is cream-yellow, the tube is 20-25 mm, 1.5-2 times the calyx, approximately 1 mm wide, with spreading lobes that are 7-10 mm. The stamens are slightly exerted. (Jokerst 1993).

Studies of the taxon in the San Jacinto Mountains indicate that those populations are intermediate between *M. nana* ssp. *tenuiflora* to the north and *M. nana* ssp. *leptosiphon* to the south (Allen 1994). Occurrences reported from Palomar Mountain may be another taxon or an intermediate form (Allen 1994). Plants from Hot Springs Mountain, Volcan Mountain, and Banner Grade appear to be better representatives of *Monardella nana* ssp. *leptosiphon* than do specimens from Palomar Mountain (Allen 1994).

Habitat Description

Monardella nana ssp. *leptosiphon* inhabits chaparral, mixed conifer forest, and yellow pine forest, at elevations of 3,950–10,050 feet (1,200–1,855 meters) (California Native Plant Society 2001). General habitats for *Monardella nana* ssp. *leptosiphon* appear to be widespread; however, there may be specific microhabitats that are much more narrowly distributed.

Occurrence Status

Monardella nana ssp. *leptosiphon* appears to be stable to increasing on National Forest System lands (USDA Forest Service 2003). See Taxonomy and Natural History section above for status of some of these locations listed in table below.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Monardella nana* ssp. *leptosiphon* (San Felipe monardella)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	10 in 1979	1979	On the S-side of the Palomar Divide Truck Trail, NW of BM5590, Palomar Mountains. Chaparral. Plants in immediate vicinity of a fire break. CNF.	SD

2	U	1985	On Barker Valley Trail, 660 ft. N of Barker Valley Meadow, ca. 3 mi. SE of Palomar Mountain. In the shade of brush islands dominated by <i>Quercus dumosa</i> within a coast live oak woodland and broadleaf chaparral community. Population bisected by a heavily used trail. CNF.	SD
3	50+	1986	On spur road leading to High Point Lookout, Palomar Mountain. On roadbank and in understory of chaparral. On sheephead soil w/ chamise and <i>Arctostaphylos glandulosa</i> . CNF.	SD
4	'thousands' in 1986	1986	N of East Grade Road, ca. 6 mi. NW of JCT w/ Hwy 76, N of Pine Hills between Dyche Valley and Will Valley. On granitic substrate as an understory component in conifer forest. Associated w/ <i>Ceanothus leucodermis</i> , coulter pine, black oak, and big cone Douglas fir. Timber harvest and a recreation trail in the area. CNF.	SD

5	'thousands' in 1986	1986	N of East Grade Rd., N of Pine Hills, NE of Dyche Valley. On granitic substrate as an understory component of conifer forest. Associated w/ <i>Ceanothus leucodermis</i> , coulter pine, black oak, big cone Douglas fir. 2 populations. Timber harvest and a recreation trail in the area. CNF.	SD
6	U	U	Less than 0.5 mi. of High Point Lookout, Palomar Mountain. CNF.	SD
7	U	U	On firebreak along Oak Grove Truck Trail. CNF.	SD
8	U	U	Approximately 1.5 air mi. E of High Point Lookout, Palomar Mountain. CNF.	SD
9	U	U	Approximately 1 air mi. SE of High Point Lookout, Palomar Mountain. 2 populations in this occurrence. CNF.	SD
10	'thousands' in 1986	1986	Pine Hills, SE of Dyche Valley. On crouch soil with an average of 2 inches of pine-oak leaf litter. Associated w/ coulter pine, black oak, and big cone Douglas fir. Threatened by fuelwood harvesting and some cattle grazing. 3 populations here. CNF.	SD

11	U	1986	Along High Point Truck Trail, N of JCT w/ Palomar Divide Truck Trail, Palomar Mountain. On road edge of fuelbreak on sheephead soil series. Associated w/ mountain mahogany, scrub oak, <i>Arctostaphylos glandulosa</i> , <i>Ceanothus greggii</i> var. <i>perplexans</i> , <i>Artemisia tridentata</i> . Area grazed by cattle and central portion of occurrence type-converted to <i>Elymus</i> and <i>Bromus mollis</i> . CNF.	SD
*(RSA)	U	1924	Laguna Mountains, Laguna Lakes region. Rocky places near small stream.	SD
*(RSA)	U	1945	Henshaw Road from Palomar.	SD
*(RSA)	U	1934	East to Julian, Cuyamaca Mountains.	SD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *CNF = Cleveland National Forest*
- *SD = San Diego County*
- *RIV = Riverside County*

Threats

Occurrences are located in an area of high recreation use (i.e., adjacent to campsites and campgrounds) but do not appear to be heavily affected. The plant may have some resilience to woodcutting, fire, and low-level ground disturbance, although no formal study of these effects has been conducted. More information is needed on the taxonomic status of the populations on National Forest System lands. Monitoring of populations in areas of high recreation use could verify whether these occurrences are stable or whether active management is needed to protect them. More information is needed on the effects of disturbance on *Monardella nana* ssp. *leptosiphon*.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Monardella nana* ssp. *leptosiphon*:

- Survey all new occurrences of *Monardella nana* ssp. *leptosiphon* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Monardella nana* ssp. *leptosiphon* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Monardella nana* ssp. *leptosiphon* in the Province using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Monardella nana ssp. *leptosiphon* is a southern California endemic, known from scattered occurrences on National Forest System Lands. While none of these occurrences are fully protected from threats, this species has shown a tolerance for moderate levels of disturbance.

Based on the above analysis, *Monardella nana* ssp. *leptosiphon* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Monardella nana ssp. *leptosiphon* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Monardella nana* ssp. *leptosiphon* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Monardella nana* ssp. *leptosiphon* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Monardella macrantha ssp.
hallii**

Monardella viridis ssp. saxicola

Monardella viridis ssp. saxicola

Monardella viridis Jeps. ssp. *saxicola* (I.M.Johnst.) Ewan (Rock monardella)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3T3 S3.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-3

General Distribution

Monardella viridis ssp. *saxicola* occurs in Los Angeles and San Bernardino counties on the southern slopes of the San Gabriel Mountains (California Native Plant Society 2001, Jokerst 1993, Stephenson and Calcarone 1999).

Distribution in the Planning Area

Several occurrences of *Monardella viridis* ssp. *saxicola* are known near one Forest Service road on the San Bernardino National Forest (eastern San Gabriel Mountains) (Stephenson and Calcarone 1999, Lardner pers. comm.). Occurrences are also documented in the San Dimas Experimental Forest on the Angeles National Forest (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Monardella viridis ssp. *saxicola* is a dicot in the mint family (Lamiaceae). It is one of two subspecies of green monardella (*Monardella viridis*) that occur in California (Jokerst 1993). *Monardella viridis* ssp. *saxicola* is restricted to southern California, while subspecies *viridis* occurs in the North Coast Ranges. Rock monardella is one of eight *Monardella* taxa occurring in the Transverse Ranges. It can be distinguished from the other species by leaf, bract, and floral characters (Jokerst 1993).

Monardella viridis ssp. *saxicola* is a perennial rhizomatous herb that blooms June–September (California Native Plant Society 2001).

Habitat Description

Monardella viridis ssp. *saxicola* grows on dry rocky soils in sunny exposed places, including partially shaded gravelly benches and burned areas within chaparral, and in open areas of yellow pine forest, at elevations of 1,640–5,900 feet (500–1,800 meters) (Jokerst 1993, Stephenson and Calcarone 1999).

Occurrence Status

Monardella viridis ssp. *saxicola* is considered to be at risk of extirpation in a portion of its range but is found in sufficient numbers and wide enough distribution that the potential for extinction is low (California Native Plant Society 2001). Its distribution and population trends on National Forest System lands are poorly known (Stephenson and Calcarone 1999).

OCCURRENCE DATA – *Monardella viridus* ssp. *saxicola* (Rock Monardella)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
226097 (RSA)	650 estimated	2004	Along San Sevine Rd. (1N34) from Lytle Creek Rd. stretching from 2.0 miles to 3.5 miles, T1N/R6W/S12 (Fraga/RSA)	SBD

SBD = *San Bernardino County*

Threats

The plant is vulnerable to road-maintenance activities and disturbances that lead to type conversion of its habitat (Stephenson and Calcarone 1999). At least one occurrence is located on private lands and may be vulnerable to development projects (California Native Plant Society 2001).

Conservation and Management Considerations

Relocate known occurrences of *Monardella viridis* ssp. *saxicola* and determine status of populations and habitat. Protect known occurrences from activities that would type convert vegetation.

Evaluation of Current Situation and Threats on National Forest System Lands

Monardella viridis ssp. *saxicola* has a narrow range along the south slopes of the San Gabriel

Mountains. Habitat for *Monardella viridis* ssp. *saxicola*, dry rocky places, helps protect the species from most land uses, and the plants rhizomatous roots, are generally able to withstand incidental impacts and allow the plant to recover from the occasional impacts that occur from dispersed recreation.

Based upon the above analysis *Monardella viridis* ssp. *saxicola* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Monardella viridis ssp. *saxicola* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Monardella viridis* ssp. *saxicola* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Monardella viridis* ssp. *saxicola* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

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Personal communication

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**Monardella nana ssp.
leptosiphon**

Mondarella palmeri

Mondarella palmeri

Monardella palmeri Gray (Palmer's monardella)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3 S2.2 – Threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Monardella palmeri is endemic to Monterey and San Luis Obispo counties (California Native Plant Society 2001).

Distribution in the Planning Area

CalFlora (2002) has records for *Monardella palmeri* at the following locations that are on or near Los Padres National Forest: Santa Lucia Mountains, Cuesta Ridge Botanical Area (6 records) (Painter 2004), Pozo, Rinconada Mine (Jokerst et.al. 2907 (UC)), and Chris Flood Creek. The Forest Service also has records with vague references indicating the presence of three colonies of *Monardella palmeri* in the Villa Creek watershed and in the Salmon Creek (Yadon s.n. (PGM), Painter 2004) and Alder Creek watersheds as well.

Mondarella palmeri is also documented from Los Padres National Forest (Cerro Alto) (Hardham 10831,2 (RSA), Smith 10093 (SBBG)). *Mondarella palmeri* is documented from Fort Hunter Liggett by one specimen collected during the Fort Hunter Liggett floristic survey (Painter 2004).

Mondarella palmeri is documented from Camp San Luis Obispo (Painter 2004), which abuts Los Padres National Forest (Painter & Wetherwax SLO-133 (SBBG), Painter & Wetherwax SLO-149 (SBBG), and Wetherwax & Painter SLO-343 (SBBG)).

Taxonomy and Natural History

Monardella palmeri is a dicot in the mint family (Lamiaceae).

Monardella palmeri is a rhizomatous perennial herb that flowers June–August.

Habitat Description

Monardella palmeri is found in chaparral, cismontane woodland, and with Sargent Cypress, usually on serpentinite substrates, at an elevation of 200 to 800 meters (CalFlora 2002, California Native Plant Society 2001, Matthews 1997). Junak (1991) describes the habitat at Cuesta Ridge as "open slopes and in forest understory."

Occurrence Status

The population status and trend of *Monardella palmeri* is poorly known. According to (Hoover 1970), "plants are not scarce, but seldom bloom except after the ground has been cleared." Junak (1991) indicates that *Monardella palmeri* is frequent in scattered localities throughout the Cuesta Ridge Botanical Special Interest Area along the ridgetop and on the north side of the ridge.

Threats

A couple of occurrences on private land may be threatened by development. There has been no monitoring of occurrences of *Monardella palmeri* on the Los Padres National Forest and therefore there is little information regarding potential threats to the species. Mining and dispersed recreation are two activities that may pose potential threats to *Monardella palmeri* on National Forest System land.

Threats and possible threats at Camp San Luis Obispo include: cattle, non-native plants, military training activities, too frequent fires, fires in wrong season, feral pigs, trampling, soil compaction, dust, and trespassing bicyclists (Painter 2004).

Conservation and Management Considerations

More information is needed on the Los Padres National Forest occurrences of *Monardella palmeri*.

Evaluation of Current Situation and Threats on National Forest System Lands

Monardella palmeri is endemic to the Santa Lucia Mountains and is largely or entirely restricted to serpentine substrates. Where the species occurs on the Los Padres National Forest the land is designated Wilderness or within a designated botanical special interest area and these land use allocations would protect the species from most forms of land management. *Monardella palmeri* is a rhizomatous perennial that is not palatable to livestock and this characteristic provides additional protection for plants found on National Forest System lands.

Based upon the above analysis *Monardella palmeri* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Monardella palmeri* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Monardella palmeri* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

CalFlora: [web application]. 2002. Information on California plants for education, research and conservation. Berkeley, California: The CalFlora Database [a non-profit organization].

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Monardella viridis ssp. saxicola	Muhlenbergia californica
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Muhlenbergia californica

Muhlenbergia californica Vasey (California muhly)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3.

General Distribution

Muhlenbergia californica occurs in Los Angeles and San Bernardino counties across the coastal slopes of the San Bernardino and San Gabriel Mountains (USDA Forest Service 2002). Formerly this species also occupied the San Bernardino Valley, but these occurrences are presumed to be extirpated. The range of *Muhlenbergia californica* may extend to the San Jacinto Mountains in Riverside County (Peterson 1993). Occurrences are known mainly from coastal flowing drainages and canyons, but occurrences have been reported from the southeastern end of the San Bernardino Mountains near the desert interface (CalFlora 2002; USDA Forest Service 2002).

Distribution in the Planning Area

Until recently, *Muhlenbergia californica* was known primarily from a few historical occurrences. More recent occurrences are now known to occur on the San Bernardino and Angeles National Forests (USDA Forest Service 2002). On the Angeles National Forest, occurrences include San Antonio Canyon, South Fork Big Rock Creek, and Strawberry Peak (CalFlora 2002). An occurrence at Coldwater Canyon near Arrowhead Hot Springs is on the San Bernardino National Forest (CalFlora 2002). Many other collection localities are present within the San Bernardino Mountains, mostly along the south side of the mountain range; some of these localities are on National Forest System lands, and others are on private lands adjacent to the National Forest (USDA Forest Service 2002).

Taxonomy and Natural History

Muhlenbergia californica is a monocotyledon in the grass family (*Poaceae*) that blooms July–

September (California Native Plant Society 2001). *Muhlenbergia californica* is a perennial with short, scaly, creeping rhizomes. The stems are 3-7 dm. The ligules are 0.8-2 mm and are truncate, irregularly toothed, and minutely ciliate. The leaf blades are 4-16 cm, 2-6 mm wide, and flat. The inflorescence is 5-13 cm, less than 2 cm wide, and narrow. The inflorescence branches are ascending to erect, short, and densely flowered. The glumes are 2.5-4 mm, acuminate, more or less long-tapered to awned, and the awn is less than 1.2 mm. The lemma is 2.8-4 mm, short soft-hairy on the lower half with hairs less than 1.5 mm, and an awn less than 2.2 mm. The anther is 1-1.5 mm and yellow (Peterson 1993).

Habitat Description

Muhlenbergia californica grows in perennially mesic areas (meadows, seeps, streambanks) within chaparral, coastal sage scrub, and lower montane coniferous forest (California Native Plant Society 2001). Most occurrences are found in the chaparral zone at elevations of 325–6,560 feet (100–2,000 meters) (Peterson 1993).

Occurrence Status

There are ten occurrences listed in CalFlora (2002) with site-specific information; three of these are from the Angeles National Forest.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Muhlenbergia californica* (California muhly)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
1834276	U	1890	Turu Creek (east). Land owner: U.	SBD
1306768	U	1890	East Twin Creek [=Coldwater Cn]. SBNF.	SBD
1834274	U	1993	Coldwater Canyon, ca. 0.5 mi. E of old Arrowhead Hot Springs Hotel. Arrowhead Hot Springs and immediate vicinity. Land owner: U.	SBD
887578, 1379286	U	1881, 1890	San Bernardino. Land owner: U.	SBD

1834275	U	1890	Lytle Creek Zanja. Land owner: U.	SBD
1363192	U	1917	Cold Canyon, Arrowhead Spring, San Bernardino Mtns. Land owner: U.	SBD
1343873	U	1989	Spring Hill near pond; below Baldy Rd, San Antonio Canyon, San Gabriel Mtns. ANF.	LA
1133159	U	1940	Eaton Canyon, San Gabriel Mtns. ANF	LA
1401413	U	1933	South Fork Big Rock Creek, San Gabriel Mtns. ANF.	LA
1344730	U	1992	San Gabriel Mtns 76 ° ENE and 900 m from Strawberry Peak summit. Vicinity of Strawberry Spring. ANF.	LA
602526 (RSA)	30 estimated	2004	Day Cyn. Just past old gaging station on a seep wall, T1N/R6W/S8, elev. 2900-3000 ft.	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

Threats

Habitat for *Muhlenbergia californica* is threatened by water diversion, roads, trails, and recreation activities.

A substantial portion of this species range burned in 2003 in the Old and Grand Prix fires. Fire response is not known, but the burned watersheds may pose a threat of flooding and debris flows to occurrences across the San Gabriel and San Bernardino front country from San Antonio Creek to the Santa Ana

River.

Conservation and Management Considerations

The primary conservation strategy for this species is to improve the knowledge of its distribution. *Muhlenbergia californica* is included in the San Bernardino National Forest Meadow Habitat Management Guide. The following is a list of conservation practices that should be considered for *Muhlenbergia californica*:

- Survey riparian habitat along the coastal drainages for this species and associated rare plants including *Boykinia rotundifolia*.
- Survey all new occurrences of *Muhlenbergia californica* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Muhlenbergia californica* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Muhlenbergia californica* in the four southern California National Forests using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.
- Implement the SBNF Meadow Habitat Management Guide to the greatest extent practicable.

Evaluation of Current Situation and Threats on National Forest System Lands

Muhlenbergia californica is a southern California endemic, known from scattered occurrences and mostly from National Forest System Lands. While none of these occurrences are fully protected from identified threats, several occurrences across the range are not at risk.

Based on the above analysis, *Muhlenbergia californica* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Muhlenbergia californica is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Muhlenbergia californica* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Muhlenbergia californica* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Muhlenbergia californica* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

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Rancho Santa Ana Botanic Garden Herbarium

USDA Forest Service. 2002. "Records on file" at the Big Bear Ranger Station, San Bernardino National Forest.

Muilla coronata

Muilla coronata E. Greene (Crowned muilla)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.2? (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-2

General Distribution

Muilla coronata occurs on the east slope of the Sierra Nevada, in the Great Basin east of the Sierra Nevada, and in the northern and western Mojave Desert (Keator 1993). It is known from Antelope Valley, the El Paso Mountains, the west side of Indian Wells Valley, and near Independence (Munz 1974). In California, *Muilla coronata* occurs in Inyo, Kern, Tulare, Los Angeles, and San Bernardino counties. Its range extends to western Nevada (Keator 1993).

Distribution in the Planning Area

Muilla coronata is known from at least two occurrences along the northern base of the San Bernardino Mountains near the San Bernardino National Forest. One of these occurrences is at the mouth of Marble Canyon, immediately north of the San Bernardino National Forest boundary. The other is at the mouth of Deep Creek. These occurrences are not on the SBNF, although suitable habitat extends from these localities onto NFS land. (USDA Forest Service 2003)

Taxonomy and Natural History

Muilla coronata is a monocotyledon in the lily family (Liliaceae). This plant is a bulbiferous perennial herb and blooms from March to April (California Native Plant Society 2001).

Muilla coronata has leaves that are less than 18 cm. The inflorescence is 3-15 cm, the pedicels are 10-30 mm, and there are 3-10 flowers. The perianth lobes are 3-4 mm, greenish on the outside and white or faded blue on the inside. The stamens are 2-4 mm, the filaments are petal-like, more or less

translucent, much wider at the base, and fused into a cylindrical crown. The anthers are yellow. Fruit are 3-7 mm (Keator 1993).

Habitat Description

On National Forest System lands, *Muilla coronata* inhabits desert montane habitats. It grows on heavy soils in openings within pinyon-juniper woodland, Mojavean Desert scrub, and Joshua tree woodland (California Native Plant Society 2001). Occurrences on the north slope of the San Bernardino Mountains are below 1,525 m (5,000 feet) (USDA Forest Service 2003).

Pinyon-juniper woodland, Mojave Desert scrub, and Joshua tree woodland are well distributed within the plan area; however, there may be specific microhabitat requirements that are much more narrowly distributed. These habitats are affected by ongoing recreational activities, mining, and vehicle use off of designated roads.

Occurrence Status

There are no known occurrences on NFS land. Status of the nearby occurrences is not known.

The following table shows the recorded occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Muilla coronata* (Crowned muilla)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
*	U	U	Marble Canyon at N boundary of SBNF. Priv.	SBD
*	U	U	Mouth of Deep Creek. Priv/ACE?	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBD = San Bernardino County*

Threats

There are no known occurrences within the southern California National Forests. Therefore no threats are identified. If this species occurs on the lower desert slopes of the SBNF or ANF it could be

impacted by mining and OHV travel off designated roads and trails.

Conservation and Management Considerations

The priority conservation strategy for this species is to determine the current status of the recorded occurrences adjacent to the SBNF (in cooperation with landowners), and to improve the knowledge of this species' distribution on the Forest by performing focused surveys of suitable habitat. The following is a prioritized list of conservation practices that should be considered for *Muilla coronata*:

- Survey lower desert slopes near recorded occurrences near the Forest for *Muilla coronata*. Record occurrence status, habitat condition, and threats. Surveys should include Arctic, Marble and Furnace Canyons, and areas of Deep Creek along the PCT.
- Collect a herbarium voucher specimen of *Muilla coronata* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in the last ten years.
- Map known and new occurrences of *Muilla coronata* in the southern California National Forests using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Muilla coronata is a rare plant that is relatively widespread in the western Colorado Desert on California, but it is sparsely distributed with relatively few records and rarely in large numbers. Two historic records are near the SBNF, and suitable habitat near these localities exists on the SBNF.

Based on this analysis, *Muilla coronata* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes for National Forest System Lands

Muilla coronata is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Muilla coronata* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Muilla coronata* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Muilla coronata* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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USDA Forest Service. 2003. "Records on file" at the Big Bear Ranger Station, San Bernardino National Forest.

Muhlenbergia californica

Nasturium gambelii

Nasturtium gambelii

Nasturtium gambelii (S. Watson) O. E. Schulz (Gambel's water cress)

Management Status

Federal: Endangered

California: Threatened

Heritage Rank: G1; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-2

General Distribution

Historically, *Nasturtium gambelii* was reported from four sites in coastal San Luis Obispo County, two in Santa Barbara County, one in San Bernardino County, and three in Mexico. All currently known occurrences of *Nasturtium gambelii* are known from coastal San Luis Obispo County. Only three occurrences are known to be extant: Oso Flaco Lake (over 600 plants in 1998), Black Lake Canyon (500 plants in 1994), and at Vandenberg Air Force Base (less than 100 plants in 1996) (California Natural Diversity Database 2004).

Distribution in the Planning Area

There are no known occurrences of *Nasturtium gambelii* on National Forest System lands; however, potential habitat is present in a marsh at Arrowhead Hot Springs near the San Bernardino National Forest. Arrowhead Hot Springs is approximately 9 miles (14.5 km) north of the location of historical collections in the vicinity of San Bernardino (USDI Fish and Wildlife Service 1998). Historically, the area of San Bernardino near the current junction of Interstates 10 and 215 was marshland, known as Urbita Hot Springs. *Nasturtium gambelii* was last collected from that location in 1935 (USDI Fish and Wildlife Service 1998). The Arrowhead Hot Springs site currently supports many of the same species as were historically collected at Urbita Hot Springs (Rancho Santa Ana Botanic Gardens herbarium records). Another occurrence was reported in 1983 from the Pine Hills southwest of Julian, possibly on or near the Cleveland National Forest (California Natural Diversity Database 2004). The Pine Hills report was likely based on a misidentification of common watercress (*N. officinale*) (California Native Plant Society 2001).

Taxonomy and Natural History

Nasturtium gambelii is a dicotyledon in the mustard family (Brassicaceae). It belongs to a group of species that are taxonomically difficult to determine because they share similar morphological features. *Nasturtium gambelii*, originally described as *Cardamine gambelii*, was later renamed *Rorippa gambelii*, and was treated as *Rorippa gambelii* in *The Jepson Manual* (Rollins 1993), and in the federal listing package for this species. In a recent reevaluation of the genus *Nasturtium*, Al-Shehbaz and Price (1998) determined that the genus *Nasturtium* warranted recognition and that *Rorippa gambelii* should be treated as *Nasturtium gambelii*.

Nasturtium gambelii is a perennial, rhizomatous, branched herb with an extended flowering period of May-October, peaking in July. It produces dense inflorescences (flower clusters) with white flowers. Self-pollination may occur. Each plant produces an average of 882 seeds. Seedlings begin emerging in April. Information regarding pollinators, seed germination and dispersal, and seedling recruitment is lacking (USDI Fish and Wildlife Service 2001).

Nasturtium gambelii has erect to decumbent, branched, 5-20 dm stems and 0 to dense, flat hairs. The leaves are 1-pinnate. The petiole has small lobes more or less at the base. The 7-13 leaflets are sessile, 5-25 mm, more or less linear to round, prominently dentate, and have an acute tip (Rollins 1993).

Nasturtium gambelii is distinguishable from the look-alike species *Nasturtium officinale* R. Br. (formerly *Rorippa nasturtium-aquaticum* L). *Nasturtium officinale* has 3-7 leaflets that are entire or wavy-margined and smaller than the terminal leaflet. The leaflets in the upper leaves are also more lobed than angular. In addition, the flower pedicels lack bracts or flat stem junctions, and the fruit have seeds in two rows per chamber (USDI Fish and Wildlife Service 1998).

Habitat Description

Nasturtium gambelii historically occurred in wetland areas in standing water or saturated soils from sea level to 1,480 feet (451 m). *Nasturtium gambelii* is currently found in freshwater or brackish marsh habitats at the margins of lakes or along slow-flowing streams at elevations of 20-60 feet (6-18 m). Soils are saturated, acidic bog soils, but generally lack standing water. Soils are covered in heavy plant litter, are predominantly sandy, and have a high organic content. Water is generally present about 15 cm below the surface. *Nasturtium gambelii* requires a permanent water source, and habitat is often associated with dunes or back-dunes. Associated species include *Rubus ursinus*, *Typha* sp., *Sparganium eurycarpum*, and *Scirpus americanus*.

Suitable habitat for *Nasturtium gambelii* is highly restricted on National Forest System lands. Wetlands throughout southern California continue to be threatened by habitat conversion.

Occurrence Status

Many occurrences have been extirpated as the result of habitat conversion. *Nasturtium gambelii* is restricted to a few, tenuous populations in coastal San Luis Obispo County and central Mexico. The species remains at high risk of extinction because of the very small number of individuals and populations that remain. (USDI Fish and Wildlife Service 1998).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Nasturtium gambelii* (Gambel's watercress)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
4	U	1935	San Bernardino Valley (Urbita Hot Springs). This swamp was drained by 1945, and it soon became sand and cottonwoods (and later, a shopping mall). Extirpated. PVT.	SBD
6	U	U	Pine Hills, SW of Julian. Location information is vague. PVT. [likely mis-identified]	SD

- *U = Unknown*
- *SBD = San Bernardino County*
- *SD = San Diego County*
- *PVT = private land ownership*

Threats

No occurrences are known from the planning area, so no threats are identified. If the species is extant at (or introduced to) Arrowhead Hot Springs, watershed management on National Forest System lands above the private wetlands could affect the habitat.

Conservation and Management Considerations

A recovery plan has been written and implemented for *Nasturtium gambelii*. The following is a prioritized list of conservation practices that should be considered for *Nasturtium gambelii*:

- In cooperation with the owner of Arrowhead Hot Spring, survey the wetlands for this and

associated rare plants.

- If the species is absent from Arrowhead Hot Springs, and at the initiative of the Fish and Wildlife Service, assess the site for potential introduction in cooperation with the landowner and FWS.
- Collect a herbarium voucher specimen of *Nasturtium gambelii* to document any new occurrences.
- Map known and new occurrences of *Nasturtium gambelii* in the Province using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Nasturtium gambelii is a nearly-extinct species that is currently known in the United States only to occur in back-dune wetlands in coastal San Luis Obispo county. A historic record is near the San Bernardino National Forest, and suitable habitat near these localities exists adjacent to the San Bernardino National Forest.

Based on this analysis, *Nasturtium gambelii* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

Nasturtium gambelii is listed under the Endangered Species Act of 1973, as amended, as endangered, which assures that on NFS lands, any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

No populations of *Nasturtium gambelii* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Nasturtium gambelii*.

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Muilla coronata

Navarretia peninsularis

Navarretia peninsularis

Navarretia peninsularis Greene (Baja navarretia)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G3? S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-2

General Distribution

Navarretia peninsularis occurs in the Breckenridge Mountains of Kern County; in the San Rafael Mountains of Santa Barbara County; the western Transverse Range in Kern and Ventura counties; the San Bernardino Mountains of San Bernardino County; and south to Baja California (Day 1993). The California Natural Diversity Database (2004) documents six occurrences in San Diego, San Bernardino, Santa Barbara, and Kern Counties, all from 1965 or earlier.

Distribution in the Planning Area

Navarretia peninsularis is known to occur at six locations on the Los Padres National Forest: one on the northeast flank of Mount Pinos (Calflora 2002, Foster 2003a); two in Little Cuddy Valley at the toe of Frazier Mountain (Foster 2003b, Foster 2003c), three others on the north slope of Frazier Mountain above Chuchupate Ranger Station (Foster 2003d, Foster 2003e, Foster 2003f) a fourth location near San Guillermo Mountain (Foster 2003g), a fifth in Lockwood Valley (Foster 2003h), and a sixth on Big Pine Mountain in the San Rafael Wilderness (Calflora 2002).

Within the boundary of the San Bernardino National Forest, locations are known from the north and west ends of Baldwin Lake, Holcomb Valley, the west edge of Arrastre Flats, Saragossa Creek, and Union Flat (Krantz et. al. 1995). Most of these locations most likely occur on NFS lands however land ownership of the Baldwin lake occurrences is not known at this time. A more recent discovery was made on the Forest in Belleville Meadow (Stephenson and Calcarone 1999). It was also known from Pine Knot, now down town Big Bear Lake (Krantz et.al. 1995).

In San Diego County, two occurrences are in Cuyamaca Rancho State Park adjacent to the Cleveland National Forest.

Taxonomy and Natural History

Navarretia peninsularis is a dicot in the phlox family (Polemoniaceae). *Navarretia peninsularis* can be distinguished from similar congeners by the shape of the leaves and bracts, corolla color, and presence of glandular hairs (Day 1993).

Navarretia peninsularis is an annual herb that blooms June-August (California Native Plant Society 2001).

Habitat Description

Navarretia peninsularis grows in mesic openings in chaparral, pinyon woodland, and Jeffrey pine forest. In some locations, plants are found along vernal creeks, in meadows, and in snowmelt seeps within pinyon-juniper woodland and yellow pine forest (Reiser 1994). Twisselmann (1995) describes the plant's habitat as "disturbed loam in the meadow at Breckenridge Public Camp."

On the Los Padres National Forest, *Navarretia peninsularis* grows in open to moderately dense stands of annual herbs and often *N. peninsularis* is found in the understory of this herb layer. Taller annuals, such as *Lessingia*, *Linanthus*, and *Lotus*, provide the overstory. As a result, *N. peninsularis* is often easily overlooked and not easily detected. These stands of annual plants are generally found adjacent to and just upslope from moist or wet meadows where there is a continuous or nearly continuous cover of perennial herbs and associated leaf litter. *Navarretia peninsularis* is also found in ruderal sites such as roadsides, road ditches, lightly used vehicle tracks, and disturbed patches in meadow vegetation. On the San Bernardino National Forest, this taxon is found within wet meadow habitat.

Occurrence Status

Navarretia peninsularis has a limited distribution on National Forest Service lands, but its overall numbers appear stable (Reiser 1994). At Breckenridge Public Camp in Kern County *Navarretia peninsularis* was reported as being abundant (Twisselmann 1995).

On the northeast flank of Mount Pinos, *Navarretia peninsularis* is found in small vernal swales that are very limited in distribution. In 2003, there were about 10,000 plants at this location. In Little Cuddy Valley, habitat for *Navarretia peninsularis* is also limited in distribution and the number of plants present in 2003 was estimated at about 5,000 plants. Three other occurrences are found on the north slope of Frazier Mountain and these too each consisted of about 10,000 plants if not more. Further west, near San Guillermo Mountain, *Navarretia peninsularis* is found in several scattered colonies that combined consist of over 10,000 plants. The occurrence of plants in Lockwood Valley was comprised of about 1,200 plants.

On the San Bernardino National Forest, *Navarretia peninsularis* that co-occur with listed plant taxa in Belleville Meadow received an increased level of protection from projects completed under the Southern California Conservation Strategy between 1998 and 2002. An unauthorized trail was barricaded and allowed to recover naturally and access to an unauthorized road was re-fenced and signed within Belleville Meadow. Other locations in this vicinity have also benefitted from similar actions to protect wet meadow habitat. Despite these actions some locations continue to be affected by high levels of recreational use in Holcomb Valley.

Threats

Navarretia peninsularis has high vulnerability on the San Bernardino National Forest. Gold prospecting activities and vehicle traffic may be negatively affecting the Holcomb Valley site on the San Bernardino National Forest. Other potential threats include dispersed recreation activities.

On the Los Padres National Forest, *Navarretia peninsularis* has low vulnerability. At one location (Mount Pinos), *Navarretia peninsularis* is found in an area used informally for winter snow play but no impacts from this use were noted during monitoring in June 2003. One location in Little Cuddy Valley is located on private land and this land is currently not in use and does not appear to have been affected by any historic land uses. The second location is found on National Forest System land and this land is not in any current use other than scenery. Three recent discoveries on the north slope of Frazier Mountain and a fourth discovery near San Guillermo Mountain occur in areas subject to low intensity impacts from dispersed recreation, impacts such as foot traffic, parking of vehicles at road edges, building of fire rings, and abandonment of litter. None of these three occurrences are threatened by extirpation from these activities though mortality likely occurs each year to a number of plants as a result of this use. Habitat quality at all of the sites on National Forest System land is considered good (Foster 2003a, 2003b, 2003d, 2003e, 2003f, 2003g, 2003h). The location on Big Pine Mountain has not been visited since 1946 (California Natural Diversity Database 2004) and is therefore vulnerable due to a lack of knowledge regarding the precise location the occurrence.

Conservation and Management Considerations

- Relocate occurrence on Big Pine Mountain and determine its status.
- In Holcomb Valley, determine extent of threat posed by gold prospecting and vehicle traffic, and determine whether dispersed recreation is affecting *Navarretia peninsularis*.
- Conduct additional monitoring of occurrences on the Los Padres National Forest in order to gather comprehensive information on the status of new occurrences discovered in 2003.

Evaluation of Current Situation and Threats on National Forest System Lands

Navarretia peninsularis, although locally abundant in suitable habitat, is uncommon in the planning area being known from only seven locations on National Forest System land. It has a disjunct distribution --

small number of occurrences are found in at least seven mountain ranges. Except in Holcomb Valley on the SBNF, occurrences on National Forest System land are not threatened and there are no documented threats to distribution or persistence. This taxon is included in the San Bernardino National Forest Meadow Habitat Management Guide and although some threats are continuing most of the known habitat is expected to benefit over the long-term from actions completed under the Southern California Conservation Strategy. In addition, a majority of the San Bernardino occurrences are within the existing Holcomb Valley/North Baldwin Lake Special Interest Area.

Based upon the above analysis *Navarretia peninsularis* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral to plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Navarretia peninsularis is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Navarretia peninsularis* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Navarretia peninsularis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Nasturium gambelii

Nolina cismontana

Nolina cismontana

Nolina cismontana Dice in edit. (Chaparral beargrass)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G1, S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B, R-E-D Code 3-2-3

General Distribution

Nolina cismontana is distributed in coastal drainages and foothills below 3000 feet from Ventura to Orange counties, with a few isolated populations in San Diego County (Dice 1988). Occurrences are known from the foothills of the Santa Ynez Mountains, south through the Simi Hills and Santa Ana Mountains to the foothills west of the Pala, Palomar, Viejas, and Cuyamaca Mountains (Stephenson and Calcarone 1999).

Distribution in the Planning Area

Nolina cismontana occurs in a handful of patchy locations within the Cleveland National Forest (Reiser 1994, Hess and Dice 1995, Stephenson and Calcarone 1999). A "colonial population of 30-40? plants, to 5 ft., in flower on gravelly southwest slope in Sespe Red Bed Formation, about chaparral in foothills of Santa Ynez Mtns. off west fork of upper Santa Ana Creek west of Ojai (courtesy of John Taft), first collected by Alice Eastwood in Apr 1916. Simi Hills to San Diego Co. Fruiting in June" was reported by Smith (1998). This occurrence is either on the private property (the Taft property) or Ojai Ranger District.

Taxonomy and Natural History

Nolina cismontana is few to many-branched shrub (sub shrub), 18 – 54 inches tall, originating from a woody caudex, branching both above and below ground. Mature rosettes, 0.7 to 1.6 m diameter, having 30 to 90, green, lance-linear, occasionally glaucous, 0.5 to 1.4 m long by 1.2 to 3 cm wide, serrulate leaves. Large panicle inflorescences grow to approximately 3 m by 10-40 cm, with stalks ranging from

1.4 to 3.5 cm diameter and forming 25 to 75 secondary branches 13 to 35 cm in length. Inflorescent bracts are large (10-40 cm by 1.5-5 cm), conspicuous, persistent, and lance-linear to deltoid lanceolate. Individual flower petals are cream to white, ovate, rounded and papillate at tip; staminate sepals 3 to 5 mm by 1.5 to 2.5 mm, pistillate sepals 3 to 4 mm by 2 mm. Staminate flowers broadly campanulate to recurved at anthers, stamens 2 to 4 mm, styles and stigma greatly reduced, ovary on short stalk above perianth (0.5-1.5, by 1-1.5 mm). Pistillate flowers erect to campanulate at anthesis, stamenoïdes 1 to 2 mm long, styles appressed but distinct, ovary on short stalk above perianth (3mm by 2-3 mm). *Nolina cismontana* produces papery, 3-lobed capsules that are emarginated at base and apex. Fruits burst irregularly to expel ovoid to oblong 4 to 5 mm by 3 to 4 mm reddish brown seeds (Hess and Dice 1995; Dice 1988).

Habitat Description and Status

Nolina cismontana primarily occurs in open chaparral and Diegan Sage Scrub with xeric sandstone and gabbro-based substrates (Reiser 1994, Stephenson and Calcarone 1999). Orange County populations have been observed on Cienega soils where erosion is substantial; Las Posas fine sandy loams are mapped for the San Luis Rey River population. This *Nolina* species is also reported utilized are other soil types including Lodo, Calleguas-Arnold complex, and Anaheim (Reiser 1994).

Occurrence Status

Nolina cismontana is known to occur on National Forest System lands. Protected occurrences of significant size exist on Viejas Mountain, in the Coal Canyon Ecological Reserve in the Santa Ana Mountains, and in scattered populations on the Trabuco Ranger District of the Cleveland National Forest (Stephenson and Calcarone 1999). Occurrences shown below are incidental sighting reports and do not represent all potential occurrences on National Forest System lands.

OCCURRENCE DATA of *Nolina cismontana* (Chaparral beargrass) on National Forest lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
*	2-1	200 +	1990	Viejas Mt. / CNF	SD
*	2-2	U	1990	South of Silverado Canyon / CNF	OR
*	2-3	200 +	1990	South of Wardlow Canyon / CNF	RIV

*	*	U	1990	Between Live Oak and Silverado Canyons / CNF	SD
*	2-5	100s	1991	Viejas Mt. / CNF	SD
*	2-4	400	1993	South of Blackstar Canyon/ CNF	OR
*	2-6	1000 +	1995	Hot Springs Canyon / CNF	OR
*	2-7	+/- 90	2001	Viejas Mt. / CNF	SD
*	*	U	U	Santa Ana Creek / LPNF ?	SB

- U = Unknown.
- * an occurrence number has not been assigned.
- SBNF = San Bernardino National Forest
- CNF= Cleveland National Forest
- LPNF = Los Padres National Forest
- OR = Orange County
- RIV = Riverside County
- SD = San Diego County

Threats

Residential and commercial land developments threaten this *Nolina* species throughout most of its range (Stephenson and Calcarone 1999), including expansion of transportation corridors and land conversion for agricultural purposes (Reiser 1994).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Nolina cismontana*:

- Monitor known populations.
- Survey recently burned areas on coastal slope below 3000 feet to detect new emergence/ occurrences and map and documents in the Sensitive Species Plant Atlas.
- Determine if this taxon occurs on the Los Padres National Forest

Evaluation of Current Situation and Threats on National Forest Systems Lands

Nolina cismontana is patchily distributed on the Cleveland National Forest, mainly on sandstone and gabbro-derived soils, and may occur on the Los Padres National Forest. No substantial threats to its persistence from Forest Service activities have been identified. The species may be a fire follower and could benefit from prescribed burning in older age stands in its habitat. Vulnerability of *Nolina cismontana* on National Forest System lands is considered to be low, and specific risks have not been identified (Stephenson and Calcarone 1999).

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Nolina cismontana is a USDA Forest Service, Region 5 Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Occurrences of *Nolina cismontana* on National Forest System lands have large population numbers and are well protected with no apparent threats. The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Nolina cismontana*. Variations in land use designations would not alter this current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this species. *Nolina cismontana* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Lands within Range of Taxon

Nolina cismontana is considered to have low to moderate vulnerability across its range. Occurrences of this species on private lands are distributed in areas with high potential for impacts associated with urbanization. Proximity to urban areas and a natural patchy distribution may result in compromised habitat quality and reduced population occurrences for this chaparral species in the future (Reiser 1994). By maintaining the current distribution of *Nolina cismontana* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Nolina cismontana* to suffer a decline in its overall distribution.

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Navarretia peninsularis

Nolina interrata

Nolina interrata

Nolina interrata Gentry (Dehesa nolina)

Management Status

Federal: None

California: Endangered

Heritage Rank: G1, S2.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B R-E-D Code – 3-3-2

General Distribution

Nolina interrata, Dehesa Nolina occurs in the southwest Peninsular Ranges of San Diego County and in Baja California, Mexico (Dice 1993). In California, it occurs in approximately 10 locations in the Dehesa Valley (California Native Plant Society 2001).

Distribution in the Planning Area

There are no known occurrences of *Nolina interrata* on National Forest System lands, although suitable habitat is present on the Cleveland National Forest (Stephenson and Calcarone 1999). However, all of gabbro peaks in the southeastern part of the Cleveland National Forest have been extensively surveyed, and no sign of this large, conspicuous perennial species has been found (Winter pers. comm.). All recorded populations are located west of the Forest (California Natural Diversity Database 2004, Stephenson and Calcarone 1999).

Taxonomy and Natural History

Nolina interrata is a monocot in the Lily family (Liliaceae). This dioecious tree-like shrub branches below ground, forming an above ground platform of rosettes. Rosettes are comprised of 10 to 45 leaves, each of which are 12 to 30 mm wide just above an expanded base and generally glaucous with minutely serrate margins. The scapose panicle is less than 4 m tall and is 5 to 16 dm wide; the axis is 5-16 mm at base and bracts are generally inconspicuous and persistent. The whitish perianth has parts in 6, in two petal-like whorls. There are 6 stamens with slender filaments, and the 3-chambered superior ovary has 2

ovules per chamber. The style and 3 stigmas are short. The fruit is a papery capsule with 1 to 3 ovoid, reddish brown seeds that are 4 to 6 mm (Dice 1993).

Habitat Description

Nolina interrata occurs in association with gabbro soils (Stephenson and Calcarone 1999, Dice 1993), on Las Posas stony fine sandy loams (Reiser 1994), and sometimes on metavolcanic or serpentine soils (California Native Plant Society 2001; California Natural Diversity Database 2004). The species is found in open chaparral at elevations of 650–2,275 feet (200-700 meters), typically on hillsides or ravines. Near the Dehesa School a series of fires have left stands of this *Nolina* in disturbed annual grassland (Reiser 1994).

Occurrence Status

Nolina interrata is not known to occur on National Forest System lands. Nine populations occur in San Diego County, all within a 6-square mile area in the Dehesa Valley, east of the town of El Cajon. Protected populations at McGinty Mountain, managed by The Nature Conservancy, and at Sycuan Peak, managed by California Department of Fish and Game, constitute two-thirds of all documented occurrences and include 90-100 percent of all major populations. Remaining occurrences are small and located on private land (U.S. Fish and Wildlife Service 1998).

Threats

The primary threats to *Nolina interrata* are residential development and horticultural collecting (California Native Plant Society 2001). Non-native grass invasion may also be a threat at the location near Dehesa School where frequent consecutive fires may promote type conversion to non-native annual grasses (Reiser 1994).

Conservation and Management Considerations

It is unlikely that this species occurs on National Forest System lands; therefore, its conservation will depend on measures taken elsewhere. The following is a list of conservation practices that should be considered for *Nolina interrata*:

- No conservation measures are recommended within the Cleveland National Forest.

Evaluation of Current Situation and Threats on National Forest Systems Lands

Potential habitat for *Nolina interrata* on the Cleveland National Forest has been surveyed, but the species has never been found. All known occurrences are west of National Forest System lands.

Based upon the above analysis this species has been assigned the following threat category:

1. Not found in the Plan area.

Viability Outcome

No populations of *Nolina interrata* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Nolina interrata*.

Literature Cited

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Nolina cismontana

**Opuntia basilaris var.
brachyclada**

Opuntia basilaris var. brachyclada

Opuntia basilaris Engelm. & J. Bigelow var. *brachyclada* (Griffiths) Munz (Short-joint beavertail)

Management Status

Federal: Forest Service Sensitive, Federal Species of Concern

California: None

Heritage Rank: G5T1; S1.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

Acknowledgement: Much of this account was derived from the species account prepared by Pam MacKay for the BLM West Mojave Plan.

General Distribution

Opuntia basilaris var. *brachyclada* occurs primarily along the northern slopes of the San Gabriel Mountains. Plants from the Anaverde Valley and west appear to have intermediate morphology, and are probably intergrades with *Opuntia basilaris* var. *basilaris* (A. Sanders, pers. comm. 1997; S. Myers, pers. comm. 1997). There are several reports east of Cajon Pass in the northern San Bernardino Mountains, extending through Horsethief Canyon and Summit Valley to the Mojave River Forks south of Hesperia. It also occurs on the coastal slope of the transverse ranges in the Cajon Pass area at Mormon Rocks. *Opuntia basilaris* var. *brachyclada* has also been reported from Vulcan Mountain in San Diego County, also a long distance from the taxon's main range (Benson 1969).

Distribution in the Planning Area

There are 56 total occurrences of *Opuntia basilaris* var. *brachyclada* (California Natural Diversity Database 2004): 30 are on the Angeles National Forest and seven are on the San Bernardino National Forest. It occurs from Quigley Canyon east-northeast to the Anaverde Valley west of Palmdale. From there, it appears to more or less follow the San Andreas rift zone to the Cajon Pass, although it departs somewhat from the rift zone near Mill Creek Summit within the Angeles National Forest. It occurs mostly at elevations between 3,000-6,500 ft. (900-2,000m). *Opuntia basilaris* var. *brachyclada* is reported in the Anaverde Valley just west of Palmdale, and from there it follows the San Andreas rift zone in the Angeles National Forest southeast to Largo Vista. East of Largo Vista, its distribution on

BLM land is mostly north of the rift zone near the Forest Service boundary to near Mountain Top junction of Hwy 138 and Hwy 2. Scattered plants have been observed within the area in south Phelan, east of Mountain Top, for several miles along the Forest Service boundary. Plants then reappear near Cajon Summit (and south through the Cajon pass to Cleghorn and Mormon Rocks), Oak Hills, and Baldy Mesa. From there, *Opuntia basilaris* var. *brachyclada* extends east through Horsethief Canyon, mostly within the San Bernardino National Forest, but sometimes extending onto BLM land. Its easternmost reported occurrence is near the Mojave River Forks dam at Deep Creek.

Taxonomy and Natural History

Opuntia basilaris var. *brachyclada* is a member of the cactus family (Cactaceae), and more specifically fits within the sub-genus *Platyopuntia* of the genus *Opuntia*, having flattened joints and no tubercles. It has bluish-gray stems with no spines, but possesses glochids borne on areoles 0.2-0.6 inches (0.5-1.5cm) apart. The fruit is dry at maturity. Flowers have magenta to rose-colored perianth segments and white stigmas, and are clustered at the ends of joints. Variety *brachyclada*, first described by Griffiths (1914), is distinguished from other members of the species by having small joints which are 0.12-2.4 inches (3-6 cm) long, rather than the 2.8-6.0 inch (7-15 cm) long joints possessed by other members of this species. These joints are often almost cylindrical and club-shaped instead of flattened (Parfitt & Baker 1993; Munz 1974), but older joints within a clone seem to flatten as they age. Fruits are also smaller at 0.4-0.8 inches long. Flowers, however, are not always smaller; plants in pinyon-juniper woodland in Pinon Hills have been observed with flowers as large as those of other varieties. It flowers in May to June, a month later than other varieties, and has been called the 'snow flower cactus' because flowering follows snowmelt in pinyon woodland (Dawson 1966).

The characteristics that distinguish the short-joint beavertail from var. *basilaris* are at least in part due to genetic differences, since some individual plants of both varieties maintain distinct phenotypes when growing sympatrically, as in Horsethief Canyon (MacKay and Sanders 1977).

The short-joint beavertail is well adapted to drought, as are most cacti, by minimizing surface areas to prevent water loss, having a succulent habit and slime substances to draw water into tissues, and undergoing specialized Crassulacean acid metabolism to minimize water loss during photosynthesis. Their shallow corky root systems, which only develop root hairs when water is available, also help them cope with drought. However, it has been suggested that these shallow root systems also make them vulnerable to disturbance from above-ground activities such as vehicle and foot traffic (Mistretta and Parra-Szjij 1991).

Like all of the southwestern *Platyopuntias*, *Opuntia basilaris* var. *brachyclada* flowers are large, bowl-shaped, have many brightly-colored perianth segments, many touch-sensitive stamens, and a massive central style and stigma. Transfer of pollen by vectors is probably important in this taxon, as it is in many protandrous cacti (Mistretta and Parra-Szjij 1991). Flowers with this pollination syndrome were previously thought to be beetle-pollinated (Faegri and van der Pikel 1979; Grant and Hurd 1979), and indeed, beetle visitors are very commonly reported in these flowers. However, more recent studies have

shown that the beetles found in cactus flowers do not frequently contact stigmatic surfaces, and that medium-sized and larger bees are the important regular pollinators of this and other *Platyopuntias* (Grant and Grant 1979; Grant and Hurd 1979).

The presence of what appear to be hybrid swarms, especially east of Cajon Pass in Summit Valley, would suggest that viable seeds are produced by crosses with var. *basilaris*. Both varieties are diploid with the same chromosome number ($2n=22$) (Pinkava, et. al. 1977). Cloning is also evident in *Opuntia basilaris* var. *brachyclada* from the formation of spreading patches of this taxon in some areas. It has been suggested that patch width might be used to estimate ages of plants, although growth rates and longevity of this taxon are not known. However, most plants don't produce multiple joint segments that will break off and be dispersed, so cloning may be limited. The juicy brightly colored fruits of *Opuntia basilaris* var. *brachyclada* are most likely to be dispersed by birds, but the seeds do not appear to germinate within the fruit itself, probably due to the presence of chemicals in the pulp that inhibit seed germination. Seeds might be eaten by insects, rodents, and birds. Cochineal insects (*Dactylopius coccus*) have been observed on the short-joint beavertail, but they do not appear to threaten the survival of the plants (Mistretta and Parra-Szizj 1991).

Most species of *Opuntia* evolved in areas where they were not subjected to frequent fires. It has been suggested that the rapid infiltration of desert ecosystems by introduced grasses most likely increases fire frequency, and this may decimate some *Opuntia* species (Sauer 1988). Introduced European grasses are increasing their range and numbers within the range of *Opuntia basilaris* var. *brachyclada*, especially in the Cajon Pass area, Oak Hills, Phelan, and Pinon Hills, and also around Palmdale. This will most likely alter future fire frequency, but it is unclear if this increased frequency will pose a threat to *Opuntia basilaris* var. *brachyclada*. In addition, prescribed burning has been planned in desert chaparral areas within the range of this taxon (Mistretta and Parra-Szizj 1991). These cacti can apparently survive at least a single burning incident. A resident of Pinon Hills reported that several large patches of this plant on her property at 5000 ft. burned completely in the Scout Fire of June 1994. They have now resprouted from patch edges, but have not yet flowered.

Habitat Description

Opuntia basilaris var. *brachyclada* is known to occur in chaparral, Joshua tree woodland, Mojave Desert scrub, and pinyon-juniper woodland communities at elevations of 3,000-6,500 ft. (900-2,000 m). Within the Angeles National Forest, it is associated with *Adenostoma fasciculatum*, *Ceanothus crassifolius*, *Ceanothus greggii* var. *vestitus*, *Yucca whipplei* ssp. *caespitosa*, *Platanus racemosa*, *Ceanothus leucodermis*, *Arctostaphylos glauca*, *Rhus ovata*, *Garrya veatchii*, *Artemisia tridentata*, *Sambucus mexicanus*, *Chrysothamnus nauseosus*, and *Eriodictyon trichocalyx*. It has been reported from a variety of soils, from sandy to rocky, in open stream beds, alluvial fans, and on rocky slopes (CNDDDB 2004).

Occurrence Status

Mistretta and Parra-Szizj (1991) have conducted surveys for *Opuntia basilaris* var. *brachyclada* within

the Angeles National Forest. They counted a total of approximately 900 plants at fifteen localities, two of which were within the boundaries of the San Bernardino National Forest. Plants were found in the Tujunga and Valyermo districts of the Angeles National Forest and in Lone Pine Canyon in the San Bernardino National Forest.

MacKay and Thomas (1997) recently discovered a large population of at least several hundred plants further up the Big Rock Creek drainage at 5,250 ft. (1,600 m) elevation. These plants are on private land at the old Paradise Springs Camp, and the naturalist at that camp has been notified. A smaller and less dense population was observed at South Fork Campground in the Angeles National Forest. It is likely that *Opuntia basilaris* var. *brachyclada* also occurs along Rock Creek between Pearblossom and South Fork Campground, but this has not been documented.

A large population on Largo Vista Road, near Hwy. N-4 extends slightly over the Angeles National Forest boundary into the WMPA. Mistretta and Parra Szijj (1991) reported 140 plants for the whole population. Several populations occur in Mescal Canyon (CNDDDB 2004), but there are no population size data available. MacKay has frequently observed *Opuntia basilaris* var. *brachyclada* at many scattered locations in Pinon Hills and south Phelan. Plants were never dense in these areas, and population data were not taken. A population of 150 plants onto BLM land from the Angeles National Forest in Horse Canyon was reported by Mistretta and Parra-Szijj (1991).

The Quigley Canyon occurrence appears to consist of intergrades between *Opuntia basilaris* var. *brachyclada* and *O. basilaris* var. *basilaris*. In 1989 Myers (CNDDDB 1997) reported four locations at City Ranch in the Anaverde Valley west of Palmdale, many of which appeared to be intergrades with *O. basilaris* var. *basilaris*. One of these locations had 300 plants, while another had 12. There are no further population data for these locations. A population with at least 23 individuals was found south of Palmdale near an air strip in an area a developer retained as natural open space (CNDDDB 1997; S. Myers pers. comm. 1997), but there is no current information on the status of that population.

MacKay and Sanders (1997) have observed populations of 25 or more individual plants in Horsethief Canyon east of Cajon Pass, along the Pacific Coast Trail. Many of these plants appear to be intergrades with *O. basilaris* var. *basilaris*, although some specimens retain all of the characteristics of var. *brachyclada*. Myers (pers. comm. 1997) also has found *Opuntia basilaris* var. *brachyclada* populations at Las Flores Ranch, Grass Valley, and Deep Creek Dam, but population sizes were not assessed.

MacKay and Thomas reported an occurrence at the Cleghorn Alluvial Fan, East of I-15 near the confluence of Cleghorn Ck and Cajon Ck. This occurrence had burned and some plants were observed resprouting in the first post-fire spring.

Most of the habitat for this species from the Cajon Pass east burned during in 2002 and 2003, primarily in the Louisiana/Bluecut Fires and the Grand Prix/Old Fires. Occurrence status for this area is not yet known.

It is likely that the distribution of *Opuntia basilaris* ssp. *brachyclada* is wider than what is described here. Much of the land within the species range is privately owned, making field surveys difficult.

The following table shows the recorded occurrences in/near the southern California National Forests, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Opuntia basilaris* var. *brachyclada* (Short-joint beavertail)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1950	Near Ranger (Guard) Station, near top of Cajon Pass. Land ownership: U	SBD
2	U	1916	Summit of Cajon Pass. Land ownership: U	SBD
4	U	1899, 1931	Lone Pine Canyon, 2.5 mi. below summit of grade to Swarthout Valley, San Gabriel Mtns. In vicinity of Clyde Ranch.	SBD
5	105 in 1990	1936, 1990	Mescal Creek, E of Big John Flat, N slope San Gabriel Mtns. ANF.	LA
6	140 in 1990	1990, 1991	Largo Vista, along 204th St. (CR N4) just N of Big Pines Hwy, N slope of San Gabriel Mtns. ANF	LA
7	U	U	Mapped along N slope of San Gabriel Mtns. in vicinity of Valyermo. Land ownership: U	LA

8	U	1983	ca. 1.3 air mi. SSE of Colton Well, Clipper Valley, Mojave Desert. Along Essex Rd., ca. 0.6 mi. NW of junction with Black Canyon Rd. BLM.	SBD
9	U	1920	Vicinity of Bonanza King Mine, E slope of Providence Mtns. BLM-Needles RA.	SBD
10	U	1985	Ridge btw. Oro Fino Cyn. & Quigley Cyn., ENE of Newhall. Major disturbances from oil wells and assoc. activities. PVT.	LA
11	U	1985	S side of Quigley Cyn., on N-facing slope, E of Newhall. Major disturbances from oil wells and assoc. activities. PVT.	LA
12	1 in 1986	1986	ca. 3 mi. N of Cajon, Baldy Mesa, NE end of the San Gabriel Mtns. Land undisturbed but proposed for development. PVT.	SBD
13	1 in 1991	1991	Antelope Valley, ca. 0.3 mi. SE of Hesperia Airport, S of Hesperia. ORV trails throughout area. Land ownership: U	SBD
14	2	1991	Antelope Valley, ca. 0.6 mi. S of Hesperia Airport, 0.3 mi. E of California Aqueduct, S of Hesperia. Mapped along pipeline route just E of dirt road. Land ownership: U	SBD

15	8	1987	Grass Valley Creek, from Hwy. 173 S ca. 1 mi., E of Silverwood Lake. SBNF/Priv	SBD
16	80 in 1990	1990, 1991	N side of Hwy 138 in Cajon Cyn, ca. 1.5 mi. W of Cajon, San Gabriel Mtns. PVT, SBNF	SBD
17	40	1990, 1991	Lone Pine Cyn at Sharpless Ranch, San Gabriel Mtns. Bulldozer activity. SBNF.	SBD
18	15 in 1990	1990, 1991	Lone Pine Cyn btw. Sharpless Ranch and Clyde Ranch, San Gabriel Mtns. SBNF.	SBD
19	4	1992	Mouth of Heath Cyn., above Wrightwood, San Gabriel Mtns. PVT Development.	SBD
20	1	1989	Near Oro Grande Wash, along Hwy 395 ca. 0.5 mi. N of junction with I-15, W of Hesperia. Caltrans rest stop planned for site.	SBD
21	125 in 1991	1990, 1991	Horse Cyn, N side of Hwy. 2 ca. 1.3 mi. W of Hwy 138, San Gabriel Mtns. SBNF.	SBD
22	2	1991	Double G Ranch, near Mouth of Jesus Cyn., N slope of San Gabriel Mtns. PVT horse ranch.	LA

23	200 in 1991	1990, 1991	Big John Flat and Upper Boulder Cyn, N slope of San Gabriel Mtns. Cattle grazing, ORVs, target shooting, Foot traffic. SBNF.	LA
24	U	1990	E slope of Table Mtn., ca. 0.7 mi. S of oak Spring Ranch, N slope San Gabriel Mtns. SBNF.	SBD
25	U	ca. 1990	Trailhead at entrance to S. Fork Campground, S Fork Big Rock Creek, N slope San Gabriel Mtns. ANF.	LA
26	60 in 1990	1990, 1991	Pinyon Ridge, ca. 3-4 mi. SE of Valyermo, N slope of San Gabriel Mtns. Ridgeline disturbed by previous logging, controlled burning, ORV use. ANF.	LA
27	5 in 1990	1990, 1991	S. Fork Big Rock Creek, along trail ca. 0.5 mi. NW of S. Fork Campground, N slope San Gabriel Mtns. ANF.	LA
28	4 in 1990	1990, 1991	Holcomb Cyn, along trail ca. 1 mi. upstream from Big Rock Creek Rd., N slope San Gabriel Mtns. LA County Parks and Rec.	LA
29	10 in 1990	1990, 1991	Little Rock Creek, ca. 0.25 mi. upstream from confluence with S. Fork Little Rock Creek, San Gabriel Mtns. ANF.	LA

30	50 in 1992	1992, 1995	Alimony Ridge, ca. 3.6 mi. N of Bare Mtn, San Gabriel Mtns. ORV use, weeds, and fire. ANF.	LA
31	10 in 1994	1994, 1995	NE of Little Rock Creek, ca. 2.1 mi. NNE of Bare Mtn, San Gabriel Mtns. ANF.	LA
32	< 10 in 1994	1994, 1995	SW of Little Rock Creek, ca. 1 mi. NNE of Bare Mtn, San Gabriel Mtns. ANF.	LA
33	< 12 in 1994	1994, 1995	E of Little Rock Wash, ca. 0.4 mi. ENE of Little Rock-Palmdale Dam, San Gabriel Mtns. ANF.	LA
34	2 in 1994	1994, 1995	N of Santiago Cyn., ca. 0.7 mi. WSW of Joshua Tree Campground along Little Rock Reservoir, San Gabriel Mtns. ANF.	LA
35	50 in 1994	1994, 1995	NW of Santiago Cyn., ca. 0.8 mi. SE of Mt. Emma, San Gabriel Mtns. ANF.	LA
36	17	1994, 1995	E of Little Rock Creek, ca. 0.4 mi. ESE of Basin Campground above Little Rock Reservoir, San Gabriel Mtns. ANF.	LA
37	8 in 1994	1994, 1995	E of Little Rock Creek, ca. 1.1 mi. SE of Basin Campground above Little Rock Reservoir. ANF.	LA

38	5	1995	Carr Canyon, ca. 1.1 mi. NE of Little Rock-Palmdale Dam. ANF.	LA
39	6	1995	Btw. Hunt Canyon and Little Rock Wash, ca. 1.2 mi. WNW of Little Rock-Palmdale Dam, San Gabriel Mtns. ANF	LA
40	3	1995	Ridge W of Little Rock Wash, ca. 0.8 mi. W of Little Rock-Palmdale Dam. ANF.	LA
41	16	1995	S of Carr Canyon, ca. 1.1 mi. ENE of Little Rock-Palmdale Dam, San Gabriel Mtns. ANF.	LA
42	8	1995	W side of Little Rock Reservoir, ca. 0.3 mi. NNW of Lakeside Campground. ANF.	LA
43	4	1995	W side of Little Rock Reservoir, ca. 0.25 mi. SW of Juniper Grove Campground. ANF.	LA
44	6	1995	S Branch of Kitter Canyon, ca. 1.2 mi. SSW of confluence of Kitter Canyon and Little Rock Creek, San Gabriel Mtns. ANF.	LA
45	20	1995	Above Kitter Canyon, ca. 1.4 mi. SW of confluence of Kitter Canyon and Little Rock Creek, San Gabriel Mtns. ANF.	LA

46	3	1995	N slope of W Fork Bare Mtn. Canyon, ca. 0.25 mi. W of confluence with Bare Mtn. Canyon, San Gabriel Mtns. ANF.	LA
47	1	1995	Upper Bare Mtn. Canyon, about 2.5 mi. S of confluence with W Fork Bare Mountain Canyon, San Gabriel Mtns. ANF.	LA
48	7	1990	Powerline Rd. S of Mt. Emma Rd., ca. 1 mi. WNW of Little Rock Station along Little Rock Wash, San Gabriel Mtns. ANF.	LA
49	'few widely scattered plants in 1989'	1989, 1991	Hunt Canyon, along S side of Mt. Emma Rd., San Gabriel Mtns. ANF.	LA
50	40 (btw. occs. #50, 51 in 1990)	1990	N side of Mt. Emma Rd. ca. 1.9 mi. NE of junction with Angeles Forest Hwy. ANF.	LA
51	40 (btw. occs. #50, 51 in 1990)	1990	S side of Mt. Emma Rd. ca. 0.3 mi. NE of junction with Angeles Forest Hwy. ANF.	LA
52	12	1990	E of Mill Creek, ca. 0.4 mi. ENE of confluence of Mill Creek and Tie Canyon, San Gabriel Mtns. ANF.	LA
53	40	1990	Btw. Mill Creek and Angeles Forest Hwy. ca. 1 mi. SW of Tie Summit Station, San Gabriel Mtns. ANF.	LA

54	23	1989	SE of Pearblossom Hwy ca. 0.5 mi. S of the California Aqueduct at Barrel Springs Rd. PVT. Subdivision proposed.	LA
55	8	1989	San Andreas Rift Zone, just south of Elizabeth Lake-Pine Canyon Rd. and W of California Aqueduct W of Palmdale. PVT. Proposed development.	LA
56	305	1989	San Andreas Rift Zone, N of City Ranch Rd. and E of California Aqueduct, W of Palmdale. PVT. Proposed development.	LA
57	5	1989	Anaverde Valley btw. Anaverde Creek and the California Aqueduct, W of Palmdale. PVT. Proposed development.	LA
58	12	1989	Under power lines S of Anaverder Creek and W of the California Aqueduct, W of Palmdale. PVT. Proposed development.	LA
* (RSA)	10	2004	N. side of San Bernardino Mts. Along Hwy. 138 near Horsethief Cyn., T3N/R5W/S25, elev. 3200 ft. (Fraga/RSA)	SBD

- U = Unknown
- * = an occurrence number has not been assigned
- SBNF = San Bernardino National Forest

- ANF = Angeles National Forest
- SBD = San Bernardino County
- LA = Los Angeles County

Threats

In general, impacts to *Opuntia basilaris* var. *brachyclada* habitat in Los Angeles County have probably not been as great as in San Bernardino County. The Los Angeles County Planning Department has designated several Significant Ecological Areas (S.E.A.) within the range of this species, including Littlerock, Big Rock Creek, and Mescal Canyon, close to the San Bernardino County line, although a water pipeline has been proposed in the Mescal Canyon area.

Where *Opuntia basilaris* var. *brachyclada* occurs on the ANF, large areas of land have been designated open to off-road vehicle travel. This includes the upper reaches of Mescal Canyon where populations of *Opuntia basilaris* var. *brachyclada* have been reported. Scattered off-road vehicle tracks were found in this area during a habitat integrity survey (MacKay and Thomas 1997), but many places were too steep and the vegetation too dense and impenetrable to allow intense OHV travel.

Much of the *Opuntia basilaris* var. *brachyclada* range in San Bernardino County is on private land, and these plants are threatened with mechanical destruction/removal by off-highway vehicles and by residential construction. Future activity at a presently inactive limestone mine could potentially threaten a population northeast of Wrightwood.

Opuntia basilaris var. *brachyclada* not only has unusual stems, but its small compact form and beautiful flowers may make it desirable for cactus collectors. It is not known if horticultural collection has impacted occurrences, but there is the potential for future impacts from this activity.

Conservation and Management Considerations

In 1991, an action plan was developed to eliminate threats to *Opuntia basilaris* var. *brachyclada* within the Tujunga and Valyermo districts of the Angeles National Forest. This plan was to be implemented and overseen by the Angeles National Forest and Rancho Santa Ana Botanic Garden (Mistretta and Parra-Szijj 1991). This plan should continue to be implemented.

To prevent extirpation of *Opuntia basilaris* var. *brachyclada*, it is first necessary to determine where it is found and to assess population status. The primary conservation strategy is to better understand the status and distribution of this species on NFS land, and to manage the ANF portion under the 1991 Management Strategy were applicable.

The following is a list of conservation practices that should be considered for *Opuntia basilaris* var. *brachyclada*:

- Implement the 1991 ANF Management Strategy for this species.
- Survey all new occurrences of *Opuntia basilaris* var. *brachyclada* and any occurrences on NFS land that have not been visited in the past ten years and record occurrence status, habitat condition, and threats. Survey any occurrence that has burned to update occurrence status and assess resilience following fire.
- Survey all transmontane alluvial habitat on NFS land for this and associated rare plants, including *Canbya candida* and *Androsace elongata* ssp. *acuta*.
- Collect a herbarium voucher specimen of *Opuntia basilaris* var. *brachyclada* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Opuntia basilaris* var. *brachyclada* in the southern California National Forests using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Opuntia basilaris var. *brachyclada* is a fairly well-known rare species sparsely scattered across the desert-side foothills and base of the north slope of the San Gabriel and western San Bernardino Mountains. It is known from many localities across an area that are not well protected from identified threats. However, some of these occurrences are sufficiently inaccessible that they are not at risk of impacts associated with off-road vehicle travel. Effects of individual projects will be addressed at the project level, and as a FS Sensitive species, individual projects must not compromise this species' viability. Pervasive threats not within FS control, such as fire and invasive species (and the feedback dynamic between these two impacts) may pose a grave threat to this species across its range. While this species very nearly warrants a Threat Category 5 (substantial threats to persistence or destruction from Forest Service activities), no substantial differences in viability and distribution are expected across alternatives.

This species should be well monitored with close attention to changes in occurrence status, but based on the above analysis *Opuntia basilaris* var. *brachyclada* is currently assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Opuntia basilaris var. *brachyclada* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Opuntia basilaris* var.

brachyclada would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Opuntia basilaris* var. *brachyclada* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Nolina interrata

Oreonana vestita

Oreonana vestita

Oreonana vestita (S. Watson) Jepson (Woolly mountain-parsley)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Oreonana vestita is endemic to the San Bernardino and San Gabriel Mountains in California (Constance 1993).

Distribution in the Planning Area

At least four extant occurrences and one historical occurrence are documented on the San Bernardino National Forest, including two occurrences in the San Gorgonio Wilderness Area (USDA Forest Service 2003). Plants are known to occur on the Vivian Creek Trail and on San Gorgonio Mountain (Krantz, et. al. draft 2000). There are historic collections from Bear Valley, possible from Sugarloaf Ridge and/or Gold Mountain. Plants occur on the Angeles National Forest at San Antonio Summit, on Mount Lewis, and in the Mount Baldy area (USDA Forest Service 2003; CalFlora 2002).

Taxonomy and Natural History

Oreonana vestita is a dicotyledon in the carrot family (Apiaceae). This species is a perennial herb that blooms in June and July (Allen and others 1995).

Oreonana vestita is a 4-15 cm white-tomentose perennial. The leaves are characterized as 1.5-3 cm bladeless sheathes, the petiole is 2-10 cm, and the blade is 1.5-5 cm, ovate to round with 3-10 mm oblong segments (Constance 1993).

Habitat Description

Oreonana vestita is found on ridgetops and on rocky soils such as dry gravel or talus in lower and upper montane coniferous forest and subalpine coniferous forest at elevations of 6,500–11,500 feet (1,980–3,500 meters) (California Native Plant Society 2001, Allen and others 1995).

Occurrence Status

CalFlora (2003) lists several occurrences of this species. In addition, there are occurrences known from the San Gorgonio Wilderness and Bear Valley on the San Bernardino National Forest.

The following table shows the recorded occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Oreonana vestita* (Woolly mountain-parsley)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
1327606	U	1977	Mt. San Antonio Peak saddle between [old baldy and] Mt. Harwood. ANF/SBNF (on boundary).	SBD
1327605	U	1977	Mt. San Antonio Peak between Baldy Notch and Devil's Backbone. Same as 1327606? ANF/SBNF.	SBD
1323404	U	1971	San Gabriel Mountains. Land owner: U.	SBD
1358952	U	1886	Bear Valley. Land owner: U.	SBD
1407823, 1407821	U	1927	Old Baldy. ANF/SBNF.	LA/SBD

1188263	U	1958	Just S of Mt. Lewis. Just W of Dawson Saddle, along Angeles Crest Highway (SH 2), above headwaters of S. Fork of Big Rock Creek. San Gabriel Mtns. ANF.	LA
1179825	U	1918	San Gabriel Mtns. summit of North "Baldy". Land owner: U.	LA

- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

Threats

Because this is a talus-associated species, and most of the known habitat for this species is within wilderness, threats are few and generally limited to hiking off-trail. If the historic occurrences from Bear Valley were from talus/scree on Gold Mountain, the area was impacted for several decades by quartzite rock collection under permit from the SBNF. This activity is no longer permitted.

Conservation and Management Considerations

The primary strategy for the conservation of this species is to improve the knowledge of its distribution and to monitor and remedy impacts of trail use. The following is a list of conservation practices that should be considered for *Oreonana vestita*:

- Monitor trails where they transect occupied habitat and identify areas where off-trail foot traffic is impacting this species. Install protective measures where needed.
- Survey all new occurrences of *Oreonana vestita* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Oreonana vestita* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Oreonana vestita* in the southern California National Forests using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Oreonana vestita is narrowly distributed and locally common. While some of the recorded occurrences are vulnerable to identified threats, others are remote and not vulnerable to impacts.

Based on this analysis, *Oreonana vestita* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Oreonana vestita is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Oreonana vestita* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Oreonana vestita* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Oreonana vestita* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Opuntia basilaris var.
brachyclada**

Orobanche valida ssp. valida

Orobanche valida ssp. valida

Orobanche valida Jepson ssp. *valida* (Rock Creek broomrape)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3T1 S1.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Orobanche valida ssp. *valida* is known from at least one locality in the Topatopa Mountains of Ventura County and eight localities in the central and eastern San Gabriel Mountains (Stephenson and Calcarone 1999) of Los Angeles County. In 1996, an occurrence of *Orobanche valida* ssp. *valida* was discovered in Inyo County near the town of Independence (Nelson 1996).

Distribution in the Planning Area

Orobanche valida ssp. *valida* occurs on the Los Padres and Angeles National Forests (California Natural Diversity Database 2004). Plants occur in the San Gabriel Mountains at Lookout Mountain and along the South Fork of Big Rock Creek. In addition, surveys in 1994 and 1995 found six new localities in the eastern San Gabriel Mountains.

The lone occurrence of *Orobanche valida* ssp. *valida* found on the Los Padres National Forest consists of six, discrete colonies all located within ¼ to 1 mile from one another in the Hines Peak area of the Topatopa Mountains just north of the head of Santa Paula Canyon (Smith 1998).

Only a portion of the potential habitat for this taxon has been surveyed, and it seems likely that additional occurrences will be found in the western San Gabriel Mountains and at other locations in the Castaic and southern Los Padres regions (Stephenson and Calcarone 1999) and perhaps in the eastern Sierra Nevada foothills of Owens Valley.

Taxonomy and Natural History

Orobanche valida ssp. *valida* is a dicot in the broomrape family (Orobanchaceae). It is one of two subspecies of *O. valida* that occur in California (1993). *Orobanche valida* ssp. *valida* is restricted to southern California, while subspecies *howellii* occurs in northwestern California. *Orobanche valida* ssp. *valida* is easily distinguished from other broomrapes within its range by its two-tone corolla color and other inflorescence features (Armstrong 1983). However, the plants found in the Topatopa Mountains are intermediate in appearance between *Orobanche valida* ssp. *valida* in the San Gabriel Mountains and *Orobanche valida* ssp. *howellii* in northern California (Heckard and Collins 1982).

Orobanche valida ssp. *valida* is a perennial parasitic herb that blooms May through July (California Native Plant Society 2001) and sometimes into September. The stem is fleshy and mostly underground. Like other *Orobanche* species, *Orobanche valida* ssp. *valida* has little or no chlorophyll. It forms root-like structures that attach themselves to the roots of nearby host shrubs, from which it receives its food and water (Armstrong 1983). It parasitizes various chaparral species such as *Garrya* spp. (silk tassel), *Eriodictyon* spp. (yerba santa), *Eriogonum fasciculatum* (California buckwheat), *Achnatherum speciosum* (desert needlegrass), *Quercus john-tuckeri* (scrub oak), *Quercus wislizenii* (canyon live oak), and *Cercocarpus betuloides* (mountain mahogany); however, it is most frequent on silk tassel and, except in Inyo County, has never been observed without this shrub nearby. The Inyo County occurrence of *Orobanche valida* ssp. *valida* was found associated with *Purshia tridentata* var. *glandulosa* and *Eriogonum fasciculatum* var. *polifolium* (Nelson 1996).

Broomrape seeds are among the smallest in the plant kingdom. This small size facilitates their movement down through the soil to where they may germinate near the host plant roots (Armstrong 1983).

Habitat Description

Orobanche valida ssp. *valida* is found on coarse, well-drained soils in fairly open chaparral and pinyon-juniper woodlands at elevations of 4,100–6,600 feet (1,250–2,010 meters) (California Native Plant Society 2001). Substrates are often granitic in origin, but some occurrences are found on sedimentary rocks as well (Mistretta and Brown 1997). On the Angeles National Forest, *Orobanche valida* ssp. *valida* is found on both coastal and desert slopes (Mistretta and Brown 1997).

Associates include *Garrya veatchii*, *G. flavescens*, *Cercocarpus betuloides*, *Eriodictyon trichocalyx* var. *trichocalyx*, *Eriogonum fasciculatum* var. *polifolium*, *Yucca whipplei*, *Quercus chrysolepis*, *Q. john-tuckeri*, *Ceanothus leucodermis*, *Calystegia malacophylla*, and *Melica imperfecta*. Pinyon (*Pinus monophylla*) is sometimes nearby.

Occurrence Status

The distribution of *Orobanche valida* ssp. *valida* on National Forest System lands is poorly

known. Abundance data collected in the past two decades indicate that known occurrences are stable or increasing [estimated population size along the south fork of Big Rock Creek has increased from 50 plants in 1979 to 100 plants in 1982 and 300 plants in 1995 and the estimated population size at Lookout Mountain for the same three years was 35, more than 40, and 200 plants (Mistretta and Brown 1997)]. For the occurrence of *Orobanche valida* ssp. *valida* found near Hines Peak, the number of plants recorded was 100+ (Danielsen 1993). In all, the total number of plants estimated to occur is 1,600 with the majority (94 percent) occurring in the San Gabriel Mountains (Mistretta and Brown 1997).

Threats

Orobanche valida ssp. *valida* is considered to have low vulnerability on National Forest System lands. For the most part, it inhabits remote terrain that receives few impacts; however, management activities that affect the persistence or stability of the chaparral vegetation could adversely affect the taxon (Mistretta and Brown 1997). One occurrence near the Horse Canyon Shooting Area is vulnerable to habitat degradation. Another occurrence along the lower South Fork of Big Rock Creek is affected by erosion, and the population at Glendora Ridge (in the San Dimas Experimental Forest) could be adversely affected by desert crested wheatgrass, an introduced perennial grass (Stephenson and Calcarone 1999). The occurrence of *Orobanche valida* ssp. *valida* on the Los Padres National Forest is located close to FS road 5N08 and the Red Reef Trail (21W08). Plants here and elsewhere could be affected or obliterated by plant collectors or over-efficient trail and road maintenance crews.

Conservation and Management Considerations

The flowering stalks of *Orobanche valida* ssp. *valida* are inconspicuous and thus easily overlooked when growing under the canopy of its host shrub (Armstrong 1983). Trail and road maintenance crews should be alerted to the presence of *Orobanche valida* ssp. *valida* so that inadvertent impacts can be avoided. Any displacement of substrate in occupied habitat should be avoided if possible.

Consider permanent closure of the Horse Canyon shooting area to protect the population of *Orobanche valida* ssp. *valida* that is found there. Consider the erection of barriers along the trail in the vicinity of the *Orobanche valida* ssp. *valida* population found on the Lower South Fork to prevent trail cutting of switchback and subsequent slope erosion.

Evaluation of Current Situation and Threats on National Forest System Lands

Orobanche valida ssp. *valida* has a disjunct distribution, with one colony in the Topatopa Mountains of the Los Padres National Forest and six occurrences in the San Gabriel Mountains of the Angeles National Forest. All of these occurrences are in remote locations that do not appear to be affected by current or anticipated land uses.

Based upon the above analysis *Orobanche valida* ssp. *valida* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Orobanche valida ssp. *valida* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Orobanche valida* ssp. *valida* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Orobanche valida* ssp. *valida* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Oreonana vestita

**Oxytropis oreophila var.
oreophila**

Oxytropis oreophila var. oreophila

Oxytropis oreophila A. Gray var. *oreophila* (Mountain oxytrope)

Management Status

Federal: None

California: None

Heritage Rank: G4T4; S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 3-1-1

General Distribution

Oxytropis oreophila var. *oreophila* is known in California from the San Bernardino Mountains of San Bernardino County and the White and Inyo Mountains of Mono County (CalFlora 2002, Isley 1993). *Oxytropis oreophila* also occurs in Arizona, Nevada, New Mexico, and Utah (Isley 1993).

Distribution in the Planning Area

Oxytropis oreophila var. *oreophila* is known in southern California from only two locations in the San Gorgonio Wilderness area. This taxon has been collected on Mount San Gorgonio and less than eight miles away on the summit of Mount San Bernardino. These records are historical collections, dating from the late 1800s (CalFlora 2002). Krantz and others (2000) report the only recently-documented occurrence in the planning area, where it is restricted to the alpine zone at the summit of Mount San Gorgonio, above 11,000 ft (3,353 m).

Taxonomy and Natural History

Oxytropis oreophila var. *oreophila* is a dicotyledon in the pea family (Fabaceae). *O. oreophila* var. *oreophila* is recognized by the California Native Plant Society (2001), but Isley (1993) treats only the species *O. oreophila*. For the original description see *Proceedings of the American Academy of Arts and Sciences* 20:3 (1884); for taxonomic treatment see *Proceedings of the California Academy of Sciences* IV 27 (7): 212-215 (1952).

Oxytropis oreophila var. *oreophila* is a perennial herb that blooms June–September (California Native

Plant Society 2001).

Oxytropis oreophila is a silvery or gray, silky, caespitose plant. The leaves are basal and congested with 7-17 leaflets that are 2-10 mm, elliptic to oblong, and folded. The inflorescence is head-like, included or exerted. There are 2-12 flowers that are ascending or erect. The corolla is 7-10 mm, pink-purple, or sometimes white. The fruits are ascending or erect, 9-15 mm, 7-9 mm wide, ovoid-inflated, thinly papery, and slightly 2-chambered. There is no stalk-like base (Isley 1993).

Habitat Description

Oxytropis oreophila var. *oreophila* occurs at elevations of 11,155–12,467 ft (3,400–3,800 m) in gravelly or rocky areas of alpine boulder and rock fields and subalpine coniferous forest (Munz 1974; California Native Plant Society 2001). On Mt. San Gorgonio, *Oxytropis oreophila* var. *oreophila* occurs in association with *Eriogonum kennedyi* var. *alpigenum* and other low growing alpine plants.

Occurrence Status

Both reported occurrences in the Plan area are in the San Gorgonio Wilderness of the San Bernardino National Forest. The occurrence at the summit of Mt. San Gorgonio has been recently documented. The occurrence from Mt. San Bernardino has not been documented in over a century and needs updated fieldwork.

The following table shows the recorded occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Oxytropis oreophila* var. *oreophila* (Mountain oxytrope)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
889209	U	1879	Mt. San Bernardino. 12,000 ft. SBNF-San Gorgonio Wilderness.	SBD
889211, 889210	U	1879, 1880, 2000	Top of Mt. Grayback (Mt. San Gorgonio); Mount Grayback, 9700'. SBNF-San Gorgonio Wilderness.	SBD

- *U* = Unknown
- * = an occurrence number has not been assigned

- *SBNF* = *San Bernardino National Forest*
- *SBD* = *San Bernardino County*

Threats

No particular threats to *Oxytropis oreophila* var. *oreophila* have been identified. This taxon appears to be naturally rare. Potential threats to this taxon include impacts from recreational activities, such as camping and hiking off of designated trails. At Mt. San Gorgonio, some *Oxytropis oreophila* var. *oreophila* plants occur in close proximity to the summit trail and campsite. Because alpine plants are slow-growing, recovery from impacts may take much longer than it would in other habitats.

Conservation and Management Considerations

The primary strategy for the conservation of this species is to improve the knowledge of its distribution and to monitor and remedy impacts of trail use. The following is a list of conservation practices that should be considered for *Oxytropis oreophila* var. *oreophila*:

- Monitor trails where they transect occupied habitat and identify areas where off-trail foot traffic or camping is impacting this species. Install protective measures where needed.
- Survey all new occurrences of *Oxytropis oreophila* var. *oreophila* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Oxytropis oreophila* var. *oreophila* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Oxytropis oreophila* var. *oreophila* in the plan area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Oxytropis oreophila var. *oreophila* is extremely rare and narrowly distributed in the area. While some of the recorded occurrences are vulnerable to identified threats, these impacts are not expected to be frequent or severe. All of the suitable alpine habitat for this species within the province is rugged and not easily accessible by foot, most is in designated wilderness, and therefore this species habitat faces little threat.

Based on this analysis, *Oxytropis oreophila* var. *oreophila* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Oxytropis oreophila* var. *oreophila* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Oxytropis oreophila* var. *oreophila* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Orobanche valida ssp. valida

Packera bernardina

Packera bernardina

Packera bernardina E. Greene (San Bernardino ragwort)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Packera bernardina is endemic to Big Bear and Holcomb valleys in the San Bernardino Mountains. This species is known from approximately 16 occurrences in upper Holcomb Valley, Arrastre Flat, Aspen Glen, and Erwin Lake (California Natural Diversity Database 2004). A significant occurrence near Caribou Creek contained an estimated 1,000–1,500 plants in 1989 (USDA Forest Service 2002). Some of the occurrences occur on private land; others are held by The Nature Conservancy. Several occurrences on National Forest System lands have to be documented and are not yet in the database.

Distribution in the Planning Area

All occurrences of *Packera bernardina* are on or near the San Bernardino National Forest (California Natural Diversity Database 2004). Occurrences are known from the Big Bear Lake and Holcomb Valley Pebble Plain complexes.

Taxonomy and Natural History

Packera bernardina is a dicotyledon in the sunflower family (Asteraceae). It resembles *Packera ionophylla*, which also occurs in the San Bernardino Mountains, but it is distinguished by a combination of characters, including leaf shape, size and number of the flower heads, and presence of hairs on the stems and leaves (Barkley 1993). Barkley (1993) designated San Bernardino ragwort as *Senecio bernardinus*. Recent systematic studies have determined that San Bernardino ragwort belongs to a group of species that warrants recognition as a separate genus, *Packera*, and the scientific name for San

Bernardino ragwort has accordingly been changed from *Senecio bernardinus* to *Packera bernardina* (Barkley 1999, Baldwin et al. 2002).

Packera bernardina is a 1-5 dm perennial with a more or less creeping caudex. The lower leaf blades are 1-2.5 cm, (ob)ovate, toothed, and much smaller than the petioles. The inflorescence is characterized by 3-5(8) radiate heads. There are more or less 13 main phyllaries, but sometimes 21. The phyllaries are 6-8 mm, obtuse, and have green tips. There are 8(13) ray flowers with 8-10 mm ligules. There are fewer than 40 disk flowers. Fruit are glabrous or minutely rough-hairy, especially on the angle (Barkley 1993). *Packera bernardina* is a perennial herb that blooms May–July (California Native Plant Society 2001).

Habitat Description

Packera bernardina typically grows in meadows and seeps, but it can also be found in openings within sagebrush scrub, at the edges of pebble plains, and on dry, rocky slopes in the understory of Jeffrey pine woodlands. Approximately eight occurrences are found in dry, rocky, or open slopes in the understory of Jeffrey pine forest; the other occurrences are found in meadows in openings of Jeffrey pine forest (Barrows 1989). Common habitat parameters include alkaline, loosely compacted soils, open areas with low accumulations of organic material, elevations of 6,600–7,400 feet (2,000–2,250 meters), and shallow slopes under 30% (USDA Forest Service 2002; California Natural Diversity Database 2004). *Packera bernardina* has been found with *Castilleja cinerea*, *Pinus monophylla*, and *Juniperus occidentalis*. It sometimes occurs with several federally-listed species, including *Poa atropurpurea*, *Thelypodium stenopetalum*, and *Taraxacum californicum*.

Packera bernardina appears to tolerate slight disturbance; many of the occurrences are in areas that are mildly disturbed. The most disturbed site is the Snow Forest Ski Area. *Packera bernardina* has also been found in historical mining areas on overburden piles, and in and along seasonal drainages and mudflows. Some occurrences are in open sagebrush scrub and meadows that show no apparent signs of disturbance (Barrows 1989).

In areas where *Packera bernardina* occurs with federally-listed species, occurrences receive protection through conservation efforts directed at the listed species. Some meadows where *Packera bernardina* occurs are fenced.

Occurrence Status

Approximately ten *Packera bernardina* occurrences are reported on the San Bernardino National Forest. Occurrence size is variable; the largest occurrence has up to 1500 individuals. Individual plants tend to be distributed in small patches. One occurrence has been extirpated from the development of Bear Valley Golf Course.

The table shows the number of occurrences recorded in the literature, the number of plants reported to

be present, and the general location of these occurrences.

OCCURRENCE DATA – *Packera bernardina* (San Bernardino ragwort)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1984	SE edge of Erwin Lake, Bear Valley. Grazing confined to non-sensitive areas. In nearly pristine alkaline wet meadow w/ high densities of <i>Thelypodium stenopetalum</i> . Mostly undisturbed and fenced. No formal protection. PVT.	SBD
2	U	1939	Bear Valley Golf Course (Moonridge), San Bernardino Mtns. Now extirpated. PVT.	SBD
3	U	1962	Old Ski Beach at Kidd Cove; SW end of Big Bear Lake. PVT.	SBD
4	U	1982	Along Hwy 18 ca. 1 mi. E of Metcalf Bay. PVT.	SBD
5	300-500 (A) in 1989; 250 (B) in 1989	1989	At Snow Point (Snow Forest Ski Area) NW to Presbyterian Conference Grounds. Occurs on disturbed and undisturbed sites w/ in Jeffrey pine forest among <i>Abies concolor</i> , <i>Quercus kelloggii</i> . w/ <i>Phlox dolichantha</i> , <i>Castilleja cinerea</i> , <i>Ivesia argyrocoma</i> . Incl. former occ. #20. SBNF. B. Aspen Glen Picnic Area, S of Big Bear Lake. Corner of Mill Creek Rd. and Tulip Lane. In open woods at W side of parking lot behind restroom and along Tulip Lane. Plants are	SBD

			scattered in small patches. Jeffrey pine forest w/ <i>Cercocarpus ledifolius</i> , <i>Phlox dolichantha</i> . On shallow slopes from N to NE- and NW-facing slopes, mostly on shallow slopes above road and S of scattered cabins. Trail passes through some of population. Area historically disturbed from vegetation clearing. SBNF.	
6	U	1982	ca. 0.5 mi. NW of Big Bear High School. Nearby population of <i>Poa atropurpurea</i> . PVT.	SBD
7	100 in 1989	1988, 1989	ca. 0.25 mi. NE of Meadow Park, S side of Big Bear Lake. Surrounded by Jeffrey pine forest. In meadow w/ <i>Agropyron</i> sp., <i>Artemisia tridentata</i> , <i>Poa atropurpurea</i> , <i>Pyrrocoma uniflora gossypina</i> , <i>Sidalcea pedata</i> , <i>Taraxacum californicum</i> , <i>Ivesia argyrocoma</i> , <i>Castilleja cinerea</i> , <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> . Incl. former occ. #21. PVT, TNC.	SBD
8	500 in 1989	1982, 1989	Big Bear City, ca. 0.5 mi. W of sewage disposal facility at Baldwin Lake. Vicinity of Pan Hot Springs. W/ <i>Thelypodium stenopetalum</i> in meadow w/ high densities of <i>Poa atropurpurea</i> , <i>Sidalcea pedata</i> on alkaline clay. Grazing = threat. Big Bear City Community Services District.	SBD

9	1000-1500 in 1989 (PVT)	1982, 1989	Lakeshore S side of Baldwin Lake. w/ <i>Thelypodium</i> . SBNF; S margin of Baldwin Lake in open area where Shay Creek crosses. Abundant in open sagebrush scrub in dry area immediately E of Shay Rd. PVT.	SBD
10	U	1982	S side of Hwy 18, just N of Rebel Ridge, Bear Valley. Vicinity of Castle Glen unit of Big Bear Valley preserve system. w/ 9 other sensitive plant spp. TNC, PVT.	SBD
11	83 in 1978 S of Hwy 38; 103 near Van Dusen Cyn Rd. in 1978; 159 in 1989 W of Division Dr.	1979-1989	S of Hwy 38 about just W of Division Dr. and S of Van Dusen Cyn Rd. in S part of Cyn. Alkaline soil w/ <i>Pinus jeffreyi</i> , <i>Artemisia ludoviciana</i> , <i>Aster occidentalis</i> , <i>Poa pratensis</i> , <i>Distichlis spicata</i> , <i>Potentilla anserina</i> . PVT.	SBD
13	510	1989	Arrastre Flat, San Bernardino Mtns. Rocky to sandy granitic soils at margin of <i>Pinus jeffreyi</i> forest w/ <i>Artemisia tridentata</i> , <i>Pinus monophylla</i> , <i>Cercocarpus ledifolius</i> , <i>Abies concolor</i> , <i>Phlox austromontana</i> , <i>Chrysothamnus viscidiflorus</i> . OHVs = threat. SBNF.	SBD

14	200-500 in 1989	1988, 1989	W part of Holcomb Valley, ca. 0.7 mi. WNW of Hitchcock Ranch. Limestone outcrop in <i>Pinus jeffreyi</i> series w/ <i>Juniperus occidentalis</i> , <i>Eriogonum microthecum corymbosoides</i> , <i>Arabis shockleyi</i> , <i>Caulanthus</i> sp., <i>Delphinium</i> sp. No evidence of disturbance, but portion of population threatened by nearby limestone mining. SBNF.	SBD
15	375 in 1989	1978, 1989	S of Hwy 38, ca. 0.3 mi. WSW of Big Bear Ranger Station, Big Bear Lake. w/in N Shore Rec Development. Overuse of area is impacting population. Dry meadow opening in Jeffrey pine forest. Alkaline soils w/ <i>Ranunculus californicus</i> , <i>Aster occidentalis</i> , <i>Gutierrezia sarothrae</i> , <i>Poa pratensis</i> , <i>Artemisia ludoviciana</i> . SBNF	SBD
17	53 (area adj. to Castle Glen) + 47 (in Castle Glen Preserve) in 1989	1984, 1989	Along Hwy 18, 1.8 mi. W of Big Bear City. Under <i>Pinus jeffreyi</i> on N-facing slope. Castle Glen Preserve and adjacent area. Open Jeffrey pine forest w/ <i>Cercocarpus ledifolius</i> , <i>Erysimum capitatum</i> , <i>Penstemon linearifolia</i> , <i>Arabis pulchra</i> . TNC, PVT.	SBD

19	900 in 1989	1988, 1989	Upper Holcomb Valley, from Holcomb Valley Campground E to Belleville S to Head of Van Dusen Cyn. Wet meadow/pebble plain communities w/ <i>Thelypodium stenopetalum</i> plus 13 other sensitive spp. Surrounded by Jeffrey pine forest. Mining claims in the area, some dispersed camping. SBNF.	SBD
*	200	2000	Meadow N of Alpine Pedal Path, just E of Juniper Pt. parking lot and S of Discovery Center. w/ <i>Muhlenbergia rigens</i> , <i>Horkelia</i> , <i>Aster</i> , <i>Artemisia tridentata</i> , <i>Rosa woodsii</i> , <i>Ranunculus californicus</i> , <i>Gutierrezia microcephala</i> . Bare soil, probably alkaline. No visible disturbance, but off-trail use may be potential threat. SBNF.	SBD
*	150	2000	S of Hwy 38, W of JCT of Hwy/Division, by two pump houses. Plants growing in mostly bare soil w/ <i>Potentilla</i> sp., <i>Horkelia</i> sp., <i>Taraxacum officinale</i> , <i>Artemisia ludoviciana</i> . Alkaline, dry, mostly bare soil. No visible disturbance. Potential threat = trampling. SBNF.	SBD
*	*	2000	Hornet mining claim, north side of Belleville Meadow. Plants occur within and upslope from meadow in wet and dry habitats. High potential for plants to be affected by gold mining activities which include digging, parking, camping. SBNF	SBD

*	*	1998	Various locations along proposed trials motorcycle cross country event course north of Forest Road 3N07 in Holcomb Valley. Event discontinued in 1998 after event analysis showed effects to habitat could not be avoided for this and other rare species. SBNF	SBD
*	40	2004	Snow Summit Ski Resort, SBNF. In tree islands in between ski runs. 2 point locations. (VinZant, USFS)	SBD
*	U	2004	Bear Mountain Ski Resort to Sugarloaf Peak, SBNF. Scattered across north facing slopes. Many point locations. (VinZant, USFS)	SBD
*	U	2004	Sugarloaf Peak to Wildhorse Meadow, SBNF. Scattered across north facing slopes. Many point locations. (VinZant, USFS)	SBD
94705 (RSA)	U	1922	San Gabriel Mts., Big Pines region W of Swartout Valley (Peirson/RSA)	LA
370062 (RSA)	U	1975	San Bernardino Mts., Big Bear Lake Village near jct. Of Mill Creek Rd. and Tulip Lane, elev. 6950 ft. (Thorne/RSA)	SBD
252761 (RSA)	U	1972	San Bernardino Mts., Snowslide Rd., 1.8 miles E. of Green Valley campground, elev. 7000 ft. (Wilken/RSA)	SBD

155783 (RSA)	U	1962	San Bernardino Mts., at NW end of Big Bear Lake along Hwy 18, 0.4 mi. from jct. With Hwy 30 (Raven/RSA)	SBD
224888 (RSA)	U	1936	San Bernardino Mts., NE corner of Bear Lake, elev. 6500 ft. (Munz/RSA)	SBD
337862 (RSA)	U	1979	San Bernardino Mts., Holcomb Valley, Sagebrush Flat along Holcomb Creek below Hitchcock Ranch, where 3N12 crosses the creek, elev. 7150 ft. (Thorne/RSA)	SBD
49873 (RSA)	U	1924	San Bernardino Mts., 3mi. E of Fawnskin (Johnston/RSA)	SBD
49874 (RSA)	U	1924	San Bernardino Mts., 2mi. W of Fawnskin (Johnston/RSA)	SBD
302518 (RSA)	U	1979	San Bernardino Mts., along Caribou Creek in Van Dusen Cyn. 1.6 mi. N of jct. With Hwy 38 in Big Bear City, elev. 7100-7300 ft. (Thorne/RSA)	SBD
20201 (UCR)	U	1979	Holcomb Valley, just S. of jct. 3N16 and 3N12/ T3N/R1W/S36-31 (Krantz/UCR)	SBD
20200 (UCR)	U	1979	Holcomb Valley, just W. of jct. 3N16 and 3N12, limestone outcrop/ T3N/R1W/S36 (Krantz/UCR)	SBD

24624 (UCR)	U	1979	Bear Valley N of Oriole and Swan Dr., ca.100 m. from the lake shore, T2N/R1E/S16 (Krantz/UCR)	SBD
93685 (UCR)	U	1996	Holcomb Valley, N side of the road near site of Belleville, upper Caribou Creek / T3N/R1E/S28/SW ¼	SBD
82700 (UCR)	U	1994	San Bernardino Nat'l Forest, Holcomb Creek headwaters / T3N/R1W/ S25 (White/UCR)	SBD
114599 (UCR)	U	1997	W side of Baldwin Lake, Big Bear City, SE of Pan Hot Springs, T2N/R1E/S12 SW ¼ (Sanders/UCR)	SBD
141439 (UCR)	U	1975	NW Holcomb Valley, just N of Holcomb Creek crossing 3N12, 5.9 mi. from fawnskin Latting/UCR)	SBD

- *U = Unknown*
- **= an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Packera bernardina is affected by recreational activities (dispersed camping, hiking, and equestrian use), prospecting, and road use and maintenance. Any activity that alters hydrology can affect habitat. Unauthorized off road driving also affects occurrences. Activities that occur on several gold mining claims in Holcomb Valley affect this plant and its habitat. A large portion of occupied habitat for *Packera bernardina* on the San Bernardino National Forest has benefited from conservation measures implemented from 1999-2002 to protect pebble plain and meadow habitat in Big Bear and Holcomb Valley. Special use events that have affected this species in the past have also been discontinued. On private land, this species is threatened by grazing, recreational use, and residential and commercial development.

Conservation and Management Considerations

The following list of conservation practices should be considered for *Packera bernardina*:

- To acquire better information on the locations and numbers of plants present, and to ensure protection of all locations of this species, better documentation is needed each time this species is observed in the field. Botanists should be instructed to document occurrences whenever plants are encountered and also to ensure that occurrences identified as this species are not in fact *Packera ionophylla*.
- Implement strategies within the Pebble Plain and Meadow Habitat Management Guides to the greatest extent practicable.
- Survey all new occurrences of *Packera bernardina* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Packera bernardina* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Packera bernardina* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Packera bernardina is endemic to Big Bear and Holcomb valleys in the San Bernardino Mountains. Habitat is affected by developed and dispersed recreational activities, gold mining, prospecting, road use and maintenance and unauthorized uses.

Based on the above analysis, *Packera bernardina* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	C	B	C	A

Packera bernardina is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the

development of a biological evaluation at the site-specific level.

The viability of this species is tied tightly to protection and management of meadow and pebble plain habitat. Existing protections of these habitats for the benefit of the associated listed threatened and endangered plant species provide considerable baseline protection. With full implementation of the Meadow and Pebble Plain Habitat Management Guides, viability for this species on NFS lands is increased; however protection of upland habitat within conifer forest is necessary for protection across the range of the species.

Consideration of the Suitable Use restricting vehicle travel to designated Forest Transportation System roads and trails, along with Standards for species protection, recreation, riparian management, ground water extraction and mining factor into the outcomes. The recommended candidate Arrastre RNA is important to the outcomes. Presumed implementation of the Pebble Plain and Meadow Habitat Management Guides is key to these outcomes under all alternatives. To provide for viability of this species, some of the most important habitat for this species must be clearly and substantially protected. Under all alternatives, a large portion of occupied habitat would continue to be managed within the existing North Baldwin Lake/Holcomb Valley Special Interest Area. Under Alternatives 2-6, habitat protection within the North Baldwin Lake/Holcomb Valley Special Interest Area would be increased due to Standard 33, that places a higher level of resource protection within SIA's.

Under Alternative 1, pebble plain habitat in general, and *Packera bernardina* in particular, would continue to be at risk from unauthorized vehicle travel off Forest Transportation System roads and trails. Under this alternative however, *Packera bernardina* would continue to benefit from listed species management where it co-occurs with federally listed species. Under Alternatives 2, and 4a, the establishment of the candidate Arrastre Research Natural Area, would provide protection to occupied habitat that contains a large number of individual plants. Under Alternative 3, the Union Critical Biological zone, and the candidate Arrastre Research Natural Area, would provide substantial protection for this species. Under Alternative 4, the important protections associated with the candidate Arrastre Research Natural Area designation and the Union Critical Biological zone would not occur. This combined with the Alternative 4 focus on sustaining the recreation resource by maintaining or expanding facilities at a moderate rate with less emphasis on sustainable dispersed recreation would increase effects to habitat from dispersed recreation. There would be less effects than under Alternative 5 due to zoning and the alternative emphasis however management under Alternative 4 may not allow populations to remain stable. Under Alternative 4a, the recommended candidate Arrastre Research Natural Area would add protection for a large number of individual plants. Additional protection from dispersed recreation would be afforded by the replacement of a portion of Back Country zoning with Back Country Motorized Use Restricted zoning in Holcomb under Alternative 4a. The emphasis on management of dispersed recreation in this alternative would also benefit this taxon. Under Alternative 5, land use zoning would result in decreased protection as areas currently zoned as Back Country Non-Motorized would become Back Country. No Special Area designations would occur that would promote habitat protection for this species under Alternative 5; increases in motorized use, and road construction and maintenance would increase impacts to habitat. The potential for increased water withdrawal could also affect wetland habitat for this taxon under this alternative. Under Alternative 6,

Back Country Non-Motorized zoning across the range of the species, along with the recommendation to establish the candidate Arrastre Research Natural Area and the Union Critical Biological zoning would provide substantial protection.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	B	C	C	D	B

Occupied habitat has been extirpated in the past on private lands in the Big Bear Valley and continues to be affected by multiple activities. Although several occurrences on private land are protected, much of the habitat within the Erwin Lake and Big Bear Lake areas are rapidly being affected by new housing developments. By maintaining the current distribution of *Packera bernardina* on National Forest System lands under Alternatives 1, 2, 3, 4, 4a and 6, only Alternative 5 would be expected to contribute substantial adverse cumulative effects that would cause *Packera bernardina* to suffer a decline in its overall distribution. Under Alternative 5, this would occur due to lack of habitat protection as no new Special Areas would be designated, and potential effects from increased motorized use as lands that are currently zoned as non-motorized would become motorized. In addition, the potential for an increase in water withdrawal on NFS lands and the emphasis of this alternative were considered. These factors combined with effects described above on private lands result in a D rating for Alternative 5 on All Lands.

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**Oxytropis oreophila var.
oreophila**

Packera ganderi

Packera ganderi

Packera ganderi (T.M. Barkley & R.M. Beauchamp) W.A. Weber & Á. Löve (Gander's ragwort)

Management Status

Federal: Forest Service Sensitive

California: Rare

Heritage Rank: G2, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B R-E-D Code 3-2-3

General Distribution

Packera ganderi, Gander's Ragwort, is endemic to the Laguna and Palomar Mountains in southwest San Diego County. About 35 occurrences are known on both public and private lands (USDA Forest Service 2005).

Distribution in the Province

Twenty-seven occurrences are documented on the Cleveland National Forest (California Department of Fish and Game 2002). The species occurs on 67 acres (27 hectares) of land on the Cleveland National Forest, including Black Mountain, El Cajon Mountain, Lawson Peak, and Barber Mountain (Stephenson and Calcarone 1999; California Department of Fish and Game 2002).

Taxonomy and Natural History

Packera ganderi is a perennial herb in the sunflower family (Asteraceae) that flowers in April and May (California Native Plant Society 2001). It is treated as *Senecio ganderi* in *The Jepson Manual* (Barkley 1993). *Senecio* (ragwort) is a large genus that has been the subject of recent taxonomic revision. Barkley (1999) recently segregated approximately half of the *Senecio* species in California into the genus *Packera*. *Packera ganderi* is the revised name for Gander's ragwort. For more information see Jepson Flora Project (2005).

Packera ganderi is more or less glabrous, purple-tinged below. Singular stems originate from a slender rootstock, and are erect to weakly ascending, with a basal rosette of leaves. Leaves are thickish, and the

blades of basal leaves are 4 – 8 cm long, less than the petiole. Leaves are more or less round-cordate, often with 2 – 6 lobes, toothed or shallowly lobed. The stem leaves are few, deeply and sharply toothed, and are smaller than the basal leaves. The inflorescence consists of 4 to 8 radiate heads. There are around 21 main phyllaries, sometimes only 13. The phyllaries are 8 – 11 mm with green tips. Outer phyllaries are missing or few. Flower heads have 13 or more ray flowers, with 10 – 15 mm long ligules that are yellow-orange to orange. There are less than 40 disk flowers per head. Fruits are glabrous (Barkley 1993). Seed production appears to be influenced by annual variation in rainfall. *Packera ganderi* does not produce much viable seed in drought years (Burrascano pers. comm.).

Habitat Description and Status

On National Forest System lands, *Packera ganderi* is found on gabbro soils (Stephenson and Calcarone 1999). It grows in chaparral at elevations of 1,300-3,900 feet (400-1,200 meters). It is usually found on recently burned sites and gabbro outcrops (California Native Plant Society 2001, California Department of Fish and Game 2004).

Occurrence Status

OCCURRENCE DATA of *Packera ganderi* (Gander's ragwort) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
*	2-1	U	1979	Lawson Peak / CNF	SD
*	2-2	U	1979	Lawson Peak / CNF	SD
*	2-3	U	U	El Cajon Mountain / CNF	SD
9	2-4	U	1979	Black Mountain / CNF	SD
*	2-5	U	U	Black Mountain / CNF	SD
8	2-6	U	U	Mesa Grande Quad. / CNF	SD

*	2-7	U	U	Mesa Grande Quad. / CNF	SD
6	2-8	U	U	Mesa Grande Quad. / CNF	SD
6	2-9	U	U	Mesa Grande Quad. / CNF	SD
6	2-10	U	U	Mesa Grande Quad. / CNF	SD
6	2-11	U	U	Mesa Grande Quad. / CNF	SD
6	2-12	U	U	Mesa Grande Quad. / CNF	SD
3	2-13	U	U	Mesa Grande Quad. / CNF	SD
6	2-14	U	U	Mesa Grande Quad. / CNF	SD
11	2-15	100-1000	1986	Barber Mountain / CNF	SD
11	2-16	100-1000	1986	Barber Mountain / CNF	SD
*	2-17	300-500	1988	El Cajon Mountain / CNF	SD
4	2-18	1	1993	El Cajon Mountain / CNF	SD
*	2-19	20	2001	Lawson Peak / CNF	SD

*	2-20	1	2001	Lawson Peak / CNF	SD
*	2-21	1000 +	2001	Lawson Peak / CNF	SD
*	2-22	500 +	2001	Lawson Peak / CNF	SD
*	2-23	100	2001	Barber Mountain / CNF	SD
*	2-24	40	2001	Barber Mountain / CNF	SD
*	2-25	68	2001	Barber Mountain / CNF	SD
*	2-26	5 +	1997	Black Mountain / CNF	SD
*	2-27	100 +	2002	Black Mountain / CNF	SD

U = Unknown.

** = an occurrence number has not been assigned*

CNF = Cleveland National Forest

SD = San Diego County

Threats

Packera ganderi plants and habitat on Black Mountain are affected by hang-gliding activity and launch pad construction. Some occurrences of *Packera ganderi* on National Forest System lands are adjacent to roads and have been reported to be subject to disturbance by off-highway vehicle (OHV) use (California Department of Fish and Game 2004). Increased recreation on mountaintops and peaks where plants occur may negatively affect populations by trampling and collecting plants. Road maintenance activities may also affect occurrences, as well as reported unlawful shooting activities at Lawson Peak. However, off-road vehicles do not appear to be a concern or a threat to any of the occurrences; most populations on National Forest System lands appear to be well-protected at this time (Winter pers. comm.). Habitat loss from development appears to be a threat primarily on private lands (California Department of Fish and Game 2004).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Packera ganderi*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Monitor populations near Forest system roads, trails, and OHV routes.
- Monitor and deter unauthorized off-highway vehicle use at Barber Mountain.
- Monitor impacts of recreation use at Black Mountain.
- Monitor unlawful shooting at Lawson Peak to determine if habitat is affected.
- Allow wildland fires to freely burn through populations. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks and roads, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. The use of hand line for fuel break construction is preferred.
- Avoid developing recreation and/or administrative facilities on peaks where plants occur.

Evaluation of Current Situation and Threats on National Forest System Lands

Packera ganderi has moderate vulnerability on National Forest System lands. The occurrences on National Forest System lands are believed to be stable (Stephenson and Calcarone 1999) and are considered to be well protected at this time (Winter pers. comm.). However, many occurrences are at mountaintops, peaks, and roadsides where recreation activities have the potential to affect occurrences. On the Cleveland National Forest, *Packera ganderi* is found in twenty-seven locations on gabbro soil. It is subject to impacts from recreation activities (hang-gliding, general recreation) and unauthorized activities at three of those locations. In the future, there may be potential for occurrences along the wildland urban interface to be affected by fuels treatments. The species is said to be a fire follower, so it may benefit from mild disturbance. However, Cleveland NF records show decreases in the number of plants at several locations over the last 20 years. These declines could represent natural variation in response to rainfall, or may indicate a declining trend due to recreational activity. Consistent monitoring of populations in affected areas for several years will be necessary to determine whether this species is truly at risk from Forest Service activities or not.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	A

Packera ganderi is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Under Alternatives 1, 2, 4, and 5, Lawson Peak and Barber, Black and El Cajon mountains would be zoned Back Country and Developed Area Interface. Under Alternative 4a, these locations would be zoned a combination of Back Country, Back Country Motorized Use Restricted, and Back Country Non-Motorized. In Alternative 3, the locations above would be zoned Back Country, Back Country Non-Motorized, and Developed Area Interface. These locations under Alternative 6 would be zoned Back Country Non-Motorized and Developed Area Interface. There are no Wilderness Areas, RNAs or Critical Biological zones proposed in any of the alternatives that would benefit this species.

Due to the fact that many of the *Packera ganderi* occurrences occur immediately adjacent to or near roads, they are susceptible to unauthorized off-road driving. Alternatives such as 4a and 6 that restrict public access while allowing roads to remain in place may curtail some unauthorized use; however despite how locations are zoned, unauthorized use is still expected to occur. Occurrences within Developed Area Interface may be subject to future fuels treatments that could affect habitat. Alternatives 2-5 would concentrate fuels treatments within the defense and threat zones whereas a lesser amount of habitat may be affected in Alternative 6 as fuels treatments would more likely be proposed within defense zones only.

The alternative emphasis as described below was also considered in predicting these outcomes. Under Alternative 1, the current management of *Packera ganderi* habitat would be retained. Under alternative 2, there is a higher level of investment in avoidance and minimization of effects to species-at-risk but provides little focus on the restoration of habitats. More intensive user controls would be designed to minimize user conflicts with sensitive environmental resources. Under Alternative 3, there is a higher level of investment in proactive habitat improvement and surveys, and a stronger focus on habitat restoration compared to avoidance of habitat degradation. There is a higher level of investment in maximum visitor capacity controls and modification of existing facilities including a decommissioning of recreation facilities and individual sites that are affecting sensitive resources. This alternative would proactively reduce recreational effects from such uses as hang gliding. Under Alternative 4, this alternative would provide the most emphasis on all types of recreation. In this alternative, there is a higher level of focus on management of recreation growth including monitoring recreation use and its effects and managing use in order to offset effects of uses on other resources such as wildlife and vegetation, emphasizing enforcement, and public education programs. Under Alternative 4a, recreation effects to *Senecio ganderi* would be expected to be less than under Alternative 4 as the recreation emphasis in Alternative 4a would be to sustain the setting through management of dispersed recreation

and to maintain or expand existing facilities prior to constructing new ones at a low rate. In addition, use of the Back Country Non-Motorized Use Restricted and some Back Country Non-Motorized zoning in this alternative within occupied habitat may provide a higher degree of protection than in Alternative 4. Alternative 5 is designed to fully accommodate the projected demand for motorized recreation use. This in turn may increase incidents of unauthorized off-route vehicle travel in occupied habitat increasing the risk that portions of the population could be damaged. In Alternative 6, there is a higher level of emphasis on low impact recreation, visitor capacity controls, public education and habitat restoration. *Packera ganderi* occurrences in these areas would have less potential for damage and destruction in the absence of motorized access; damaged habitat would be restored.

Viability Outcomes for all Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Packera ganderi has moderate vulnerability across its range. This species is distributed in several highly restricted occurrences and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). *Packera ganderi* is included in a conservation strategy for coastal sage scrub (USDA Forest Service and others 1997). Due to the fact that 27 of the 35 occurrences are on NFS lands, and occurrences on private lands could be subject to development, management of NFS lands does affect the overall outcome.

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Packera bernardina

Packera ionophylla

Packera ionophylla

Packera ionophylla (Greene) W. A. Weber & A. Löve (Tehachapi ragwort)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Packera ionophylla is endemic to the southern Sierra Nevada, Tehachapi, San Gabriel, and San Bernardino Mountains in Kern, San Bernardino, and Los Angeles Counties (California Native Plant Society 2001, Barkley 1993).

Distribution in the Planning Area

Packera ionophylla occurs on the Angeles and San Bernardino National Forests. It has been collected from the Kratka Ridge area and is known from Horse Flats Campground on the Angeles National Forest (CalFlora 2002). In the San Bernardino National Forest, it is known in the Big Bear area along Sugarloaf Ridge (on rocky soils), along Holcomb Creek, Heart Bar, South Fork of the Santa Ana River, and along Forest Road 2N83 south of Wildhorse Meadow (USDA Forest Service 2003).

Taxonomy and Natural History

Packera ionophylla is a dicotyledon in the sunflower family (Asteraceae). This perennial herb blooms from June-July (California Native Plant Society 2001). Occurrences of *Packera ionophylla* in the San Bernardino Mountains can be easily confused with San Bernardino ragwort (*Packera bernardina*).

Packera bernardina is densely woolly and has short (1–2 cm), unlobed leaves, whereas *Packera ionophylla* has sparse woolly hairs and has longer leaves (2–5 cm) with lobed blades (Munz 1974).

The Jepson Manual classifies Tehachapi ragwort as *Senecio ionophyllus* (Barkley 1993); however, recent systematic studies have determined that Tehachapi ragwort belongs to a group of species that

warrant recognition as a separate genus, *Packera*, and that the scientific name for Tehachapi ragwort is *P. ionophylla* (Baldwin and others 2002).

Packera ionophylla is a 1-5 dm perennial from a taprooted or rhizomed caudex. The leaves are thick. The lower blades are 1-2.5 cm, less than the petiole, ovate to round, and often 2-6-lobed. The upper leaves are more deeply lobed. There are 1-6 radiate heads in the inflorescence. There are about 21 main phyllaries, but sometimes 8 or 13. The phyllaries are 6-10 mm and have green tips. There are 0, 8, or 13 ray flowers with 8-10 mm ligules. There are fewer than 40 disk flowers. Fruit are glabrous (Barkley 1993).

Habitat Description

Packera ionophylla occurs in lower and upper coniferous forests at elevations of 4,875–8,775 feet (1,500–2,700 meters) on dry, rocky, granitic soils and within crevices (California Native Plant Society 2001, Barkley 1993). On the Angeles National Forest, this species inhabits dry, rocky slopes within yellow pine forest. On the San Bernardino National Forest, *Packera ionophylla* occasionally grows on carbonate substrates in addition to granitics; for example, on Sugarloaf Ridge (Krantz, et. al. draft 2000). In this habitat, *Packera ionophylla* has been found in association with *Physaria kingii* ssp. *bernardina*, *Eriogonum microthecum* var. *corymbosoides*, and *Abronia nana* ssp. *covillei*.

Occurrence Status

Population status and trends for *Packera ionophylla* on National Forest System lands are unknown (USDA Forest Service 2003).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Packera ionophylla* (Tehachapi ragwort)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
*	~10	2002	Upper Green Canyon, alongside Trail 2E18 to Sugarloaf Mountain, below Green Spring. SBNF.	SBD

*	< 10	1998	ca. 1-1.3 mi. E of Sugarlump. Steep slope grading to upper ridge shoulder. Open rocky slope w/ <i>Lesquerella kingii</i> ssp. <i>bernardina</i> , <i>Abronia nana</i> ssp. <i>covillei</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . SBNF.	SBD
*	< 5 (limited to an area)	1998	Immediately W of Sugarlump summit. Very steep slope, drainage chute bounded by cliffy outcrop. Open area at edge of woodland w/ <i>Lesquerella kingii</i> ssp. <i>bernardina</i> , <i>Eriogonum microthecum</i> var. <i>corymbosoides</i> . SBNF.	SBD
1244669 (CalFlora)	U	1958	ca. 1.0 mi. W of Cedar Spring. N face of ridge, upper slope of canyon. Kratka Ridge. Little Rock Creek. San Gabriel Mountains. ANF.	LA
*	3	2001	Holcomb Cr. Drainage, near Pacific Crest Trail. Access by Forest Road 3N16. Steep granitic slope with scattered boulders on N facing slope, 50 ft above Holcomb Creek. Mostly barren slope composed of coarse sand w/in canyon oak scrub recovering from 1999 Willow Fire. With <i>Poa</i> sp., <i>Bromus tectorum</i> , <i>Erysimum capitatum</i> SBNF	SBD

*	2	2001	OHV trail 1W17, 100 m S of Pacific Crest Trail, open 45 degree N facing slope, rocky, mostly barren, granitic colluvium w/in open yellow pine/canyon oak forests with <i>Poa</i> sp., <i>Arabis repanda</i> , <i>Bromus tectorum</i> , in 1999 Willow Fire area. SBNF	SBD
*	7	2001	Junction of OHV Trail 1W17 and Pacific Crest Trail, 100 feet east of Junction on PCT, N side of trail. Open 30 degree N facing slope. Rocky and sandy granitic substrate w/ <i>Eriogonum saxatile</i> , <i>Ivesia santolinoides</i> , <i>Poa</i> sp., <i>Erigeron foliosus</i> , <i>Chaenactis santolinoides</i> . In 1999 willow Fire area. SBNF	SBD
*	U	2004	Along Sugarloaf Ridge from unknown peak elev. 8490 ft. of Bear Mountain Ski Resort, E. to unknown peak elev. 9123 ft. USFS.	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

Threats

A potential threat to *Packera ionophylla* is the development of recreation sites, including ski area expansions. Other potential threats include dispersed recreation and road maintenance activities (USDA Forest Service 2003).

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Packera ionophylla*:

- Survey all new occurrences of *Packera ionophylla* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Packera ionophylla* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Packera ionophylla* in the planning area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Packera ionophylla is often found in disturbed sites such as along pipelines, road edges, along trails, near developed recreation sites, and in burned areas. This species appears to tolerate some level of disturbance. This species is fairly widespread but uncommon throughout its range.

Based on the above analysis, *Packera ionophylla* is currently assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Packera ionophylla is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Packera ionophylla* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Packera ionophylla* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Packera ionophylla* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Packera ganderi

Parnassia cirrata var. cirrata

Parnassia cirrata var. cirrata

Parnassia cirrata Piper var. *cirrata* (Fringed grass-of-Parnassus)

Management Status

Federal: None

California: None

Heritage Rank: G2; S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Parnassia cirrata var. *cirrata* is endemic to the San Gabriel and San Bernardino mountains of Los Angeles and San Bernardino counties in southern California. Recent collections from Shasta and Siskiyou Counties are attributed to *Parnassia cirrata* var. *intermedia* (also a Forest Service Sensitive species).

Distribution in the Planning Area

All known occurrences of *Parnassia cirrata* var. *cirrata* are on National Forest System lands with the exception of the Gilman Canyon occurrence for which actual land ownership is unknown. Four occurrences are located on the Angeles National Forest. These occurrences include Alder Gulch, Yucca Flats, and the North Fork of the San Gabriel River near Falling Springs. Four occurrences are located on the San Bernardino National Forest at Mill Creek Mine, Vivian Creek, Falls Creek and possibly Gilman Canyon. There is also a collection from Falls Creek at Dobb's Cabin (Krantz, et al. draft 2000).

Taxonomy and Natural History

Parnassia cirrata var. *cirrata* is a dicotyledon in the saxifrage family (Saxifragaceae). This species blooms between August-September (California Native Plant Society 2001). (The genus *Parnassia* is sometimes separated out into its own family (Parnassiaceae). The original description of *Parnassia cirrata* appears in *Erythea* 7(1):128 (1899) (California Native Plant Society 2001).

The change from *Parnassia cirrata* to *Parnassia cirrata* var. *cirrata* is documented on the Jepson

Interchange (Jepson Flora Project 2005).

Parnassia cirrata var. *cirrata* is a perennial herb that has 3-18 cm leaves. The leaf blades are 1-6 cm, round-ovate, and have a tapered base. The inflorescence is 17-43 cm. The bract above the middle of the peduncle is ovate, and the base is cordate and clasping. The calyx lobes are 3-7 mm, elliptic, more or less entire, and reflexed in fruit. The petals are 8-15 mm, ovate to more or less elliptic, and fringed below. The staminodes are 3-6 mm, have fewer than 15 lobes, are more or less equal, and have spheric tips. Fruit are 5-13 mm (Elvander 1993).

Habitat Description

Parnassia cirrata var. *cirrata* inhabits mesic areas in lower and upper montane coniferous forest between 2,135-3,000 m. On the Angeles National Forest, *Parnassia cirrata* var. *cirrata* appears to be associated with calcareous seeps. On the San Bernardino National Forest, this species occurs in moist washes, springy meadows, and streamsides within lodgepole pine forest and ponderosa pine forest. Associated plants species include *Gentianella amarella* ssp. *acuta* and *Muhlenbergia andina*.

Occurrence Status

There are six occurrences reported in the California Natural Diversity Database (2004). All occurrences are on National Forest System land. All seven occurrences are historical; additional occurrences not in CNDDDB as also listed below.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Parnassia cirrata* var. *cirrata* (Fringed grass-of-Parnassus)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1946	Vivian Creek, San Bernardino Mountains. Found in a springy meadow on a steep west slope, marsh, and wet banks of springy hillside w/ <i>Gentiana amarella</i> and <i>Pinus murrayana</i> . Exact location U. 3 collections mapped together to include area around 8000 ft. SBNF.	SBD

2	U	1965	Mill Creek Mine (Quarry), Mill Creek Canyon. Found in moist rocky was w/ <i>Pinus ponderosa</i> and <i>Muhlenbergia andina</i> . Exact location U. Needs fieldwork. SBNF.	SBD
3	U	1879	Gilman Canyon, Mount San Bernardino. Type locality. Exact location U. Needs fieldwork.	SBD
4	U	1970	Alder Gulch, South Fork. San Gabriel Mountains. Calcareous seep, N-slope. Semi-sunny. Exact location U. Needs fieldwork. ANF.	LA
5	U	1968	San Gabriel Mts., W of heliport. T2N R9W NE ¼ Sec. 3. Steep wet SE-facing calcareous meadow. Needs fieldwork. ANF.	LA
6	U	1967	North Fork of San Gabriel River. Near Falling Springs, between Coldbrook and Crystal Lake. Sunny, S-facing sloping calcareous streamlet. Exact location U. Four collections mapped as best guess to include area around Falling Springs at 4100 ft. ANF.	LA
*(RSA)	U	1967	Yucca Flats summer housing tract, San Gabriel Mtns. Elev. ca. 4100'. ANF. Is this special use recreational cabin tract?	LA
467323 (RSA)	U	1915	S. Fork San Gabriel River. (Mohr/RSA)	LA

98311 (UCR)	U	1992	San Gorgonio Wilderness Area: Momyer Creek trail, in Mill Creek wash, ca 0.5 mi (airline) N of town of Forest Falls. Along Alder Creek, T1S/R1E/S8 (White/UCR)	SBD
83432 (UCR)	U	1993	Mill Creek Canyon, Falls Creek near historic "Dobbs Cabin" site, T1S/R1E/S9 (White/UCR)	SBD

- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

Threats

Threats to *Parnassia cirrata* var. *cirrata* have not been determined. However, many of the occurrences are in areas that receive high levels of recreation use or have been subject to historical disturbance regimes. On the San Bernardino National Forest, the occurrence at Mill Creek Mine (occ. no. 2) may have been affected by historic quarrying activities. Occurrence no. 1 at Vivian Creek may be affected by various recreational activities such as trail use in the area. Effects at Falls Creek are unknown at this time. On the Angeles National Forest, the occurrence near Falling Springs (occ. no. 6) may be affected by its proximity to Highway 39. Occurrence no. 5 may be affected by its proximity to the heliport. Finally, the occurrence within the Yucca Flat tract may be affected by recreational activities, but more information is needed to assess threats at this location.

Conservation and Management Considerations

The following list of conservation practices should be considered for *Parnassia cirrata* var. *cirrata* :

- Prepare a Habitat Management Guide for vernal wetlands on the SBNF, including mesic swales, seeps and springs that addresses habitat for *Parnassia cirrata* var. *cirrata* .
- Survey all new occurrences of *Parnassia cirrata* var. *cirrata* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Parnassia cirrata* var. *cirrata* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Parnassia cirrata* var. *cirrata* in the planning area using

National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Parnassia cirrata var. *cirrata* is an uncommon species, known from only several locations on the Angeles and San Bernardino National Forests. Occurrence information has not been updated in over thirty years, plants are located near roads and in areas of known high recreation use, however types and extent of threats are unknown.

Based on what is known about this species distribution and considering the threat inherent in poor knowledge, *Parnassia cirrata* var. *cirrata* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	A	A	A	A	B	A

Management of this species is tied to riparian area and meadow management. Implementation of the SBNF Meadow Habitat Management Guide will assist in the management of this species where it occurs in wet meadows as would riparian standards during environmental analysis of new projects. On the San Bernardino National Forest, the Vivian Creek occurrence and the Mill Creek Mine occurrence occur within the existing San Gorgonio Wilderness. This designation remains constant across all alternatives. The Falls Creek occurrence may be present just outside the wilderness boundary.

In Alternative 1, this area is zoned as Back Country Non-Motorized and would remain so under Alternatives 2, 4 and 6. In Alternative 3, the area would be recommended as the Raywood Flat B Wilderness addition. In Alternative 4a this area is zoned as Developed Area Interface and Back Country Non-Motorized. In Alternative 5, these locations would receive a reduced level of protection as the current Back Country Non-Motorized zoning would change to Back Country.

There is potential habitat on NFS lands between the Mill Creek Mine occurrence and the Gilman Canyon occurrence. Under Alternatives 2, 3, 4 and 4a, the area south of and adjacent to the Mill Creek Mine occurrence would become Wilderness as the Raywood Flat B parcels are added. This would also

occur in Alternative 6 and the lands south of the Raywood Flat B wilderness addition would become zoned as Back Country Non-Motorized. This would provide a beneficial effect to potential habitat to the south adjacent to occupied habitat on private land in Gilman Canyon. In Alternative 5, the lands south of and adjacent to the Mill Creek Mine and the Gilman Canyon occurrence would experience a reduced level of protection as the zoning changed from the existing Back Country Non-motorized zoning to Back Country.

On the ANF, the Falling Springs occurrence is located within Developed Area Interface in all Alternatives except 4a which is combination of Developed Area Interface and Back Country Non-Motorized zoning. Topography is steep at this location.

Due to the fact that two of these locations on the SBNF are in the existing wilderness, one is adjacent to the wilderness, and others are in locations with no roads, and the ANF location is in steep topography, the increased emphasis on motorized recreation in Alternative 5 would not affect this taxon to a great extent; the predicted outcomes reflect this situation.

Preparation of a Habitat Management Guide to address this species would be expected to have a higher priority and happen sooner under Alternatives 2, 3, 4, 4a and 6. The response time and effectiveness of impact identification and management would be expected to be higher under Alternatives 3 and 6.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	A	A	A	A	B	A

The occurrence in Gilman Canyon on Mt. San Bernardino may be on private land, however it is landlocked by NFS lands. For the southern California locations that are known, viability of this species appears to depend almost entirely on NFS management. By maintaining the current distribution of *Parnassia cirrata* var. *cirrata* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Parnassia cirrata* var. *cirrata* to suffer a decline in its overall distribution.

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Packera ionophylla

Pedicularis dudleyi

Pedicularis dudleyi

Pedicularis dudleyi Elmer (Dudley's lousewort)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Pedicularis dudleyi was historically found along the central California coast from San Mateo County south to San Luis Obispo County and is now known from nine occurrences in Monterey, San Mateo, and San Luis Obispo counties (California Native Plant Society 2001).

Distribution in the Planning Area

Five of the nine occurrences of *Pedicularis dudleyi* are located on the Los Padres National Forest (California Natural Diversity Database 2004). One of these occurrences is also partially on land owned by the Boy Scouts of America (Pico Blanco Boy Scout Camp). These five occurrences of *Pedicularis dudleyi*, plus one other on private land, are found in the Little Sur River watershed (California Natural Diversity Database 2004).

Taxonomy and Natural History

Pedicularis dudleyi is a dicot in the Scrophulariaceae (figwort family). Vorobik (1993) notes that the plants from Arroyo de la Cruz in San Luis Obispo County (the occurrences near San Simeon) are morphologically distinct from other populations and warrant further study. *Pedicularis dudleyi* is a perennial herb 4 to 6 inches (1-1.5 dm) tall with pinnately compound, basal, leaves, which are longer than the flowering stem. The lobes of the leaves are elliptic-oblong. The corolla is beaked, 2-lipped, and pale red to pinkish. The fruit is a flattened capsule containing 2-4 seeds. A similar looking species, *Pedicularis densiflora*, has a smaller lower lip and occurs in oak woodland and chaparral communities.

Pedicularis dudleyi blooms April–June. A hemiparasite, *Pedicularis dudleyi* is dependent on formation of root-to-root connections with other vascular plant species.

Habitat Description

Pedicularis dudleyi, an herbaceous perennial, grows in serpentine chaparral, grasslands, and in shaded areas in redwood or mixed evergreen forest (Stephenson and Calcarone 1999). Only the plants found in the Arroyo de la Cruz area are found on serpentine substrates.

Habitat at the southern edge of the species range in the Arroyo de la Cruz area does not appear threatened at this time (Keil and McLeod 1987). This habitat is located on private land and the plants here may represent an undescribed taxon related to but different than *Pedicularis dudleyi* (California Natural Diversity Data Base 2004).

Along the Big Sur coast of the Monterey Ranger District, in the Little Sur River watershed, is a collection of *Pedicularis dudleyi* occurrences. They are subject to some habitat degradation from trampling, trail maintenance, and accelerated erosion due to their location on and adjacent to trails and campground facilities. Riggins (1982) documented that plants were thriving in this area and habitat was noted (Moss, July 1987) to be in good condition though there was some encroachment from tan oak.

At the northern edge of the plant's current range, *Pedicularis dudleyi* is found in Portola State Park (Occ. #3). Three of the eight or so colonies found here could be threatened by hikers due to proximity to trails.

Occurrence Status

There is no reliable data documenting variation in plant abundance over time for any of the occurrences found on NFS land, partly due to inconsistencies in the manner in which botanists have reported the boundaries of an occurrence. On NFS land, botanists have reported that the apparent trend of documented occurrences appears to be static. One occurrence in Portola State Park is reported to have declined from 110 plants in 1983 to 56 plants in 1994. This decrease may be due to sampling error but it could also be due to an actual decline in abundance.

One historic occurrence (#5) located near Portola State Park on a road bank is presumed to be extirpated, as there are no reports of plants being present at this site since 1903. In Santa Cruz County, an occurrence of *Pedicularis dudleyi* near Aptos has also been apparently extirpated by development (California Natural Diversity Data Base 2004).

The following counts of *Pedicularis dudleyi* have been recorded as reported by the California Natural Diversity Data Base (2004):

OCCURRENCE DATA – *Pedicularis dudleyi* (Dudley's lousewort)

Occurrence No.	No. of Plants	Year Reported	Metapopulation
3	56	1994	Portola State Park
2	200	1982	Little Sur River
7	72	1982	Little Sur River
11	11	1982	Little Sur River
12	600	1982	Little Sur River
13	253	1982	Little Sur River
14	6	1982	Little Sur River
8	1000	1983	San Simeon*
10	50	1985	San Simeon*

* = Plants here may be an undescribed taxon related to *Pedicularis dudleyi*

Threats

On the central coast of California, *Pedicularis dudleyi* is inherently rare and not naturally well distributed. This herbaceous perennial has a very restricted distribution and specializes on small, patchily distributed habitats. However, because of the size of the metapopulation found on NFS land (more than 1,130 plants) this metapopulation has a low risk of being extirpated. This conclusion is based on the following:

Habitat for *Pedicularis dudleyi* is not outside the range of natural variability (Monterey Coast Habitat Account 2002) and is not in a state of decline. In addition, this species appears to tolerate low levels of disturbance as it has been observed in slightly disturbed, loose soil in forest habitat; cut banks along hiking trails and roads; and on alluvium in the floodplain of the Little Sur River (California Natural Diversity Database 2004).

There is no evidence that populations of *Pedicularis dudleyi* are in decline.

Habitat alteration is not likely to occur on a gross scale. Occupied habitat is not located in a grazing

allotment and there are no current proposals to conduct fuel treatments in this area.

Conservation and Management Considerations

- The single known metapopulation of *Pedicularis dudleyi* on NFS land consists of about 1,300 plants on a total of less than 10 acres of land. Conduct a site-specific assessment to evaluate conservation measures such as creation of signage at trailhead, altering trail alignments, visitor education, or access restrictions.
- Use education and interpretation to ensure that impacts from recreation use are minimized in occupied habitats such as the areas around Pico Blanco Boy Scout Camp, Jackson Camp, and Little Sur Camp. If monitoring indicates that education and interpretation are not effective in avoiding off-trail impacts consider placement of natural barriers or re-routing of the Trail 3E08.2 to avoid impacts to *Pedicularis dudleyi*.
- For three years, annually census the occurrences of *Pedicularis dudleyi* found along the Little Sur River to determine annual variations in detectability and to ascertain the trends in abundance. Use this information to develop a long term monitoring protocol.

Evaluation of Current Situation and Threats on National Forest System Lands

Pedicularis dudleyi is known from just nine occurrences and five of these are on National Forest System lands along the Little Sur River, an area subject to incidental impacts from dispersed recreation but otherwise secure from gross land disturbing events. The five occurrences of *Pedicularis dudleyi* are all found in designated wilderness and most are within the corridor of a wild and scenic river.

Based upon the above analysis *Pedicularis dudleyi* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Pedicularis dudleyi is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Pedicularis dudleyi* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Pedicularis dudleyi* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Parnassia cirrata var. cirrata

Penstemon californicus

Penstemon californicus

Penstemon californicus (Munz & I.M. Johnston) Keck (California beardtongue)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3?; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-2

General Distribution

Penstemon californicus occurs in California only in the San Jacinto and Santa Rosa Mountains, with a doubtful historic occurrence near Aguanga. The range of this species also includes Sierra Juarez and Sierra de San Pedro Martir in Baja California Norte (USDA Forest Service 2002; California Natural Diversity Database 2004).

Distribution in the Planning Area

The known occurrences of *Penstemon californicus* on the San Bernardino National Forest are distributed in and around Garner Valley, Quinn Flat, east of Toro Peak, near Kenworthy Station, and Desert Divide. A single record in Orange County, at Weir Canyon in the Santa Ana Mountains, is dubious (Roberts pers. comm.) but if confirmed would raise the possibility that this species may occur on the Trabuco District of the CNF.

Taxonomy and Natural History

Penstemon californicus is a dicotyledon in the plantain family (*Plantaginaceae*) (APGII 2003). This species flowers from May-June in California; in Baja California, flowering can extend through August (Pierce and Beauchamp 1979), probably in response to summer rainfall. *Penstemon californicus* is a 10-30 cm perennial that is spreading to ascending. The erect stems form matted tufts with long dark-barked prostrate branches from a shrubby caudex. The hairs are appressed, flat, scale-like, and backward-pointing. The herbage is hoary, strigose, and has fine, reflected, flattened, simple hairs. The leaves are opposite, 7-15 mm, linear to narrowly oblanceolate, entire, veinless, petioled, and covered on both sides

with an ashy puberulence.

Flowers are showy in a narrow thrysoid panicle. The flowers are minutely glandular, 5-8 cm long, and 15-20 mm wide. The calyx is 4-8.5 mm with ovate lobes. The calyx is as hairy as on the leaves and may also be sparsely glandular. The corolla is 14-18 mm, narrowly tubular-funnelform, (blue-) purple, white inside, dark-lined, sparsely glandular outside, and with a sparsely hairy floor. The corolla is strongly two-lipped; both lips are spreading, the upper lip is 6 mm long with 2 lobes approximately 3 mm long, and the lower lip is 4 mm long with 3 lobes approximately 2 mm long. The corolla is sparsely pubescent and weakly bearded at the orifice without any strong guidelines. It is not plicate in the throat.

There are 4 fertile stamens that are paired. The staminodes is yellow-bearded throughout or chiefly apically. The fertile filaments have few or no hairs. The anther sacs are 1-1.3 mm, dehiscent through the full length, opening from free tips throughout, are extremely divergent, oblong, and 1 mm long (Holmgren 1993, Pierce and Beauchamp 1979).

Habitat Description

Penstemon californicus inhabits sandy or rocky soils in chaparral, yellow pine forest, or pinyon/juniper woodland between 1200-2300 m. This species has also been found in lower montane coniferous forest, generally at the ecotone with chaparral. At some occurrences, *Penstemon californicus* is associated with *Arabis johnstonii*, *Quercus wislizenii*, and *Adenostoma sparsifolium* (California Natural Diversity Database 2004, Holmgren 1993).

Occurrence Status

There are several occurrences on the San Bernardino National Forest, most within active grazing allotments. At least two cattle enclosures within the grazing allotment contain small portions of two occurrences of this plant. One occurrence may be in the Santa Rosa Wilderness (USDA Forest Service 2002). The historic (1882) record by Parrish from Aguanga may have been collected from the San Jacinto Mountains (possibly lodging at Aguanga?), as the only other collections by Parrish documented in UC/JEPS for June of 1882 in Riverside County are from higher elevations at San Jacinto Mountain, and habitat near Aguanga is very different than that at the known localities. The Weir Canyon collection from Orange County also seems unlikely based on habitat, and is a possible mis-identification needing confirmation (Roberts 2005).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Penstemon californicus* (California beardtongue)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1977	Kenworthy Station. 1937 Munz collection from 'Kenworthy' also attributed to this site. SBNF/PVT?	RIV
2	U	1978	ca. 1 mi. NW of Kenworthy Station. Two populations ca. 0.15 mi. apart. SBNF.	RIV
3	U	1977	Ca. 1.5 mi. NW of Kenworthy Station. From 'slopes on NE side of Garner Valley immediately adjacent to valley floor just NW of JCT of Morris Ranch Rd and Hwy 74' also attributed to this site. SBNF.	RIV
4	100-1000	1982	Quinn Flat, Garner Valley. Associated w/ <i>Pinus jeffreyi</i> , few <i>P. quadrifolia</i> , <i>Adenostoma fasciculatum</i> , <i>A. sparsifolium</i> , <i>Arabis johnstonii</i> , <i>Echinocereus engelmannii</i> ssp. <i>munzii</i> . Light to moderate grazing and trampling by cattle. Type locality. Several Munz and one Derby collection attributed to this site. SBNF.	RIV
5	100-1000	1982	Desert Divide near Pyramid Peak, on Pacific Crest Trail. w/ <i>Arabis johnstonii</i> , <i>Eriogonum wrightii</i> ssp. <i>subscaposum</i> , <i>E. umbellatum</i> , surrounded by <i>Arctostaphylos glandulosa</i> and <i>A. fasciculatum</i> . On granitic derived gravel. Trail construction and off-trail traffic by hikers and cattle are visible threats. SBNF.	RIV

6	U	1977	Ca. 1.5 mi. N of the W end of Horse Creek Ridge. SBNF.	RIV
7 (Parrish)	U	1882	Aguanga. PVT.	RIV
8	U	1938	E of Toro Peak, Santa Rosa Mountains. On flinty ridge. SBNF or Santa Rosa Indian Reservation?	RIV
9	U	1982	S end of Garner Valley, Pine Meadow, E of Pine to Palms Hwy, San Jacinto Mountains. On granitic soils with Pleistocene non-marine deposits of eroded clay. Associated w/ <i>Adenostoma</i> , <i>Quercus wislizenii</i> , <i>Arabis johnstonii</i> . SBNF.	RIV
10	U	1982	NW of Kenworthy Station, E of Pines to Palms Hwy, Garner Valley, San Jacinto Mountains. On granitic soil w/ Pleistocene non-marine deposits of eroded clay. Associated w/ <i>Adenostoma</i> , <i>Quercus wislizenii</i> , <i>Arabis johnstonii</i> . PVT.	RIV
11	U	1982	Quinn Flat, Garner Valley. On granitic soil w/ Pleistocene nonmarine deposits on eroded clay. w/ <i>Adenostoma sparsifolium</i> , <i>Quercus wislizenii</i> , <i>Arabis johnstonii</i> . Urbanization and grazing are threats. PVT.	RIV

12	U	1982	Between Quinn Flat and Goff Flat, N Morris Ranch Rd, E Garner Valley, San Jacinto Mountains. On granitic soil w/ Pleistocene nonmarine sands of eroded clay. Associated with <i>Adenostoma sparsifolium</i> , <i>Quercus wislizenii</i> , <i>Arabis johnstonii</i> . Urbanization and grazing are threats. SBNF.	RIV
650906 (RSA)	U	1981	Santa Ana Mts. Region., Riverside Fwy. 91 E. to Imperial Hwy., S to Nohl Ranch Rd., E to Serrano Ave, S to Hidden Cyn. Rd., 6 km into Weir Cyn. (Liggett/RSA). Private. Needs confirmation.	Orange
58861 (RSA)	U	1950	San Jacinto Mts. Region, 2 mi. NW of Pipe Creek, S end of San Jacinto Mts. Elev. 4600 ft. (Munz/RSA)	RIV
79805 (RSA)	U	1922	San Jacinto Mts. Region, along the low hill slopes on E side of Hemet Valley, ca. 1 mi. W of Kenworthy. (Peirson/RSA)	RIV
123356 (UCR)	U	1997	San Bernardino Nat'l Forest, jct. Of Cedar Springs Trail and Pacific Crest Trail/ T6S/R4E/S9 (Schwenn/UCR)	RIV
139250 (UCR)	U	2003	Garner Valley, foothills on NE side of the valley, near Morris Ranch Rd. ca. 0.25 mi. NW of Kenworthy Ranger Station (Sanders/UCR)	RIV

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *RIV = Riverside County*

Threats

Threats to *Penstemon californicus* occurrences on National Forest System lands include grazing and trampling by cattle, vehicle use off classified roads, fuel break construction, trampling by hikers, and fuels and vegetation management. On private lands, development in the Garner Valley area also threatens this species.

Conservation and Management Considerations

The primary short-term conservation strategy for *Penstemon californicus* is to prepare and implement a habitat management guide for this and associated species and to improve the knowledge of its distribution and ecology. The following is a list of conservation practices that should be considered for this species:

- Write and implement a habitat management guide for *Penstemon californicus* and associated sensitive species (e.g. *Arabis johnstonii* and *Androsace elongata* ssp. *acuta*).
- Survey all new occurrences of *Penstemon californicus* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Penstemon californicus* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Penstemon californicus* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.
- Monitor effects of grazing seasonality and intensity where this taxon occurs within active allotments. If adverse effects are identified, consider modifying terms of permits to minimize effects.

Evaluation of Current Situation and Threats on National Forest System Lands

Penstemon californicus is a restricted narrow endemic species known in the planning area from two general areas in the southern San Jacinto and Santa Rosa Mountains. None of the known localities are well protected from likely threats. Grazing and vegetation management are the most prominent threats, although impacts related to roads and trails use and maintenance are identified.

Based on the above analysis, *Penstemon californicus* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	A	C	A

Penstemon californicus is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The primary ongoing threats to this species on NFS lands are grazing and vegetation/fuels management, and it is not known to what extent the effects of these activities are adverse to this species persistence. Grazing effects are expected to be similar across all alternatives except Alternative 6, under which capability and suitability of range could preclude grazing at several occurrences. Trails use and maintenance along the Desert Divide/PCT will be a minor ongoing threat, equally under all alternatives. Standards for recreation helps avoid/minimize effects along PCT. Consideration of Standards related to surveys, roads and recreation management factor into the following outcomes.

Under Alternatives 1 and 5, this species would be at continued risk as a result of the amount of suitable grazing acres retained or minimally reduced. Identification of response in these alternatives would be relatively slow. This would combine with limited knowledge about the severity of the threat. Under alternatives 2, 3, 4, 4a and 6, grazing would continue to pose a risk, at reduced levels; an increase in knowledge and management would partially offset this risk. Plants would be at continued risk as a result of likely vegetation treatments in the core of its distribution (Garner Valley/Morris Ranch/Quinn Flat). Risks associated with vegetation management would exist under all alternatives, however increased knowledge and management under 2, 3, 4, 4a, and 6 would largely offset this threat.

Under Alternatives 3, 4a and 6, the proposed wilderness designations for Pyramid Peak would provide increased protection for this species. Under Alternative 5, areas east of Desert Divide currently zoned Back Country Non-Motorized would become Back Country, reducing protection and introducing potential new threats, especially near Morris Ranch Road. No locations are recommended for special area designations in this alternative. These land use zoning changes combined with minimal reduction in suitable grazing acres resulted in a lower outcome for Alternative 5.

Viability Outcomes for All Lands within Range of Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
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D	D	D	D	D	D	D
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Portions of this species range have been lost and continue to be lost as private land inholdings in Garner Valley are developed into residences and ranchettes. The potential for increased gaps in this species distribution within Garner Valley is high, although this is not expected to put the portions of this population on NFS lands at risk of extirpation.

By maintaining the current distribution of *Penstemon californicus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Penstemon californicus* to suffer a decline in its overall distribution.

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Personal communication

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Pedicularis dudleyi

Pentachaeta exilis ssp. aeolica

Pentachaeta exilis ssp. aeolica

Pentachaeta exilis (Gray) Keck ssp. *aeolica* Van Horn & Ornduff (Slender pentachaeta)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T1, S1.2 – (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Pentachaeta exilis ssp. *aeolica* is found in five locations in the inner south coast ranges of California. Two occurrences are located in Hernandez Valley, which is in San Benito County portion of the Diablo Range. Two other occurrences are located in an area often referred to as The Indians, which is in the northern Santa Lucia Mountains of Monterey County. The remaining occurrence, also in Monterey County, is on Fort Hunter Liggett (Hardham 5508 (SBBG), Painter 2004).

Distribution in the Planning Area

Two occurrences of *Pentachaeta exilis* ssp. *aeolica* are on the Los Padres National Forest near The Indians Ranger Station (California Natural Diversity Database 2004).

The Indians locations are in the headwaters of the Arroyo Seco Creek near Memorial Park Campground and Arroyo Seco Road. One colony is located about ¼ mile east of Arroyo Seco Road on a hiking trail (6E01) that leads to Junipero Serra Peak. This colony was last observed in 2002 (Foster) and is in an area that was documented by Yadon in 1977. The second colony is found almost immediately adjacent to Arroyo Seco Road in an area next to the trailhead for the trail (6E01) to Junipero Serra Peak.

Taxonomy and Natural History

Pentachaeta exilis ssp. *aeolica* is a dicot in the sunflower family (Asteraceae). It is one of two subspecies of *P. exilis* that occur in California. The subspecies differ in style branch length (2-3 mm in

subsp. *aeolica*; < 1 mm in subsp. *exilis*) and corolla color (yellow in subsp. *aeolica*; reddish in subsp. *exilis*) (van Horn 1973).

Pentachaeta exilis ssp. *aeolica* will soon be elevated to specific level as *P. aeolica* (Painter 2004).

Pentachaeta exilis ssp. *aeolica* is a low annual herb with greenish-brown to red stems. The leaves are filiform to narrowly linear, 1.2 inches (3 cm) long, and 1 mm wide. The involucre is narrowly to broadly campanulate and 3-6 mm high. The phyllaries are elliptic to obovate, green to red, and in two equal series. The heads are composed of yellow disk flowers and small or vestigial, white, ray flowers.

Pentachaeta exilis ssp. *aeolica* blooms April-May.

Habitat Description

Pentachaeta exilis ssp. *aeolica* is found below 2,000 feet (610 meters) elevation in grasslands or grassy openings within foothill pine woodlands (California Natural Diversity Database 2004).

In 1977 the trail that bisects one of the two colonies found on National Forest System land was a dirt road and some of the habitat for *Pentachaeta exilis* ssp. *aeolica* was impacted by off-highway vehicle use (Yadon 1977). No impacts from OHV use were noted in 2002 although the trail is downcut in places and is in need of maintenance (Foster 2002). Continued trail erosion may result in a small amount of habitat loss.

The second colony that is found almost immediately adjacent to Arroyo Seco Road in an area next to the trailhead for the trail (6E01) to Junipero Serra Peak was last monitored in 1993. Matthews, in a letter to the U.S. Forest Service (1999) indicates that this population, or portions of it, may have been extirpated by trespass livestock grazing. Matthews' letter also makes reference to barriers that were put in place in the early 1990s to protect this location from the impacts associated with unauthorized vehicular use. I conclude that on the Los Padres National Forest, about 0.1 acre of habitat for *Pentachaeta exilis* ssp. *aeolica* has been impacted by construction and use of a trailhead, and that current trail use continues to impact less than 0.1 acre of habitat. The placement of barriers to control vehicular access and use and the conversion of a one-time road into a wilderness trail has resulted in recent improvements in the quality of habitat for *Pentachaeta exilis* ssp. *aeolica*. Trespass cattle grazing occasionally degrade the quality of this habitat. The magnitude of grazing impact is poorly documented making it difficult to determine if this use is affecting trends in habitat quality.

Occurrence Status

Determining trends in the size of *Pentachaeta exilis* ssp. *aeolica* populations is complicated by this plant's life history. Limited data suggests that this annual plant responds favorably to fire disturbance and the number of plants that germinate and develop into mature plants each year fluctuates greatly in response to fire and climate cycles.

Despite a relatively robust collection history (CalFlora 2002), there is little information available concerning the size of the population(s) found in the Hernandez Valley area. Collections from this area date from 1930 to 1992 indicating that this population is apparently large enough to have persisted for at least 62 years under past and current land uses. There is no information available on the current size, vigor, and disposition of this occurrence of *Pentachaeta exilis* ssp. *aeolica*.

On the Los Padres National Forest, there are two discrete colonies of plants found in one general area. It is not explicitly clear which of these two colonies was the site of collections made in 1936, 1960 and 1968 although CNDDDB (2004) attributes them to the location adjacent to Arroyo Seco Road (Occurrence #2). About 10,000 plants were observed at this location in 1993. At Occurrence #3, Yadon reported "many" plants in 1977. A brief visit in 2002 found several hundred plants of *Pentachaeta exilis* ssp. *aeolica*. More data is needed to determine what if any population trends are occurring in these two colonies of *Pentachaeta exilis* ssp. *aeolica*.

OCCURRENCE DATA- *Pentachaeta exilis* ssp. *aeolica* (Slender Pentachaeta)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1964	COALINGA ROAD, ABOUT 7.2 MILES SOUTH OF JUNCTION WITH CLEAR CREEK ROAD. MAPPED ALONG ROAD ABOVE THE SAN BENITO RIVER. ABOUT 1.5 MILES WNW OF THE FRE-SBT COUNTY LINE, T19S/R12E/S06	SAN BENITO
2	10,000+ in 1993	1993	JUST EAST OF INDIANS RANGER STATION, LOS PADRES NATIONAL FOREST. MAPPED ALONG EAST SIDE OF INDIANS ROAD, OPPOSITE THE RANGER STATION, T21S/R05E/S07	MON

3	U	1977	ABOUT 0.5 MILE NORTHEAST OF INDIANS RANGER STATION, LOS PADRES NATIONAL FOREST. ALONG BOTH SIDES OF DIRT ROAD HEADING EAST FROM RANGER STATION.	MON
4	10,000 in 1991, 10,000 + in 1992	1992	HERNANDEZ VALLEY, SOUTHEAST OF AIRSTRIP AND ALONG CLEAR CREEK ROAD. TWO COLONIES MAPPED ALONG NORTH SIDE OF ROAD ABOVE CLEAR CREEK, T18S/R11E/S16	SAN BENITO
5	U	1957	2-3 MILES EAST OF HERNANDEZ. EXACT LOCATION NOT KNOWN, T18S/R11E/S23	SAN BENITO

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *MON = Monterey County*

Threats

Potential threats include foot traffic, grazing, and unauthorized off road travel by motor vehicles and bicycles.

Conservation and Management Considerations

On National Forest System land, *Pentachaeta exilis* ssp. *aeolica* is found in two colonies that are separated by a distance of less than ½ mile. Together, these two colonies occupy less than 10 acres of land. *Pentachaeta exilis* ssp. *aeolica* is an annual and as such it appears to be dependent on the periodic renewal of its seed bank. Fire disturbance may provide the necessary conditions for this periodic replenishment of the seed bank.

- Use education and interpretation to ensure that hikers remain on the designated Junipero Serra Trail. If monitoring indicates that education and interpretation are not effective in avoiding off-trail impacts consider placement of natural barriers or re-routing of the Junipero Serra Trail to avoid impacts to *Pentachaeta exilis* ssp. *aeolica*.
- Use prescribed fire to reduce surface litter and stimulate germination of *Pentachaeta exilis* ssp. *aeolica* in occupied habitats and to increase the suitability of unoccupied habitats.
- Control trespass livestock.
- For three consecutive years, annually census the occurrence of *Pentachaeta exilis* ssp. *aeolica* found along Junipero Serra Trail to determine annual variations in detectability and to ascertain the trends in abundance.

Evaluation of Current Situation and Threats on National Forest System Lands

Pentachaeta exilis ssp. *aeolica* is known from just two occurrences on the Los Padres National Forest in an area subject to impacts from dispersed recreation. Although this population of *Pentachaeta exilis* ssp. *aeolica* is moderately large (more than 10,000 plants in 1993), it occupies a relatively small area and as a result of this restricted geographic range *Pentachaeta exilis* ssp. *aeolica* is vulnerable to human and environmental threats.

Based upon the above analysis *Pentachaeta exilis* ssp. *aeolica* has been assigned the following threat category:

- 5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	B	B	B	C	B

Pentachaeta exilis ssp. *aeolica* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Pentachaeta exilis ssp. *aeolica* is inherently rare and not naturally well distributed. The lack of information regarding the colonizing ability, adaptability to changing environmental conditions, reproductive potential, or genetic variability of this taxon makes it difficult to predict its long-term

vulnerability. The microhabitat needs of this taxon and intensity, frequency, size, and type of natural disturbance optimal for persistence of this taxon are unknown. The vulnerability of this taxon to human-related activities and environmental changes is not known. Despite these numerous unknowns, it is possible to characterize differences between proposed land management plan alternatives based on the emphasis of the alternatives.

Under all alternatives, use of maps showing known locations during project planning and responses to fire incidents would reduce the likelihood that *Pentachaeta exilis* ssp. *aeolica* would be affected by gross, land disturbing activities. Under alternatives 3, 4, 4a, and 6, the greater emphasis on biodiversity and managing recreation in a sustainable manner would result in a greater likelihood that resources would be available for preventing impacts to habitat from trespass livestock and unauthorized off-road travel, and there would be a greater likelihood that efforts would be made to gather information on the type, intensity, and frequency of disturbance optimal for the persistence of this taxon.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

Although *Pentachaeta exilis* ssp. *aeolica* has been identified as a taxon of special concern (California Native Plant Society List 1B), there are few regulatory mechanisms at the federal or State level to regulate its conservation on private lands. Because there is only one other known location of *Pentachaeta exilis* ssp. *aeolica* off of National Forest System lands and this population is not currently subject to any form of protection, there is a moderate likelihood, based on limited information, that occurrences of *Pentachaeta exilis* ssp. *aeolica* on private land may become extirpated from human or environmental causes.

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Penstemon californicus

**Perideridia gairdneri ssp.
gairdneri**

Perideridia gairdneri ssp. gairdneri

Perideridia gairdneri (H. & A.) Math ssp. *gairdneri* (Gairdner's yampah)

Management Status

Federal: Forest Service: None; Bureau of Land Management: Sensitive

California: None

Heritage Rank: G5T3, S3.2 – Threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-3

General Distribution

Perideridia gairdneri ssp. *gairdneri* was once widely distributed in coastal counties of California from Mendocino south, but is now thought to be extirpated in the southern portion of its range (Los Angeles, Orange, and San Diego Counties) (California Native Plant Society 2001). It can be locally relatively common in the northern portion of the range (California Native Plant Society 2001).

Distribution in the Planning Area

Perideridia gairdneri ssp. *gairdneri* occurs on the Monterey Ranger District of the Los Padres National Forest, where there is an estimated 4 acres (1.6 hectares) of known habitat (Stephenson and Calcarone 1999). In addition there is an unclear location on the Los Padres National Forest in San Carpoforo Creek and Arroyo de la Cruz (Hoover et. al. (CAS)), according to Painter (per. comm.). Potential habitat for *Perideridia gairdneri* ssp. *gairdneri* exists on the Cleveland and Angeles National Forests.

Taxonomy and Natural History

Perideridia gairdneri ssp. *gairdneri* is a dicot in the carrot family (Apiaceae). Two subspecies are recognized for *Perideridia gairdneri*; the other subspecies, *borealis*, occurs in northern California and is distinguished by its clustered tuberous roots (Constance 1993).

Perideridia gairdneri ssp. *gairdneri* is a tuberous perennial herb that flowers June–October (California Native Plant Society 2001).

Habitat Description

Perideridia gairdneri ssp. *gairdneri* grows in mesic sites (including vernal pools) within coastal prairie, valley and foothill grasslands, chaparral, broad-leaved upland forests, and coastal pine stands from sea level to about 1,200 feet (365 meters) (Constance 1993, California Native Plant Society 2001).

Occurrence Status

Perideridia gairdneri ssp. *gairdneri* is considered to be at risk of extirpation in a portion of its range but it is found in sufficient numbers and distributed widely enough that the potential for extinction is thought to be low (California Native Plant Society 2001). The population trend of *Perideridia gairdneri* ssp. *gairdneri* on National Forest Service System lands is unknown (Stephenson and Calcarone 1999).

Threats

Perideridia gairdneri ssp. *gairdneri* has low vulnerability on National Forest System lands (Stephenson and Calcarone 1999). The plant is threatened by agriculture and urbanization in portions of its range (California Native Plant Society 2001).

Conservation and Management Considerations

There are no recommendations at this time.

Evaluation of Current Situation and Threats on National Forest System Lands

Based upon the above analysis *Perideridia gairdneri* ssp. *gairdneri* has been assigned the following threat category:

3. Common or widespread in plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Perideridia gairdneri* ssp. *gairdneri* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Perideridia gairdneri* ssp. *gairdneri* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Perideridia parishii ssp. parishii

Perideridia parishii (J. Coulter & Rose) Nelson & J.F. Macbr. ssp. *parishii* (Parish's yampah)

Management Status

Federal: None

California: None

Heritage Rank: G4T3T4; S2.2? (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 2-2-1

General Distribution

Perideridia parishii ssp. *parishii* occurs mainly in the mountains of Arizona, New Mexico, and Nevada , and, as a disjunct, in the San Bernardino Mountains (Constance 1993, California Native Plant Society 2001). The California Natural Diversity Database (2004) lists 22 occurrences of this species in southern California.

Distribution in the Planning Area

Within the province, this species is known only from the Mountaintop District and the San Gorgonio Wilderness of the San Bernardino National Forest. Occurrences are reported from Holcomb Valley, south of Big Bear Lake, north of Lake Arrowhead, southeast of Green Valley Lake, near South Fork Meadows, Big Meadows, in and around the Snow Valley Summer Home Tract, and Bluff Meadow (at Bluff Lake) (California Natural Diversity Database 2004).

Taxonomy and Natural History

Perideridia parishii ssp. *parishii* is a dicotyledon in the carrot family (Apiaceae). It is one of two subspecies of *P. parishii* that occurs in California (Constance 1993). Subspecies *parishii* occurs in the San Bernardino Mountains, but subspecies *latifolia* occurs in the San Jacinto, San Gabriel, and Cuyamaca Mountains (Constance 1980). *Perideridia parishii* ssp. *parishii* is a perennial herb that blooms June–August (California Native Plant Society 2001).

Perideridia parishii ssp. *parishii* is 1.5-9 dm with roots that are tuberous, single, 1-2.5 cm, and fusiform (carrot-like). The basal leaf petioles are 3-10 cm. The basal blade is 10-20 cm, more or less ovate, generally 1-ternate or 1-pinnate with 1-3 pairs of leaflets. The leaflets are 3-15 cm, more or less lanceolate and entire. The cauline leaves are 1-ternate. The inflorescence consists of umbels that are concave on top. The rays are generally 6-11 and unequal. There are 3-5 bractlets that are generally less than the pedicels. The styles are 1 mm. Fruit are 3-5 mm and oblong to more or less ovate (Constance 1993).

Habitat Description

Perideridia parishii ssp. *parishii* inhabits moist or wet meadows, usually around lakes or streams within upper montane conifer forests, at elevations of 4,800–9,850 feet (1,465–3,000 meters) (Krantz 1990; California Native Plant Society 2001).

Occurrence Status

There are 22 occurrences of *Perideridia parishii* ssp. *parishii* (California Natural Diversity Database 2004). Fourteen of these occurrences are on the San Bernardino National Forest, including one which is in the San Gorgonio Wilderness area.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Perideridia parishii* ssp. *parishii* (Parish's yampah)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1981	South Fork Santa Ana River just below S. Fork Meadows. Mapped between trail and river ca. 0.7 mi. SSE of Poopout Hill. SBNF-San Gorgonio Wilderness.	SBD
2	U	1979	Santa Ana River at Big Meadows. Mapped just N of river and ca. 0.5 mi. W of Heart Bar Campground. SBNF.	SBD

3	U	1984	Erwin Lake. Wet Meadow w/ <i>Ivesia argyrocoma</i> , <i>Linanthus killipii</i> , <i>Poa atropurpurea</i> , <i>Pyrrocoma uniflora gossypina</i> , <i>Packera bernardina</i> , <i>Taraxacum californicum</i> , <i>Thelypodium stenopetalum</i> . Mapped in S ½ of Erwin Lake. PVT.	SBD
4	U	1984	Pan Hot Springs just W of Baldwin Lake. Wet meadow w/ <i>Arabis parishii</i> , <i>Castilleja cinerea</i> , <i>Poa atropurpurea</i> , <i>Pyrrocoma uniflora gossypina</i> , <i>Packera bernardina</i> , <i>Taraxacum californicum</i> , <i>Sidalcea pedata</i> , <i>Thelypodium stenopetalum</i> . Threat = grazing. City of Big Bear.	SBD
5	U	1984	Bluff Lake, S of Big Bear Lake. Wet meadow w/ <i>Castilleja lasiorhyncha</i> , <i>Poa atropurpurea</i> , <i>Taraxacum californicum</i> , <i>Sidalcea pedata</i> , <i>Lilium parryi</i> . Two colonies: 1 large one @ E end of Lake, 1 small one along W side of Lake. Historical horse grazing, recreation, development of recreational facilities. Currently owned/protected by The Wildlands Conservancy.	SBD
6	U	1984	S shore of Big Bear Lake at Metcalf Bay. Wet meadow w/ <i>Castilleja lasiorhyncha</i> , <i>C. cinerea</i> , <i>C. montigena</i> , <i>Poa atropurpurea</i> , <i>Mimulus exiguus</i> , <i>M. purpureus</i> , <i>Sidalcea pedata</i> , <i>Packera bernardina</i> . PVT.	SBD
7	U	1979	Coldbrook Campground just S of City of Big Bear Lake. SBNF.	SBD

8	20	1994	S shore of Big Bear Lake between Treasure Island and Fischer Cove. Meadow w/ <i>Sidalcea pedata</i> , <i>Calochortus palmeri</i> , <i>Castilleja lasiorhyncha</i> . Threat = foot traffic. SBNF.	SBD
9	U	1979	S end of Holcomb Valley just NW of Old Baldy Council Camp. SBNF.	SBD
10	U	1984	W side of Holcomb Valley, ca. 0.5 mi. NW of Old Baldy Council Camp. Meadow w/ <i>Heuchera parishii</i> , <i>Taraxacum californicum</i> , <i>Packeria bernardina</i> , <i>Pyrrocoma uniflora</i> ssp. <i>gossypina</i> , <i>Poa atropurpurea</i> , <i>Castilleja lasiorhyncha</i> , <i>C. cinerea</i> , <i>C. montigena</i> , <i>Mimulus purpureus</i> . BSA off-road vehicle use and grazing. SBNF.	SBD
11	U	1984	Eagle Point along S side of Big Bear Lake. Mapped just N of Oriole Dr. and Swan Dr. and NE of Pheasant Dr. Meadow drained by annual spring crossing a pebble plain. W/ <i>Sidalcea pedata</i> , <i>Poa atropurpurea</i> , <i>Pyrrocoma uniflora gossypina</i> and surrounded by <i>Pinus jeffreyi</i> series. Vulnerable to trespass and off-road vehicle use. PVT.	SBD

12	U	1984	Upper Holcomb Valley. Meadow w/ <i>Thelypodium stenopetalum</i> , <i>Taraxacum californicum</i> , <i>Packera bernardina</i> , <i>Pyrrocoma uniflora gossypina</i> , <i>Phlox dolichantha</i> , <i>Castilleja lasiorhyncha</i> , <i>C. cinerea</i> , <i>C. montigena</i> , <i>Mimulus exiguus</i> , <i>M. purpureus</i> . Mapped in SE portion of the valley E of Holcomb Valley Campground. SBNF.	SBD
13	U	1989	SE of Running Springs between Running Springs School and Deer Lick Ranger Station. In swales and springs w/in mixed conifer forest. Associated w/ <i>Castilleja lasiorhyncha</i> , <i>Mimulus palmeri</i> , <i>M. androsaceus</i> , <i>Trifolium microcephalum</i> . PVT proposed for mini-storage development.	SBD
14	U	1978	N of HWY 30 and E of Green Valley Trail, SE of Green Valley Lake. Meadow consisting of <i>Carex</i> /forb series surrounded by <i>Pinus jeffreyi</i> . W/ <i>Carex athrostachya</i> , <i>Juncus macrandrus</i> , <i>Eleocharis macrostachya</i> , <i>Horkelia bolanderi</i> , <i>Achillea millefolium</i> , <i>Castilleja miniata</i> . Small intermittent stream just N and W of Snow Valley summer home tract and meadow between the homes. Plants sparse (1-2 plants/sq. ft.) along stream and dense (38 plants/sq. ft.) in the dry meadow. Potential threat = trampling. SBNF.	SBD

15	50	1978	Little Green Valley, SE of Green Valley Lake. In wet meadow in the middle of Little Green Valley YMCA camp. Wet meadow w/ <i>Veratrum californicum</i> , <i>Urtica holosericea</i> , <i>Stachys albens</i> , <i>Carex senta</i> , <i>C. athrostachya</i> , <i>Juncus</i> , <i>Achillea millefolium</i> , <i>Potentilla glandulosa</i> , <i>Mimulus floribundus</i> , <i>Epilobium paniculatum</i> , <i>Aster occidentalis</i> . PVT trampling and incidental vehicle damage.	SBD
16	U	U	N of HWY 30 near HWY 173 at Crest Park, S of Lake Arrowhead. Land owner: U.	SBD
17	75	1992	N of Lake Arrowhead along HWY 173, S of falls on Willow Creek. Dry site w/ yellow pine and oak overstory. Associated w/ <i>Allium</i> and <i>Bloomeria crocea</i> . Next to heavily used motorcycle trail. Two colonies. SBNF.	SBD
18	1	1992	Ca. 0.5 mi. WNW of Rock Camp Guard Station, N of Lake Arrowhead. Streambank w/ <i>Salix lasiolepis</i> , <i>Rosa californica</i> , <i>Potentilla glandulosa</i> . SBNF.	SBD
19	U	1982	Just N of N Shore Campground on E side of Lake Arrowhead. 0.2 mi. N of 3N20 on right side of road. Meadow w/ <i>Castilleja lasiorhyncha</i> , <i>Carex</i> , <i>Juncus</i> in <i>Pinus jeffreyi</i> series. SBNF.	SBD

20	U 1356 890	U 2004 2004	Ash Meadows, N of Lake Arrowhead. SBNF. Large occurrence west of Forest Road 2N29Y in Section 2 of Lake Arrowhead Quad, mapped by R.T. Hawke for the SBNF. Within Ash Meadows on southeast side of Ash Meadows Road 2N75, mapped by N. Fraga/Rancho Santa Ana Botanic Garden.	SBD
21	U	U	Vicinity of Maloney Canyon and Stove Flats, N of Lake Arrowhead. NE side of jeep trail. SBNF.	SBD
22	U 10	U 2004	E of Willow Creek ca. 0.7 mi. NW of Ash Meadows, N of Lake Arrowhead. SBNF. Along Willow Creek Road, 3N34 near intersection with Squints Ranch road 3N38. Mapped by L. Gross/Rancho Santa Ana Botanic Garden for the SBNF.	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Primary threats to *Perideridia parishii* ssp. *parishii* on Forest System lands are hydrological impacts from ground-disturbing activities (especially during winter and spring when soils are wet), water diversions, fire suppression activities, roads and road maintenance, non-native species invasion, development projects, unauthorized vehicle use off of designated roads, trampling from hikers, and other forest uses. This species frequently occurs in meadow habitat along with federally endangered species and other rare plants, which reduces the level of threat by virtue of increased environmental protections. Within the last ten years many habitat protection measures have been completed on the San Bernardino

National Forest that have reduced ground disturbing activities.

The main threat to *Perideridia parishii* ssp. *parishii* occurrences off of Forest System lands is extirpation and habitat loss from residential development.

Conservation and Management Considerations

The short-term conservation strategy for *Perideridia parishii* ssp. *parishii* is to develop a Habitat Management Guide and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Prepare a Habitat Management Guide for vernal wetlands on the SBNF, including mesic swales, seeps and springs. This Guide should specifically address *Perideridia parishii* ssp. *parishii* and associated mesic species including *Castilleja lasiorhynca*, *Calochortus parmeri* var. *parmeri*, *Mimulus exiguus*, *Phacelia mojavensis*, *Phacelia exilis*, and *Navarretia penninsularis* where they occur on the SBNF.
- Survey all new occurrences of *Perideridia parishii* ssp. *parishii* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Perideridia parishii* ssp. *parishii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Perideridia parishii* ssp. *parishii* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Perideridia parishii ssp. *parishii* is a rare, narrowly-distributed disjunct species, known mainly from the mountains of Arizona, New Mexico, and Nevada and limited in the Province to the San Bernardino Mountains. It is protected in the San Bernardino Mountains to a large extent through its co-occurrence with federally listed species, its location within designated wilderness and management of riparian habitat. The Bluff Lake occurrence on private land is protected in perpetuity.

Based on this analysis, *Perideridia parishii* ssp. *parishii* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Perideridia parishii*

ssp. parishii would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Perideridia parishii* *ssp. parishii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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**Perideridia gairdneri ssp.
gairdneri**

Phacelia exilis

Phacelia exilis

Phacelia exilis (A. Gray) G.J. Lee (Transverse Range phacelia)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3Q; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Phacelia exilis occurs in the western Transverse Range and Sierra Nevada in Tulare, Kern, Ventura, Los Angeles, and San Bernardino counties (California Native Plant Society 2001).

Distribution in the Planning Area

Phacelia exilis occurs in the San Bernardino National Forest in the Big Bear area, and possibly from the Western Transverse Range on the ANF and LPNF. This species has been collected on the SBNF from Van Dusen Canyon, East Holcomb Valley, the Castle Glen Preserve, and the north shore of Baldwin Lake (Krantz et. al. draft 2000).

Taxonomy and Natural History

Phacelia exilis is a dicotyledon in the waterleaf family (Hydrophyllaceae). It was previously described as a variety of Mojave phacelia (*Phacelia mohavensis*) (California Native Plant Society 2001). Characters useful in separating the two species include length and color of the stamens, pollen color, color of the corolla base, corolla venation, and shape and color of the corolla lobes. (Lee 1988). The corollas of this species have translucent "windows", and this species is sometimes referred to by the common name "windows phacelia".

Phacelia exilis is an annual herb that flowers in June and July (California Native Plant Society 2001). Because *Phacelia exilis* is a short-lived annual, the proper timing of surveys is very important. High

annual variation in population size is expected.

Phacelia exilis is 5-25 cm. The stems are decumbent to erect, simple to branched at the base, short-hairy, and more or less glandular-puberulent. The leaves are 10-35 mm. The leaf blade is narrowly (ob) lanceolate, tapered to the petiole, and entire. The pedicel is 2-4 mm. The calyx lobes are 3-5 mm, 5-15 mm in fruit, unequal, linear to oblanceolate, puberulent, and short-hairy. The corolla is 5-8 mm, bell-shaped, deciduous, and has lavender lobes and lanceolate scales. The stamens are 5-9 mm, subequal, and puberulent. The styles are 5-8 mm and puberulent. Fruit are 3-5 mm, ovoid, short-hairy, and gland-dotted. There are 4-8 seeds that are 1-2 mm and pitted (Wilken et al. 1993).

Habitat Description

Phacelia exilis grows on moist sandy or gravelly substrates in montane coniferous forest, meadows and seeps, and dry streambeds at elevations of 3,600–8,850 feet (1,100-2,700 meters) (Wilken et al. 1993, California Native Plant Society 2001). In the Big Bear area, *Phacelia exilis* occurs in openings of conifer forest associated with seasonal or ephemeral drainages, and within moist areas of pebble plains.

Plant abundance is strongly correlated with annual rainfall, and known occurrences may be less vigorous or absent in a below-average rainfall year. Suitable habitat for *Phacelia exilis* on the SBNF is highly localized to seasonal and ephemeral wet areas, creating a patchy, locally dense distribution. However, the range of suitable habitat may fluctuate with precipitation. Suitable habitat on the SBNF is threatened by hydrological alteration, erosion, and deposition from ground-disturbing activities (especially in winter and spring when soils are wet), fire suppression activities, road maintenance, non-native species invasion, development projects, vehicle use off designated roads, and other forest uses.

Occurrence Status

Phacelia exilis is considered rare, but can be locally common in some areas (California Native Plant Society 2001).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Phacelia exilis* (Transverse Range phacelia)

Occurrence No.	No. of Plants	Year Reported	Location/Land Owner	County

*	120	2000	Arrastre Flat. On road berm of 3N32 near meadow. Conifer forest at the edge of a meadow. Growing with <i>Pinus jeffreyi</i> , <i>Lotus</i> sp., <i>Eriogonum</i> sp., <i>Cryptantha</i> sp., <i>Collinsia parviflora</i> , <i>Linanthus breviculus</i> , <i>Mimulus</i> sp. Sandy, weathered granite soil. Slope 0-10 ° . No visible disturbance, but potential threats include road widening and disturbance from road maintenance. SBNF.	SBD
*	U	1999	West side of 3N12 SW of Hitchcock Ranch. T3N, R1W, NE1/4 S36. Vernal drainage in between Forest roads 3N12A and 3N12B. 3N12B decommissioned and restored to protect pebble plain habitat in this area in 1999. Underground gas line near occurrence and possible limestone mining claim. (Kopp/USFS) SBNF	SBD
23151 (UCR)	U	1981	3.5 mi NW of Rt 18 on Van Dusen Canyon Rd, ½ mile above rd on left with <i>Eriogonum kennedyi</i> var. <i>austromontanum</i> . T2N, R1E, S4. (Ciano/UCR) SBNF	SBD
15936 (UCR)	U	1979	Along 3N16, ca. 3 mi W of Country Dump (N of Baldwin Lake) where rd to Burnt Flat turns NW. T3N, R1E, S35. (Clarke/UCR) SBNF	SBD
17506 (UCR)	U	1979	Arrastre Flat, NW of Baldwin Mine (Vasek/UCR) SBNF	SBD
603244 (RSA)	U	1941	Baldwin Lake (Woglum/UCR) Ownership:U	SBD
123740 (UCR)	U	2001	South of Baldwin Lake, ca. 0.6 mi SE of junction of Ca Hwy 38 and Shay Rd. slopes near the Los Vaqueros de las Montanas (horse arena). Area undergoing residential development. (Hill, Kramer/UCR) Pvt	SBD

100729 (UCR)	U	1997	Above Lucerne Valley, Pleuss-Stauffer mining area. S of Crystal Creek, N of Fawnskin. Proposed as new waste dump. Scarce annual on open carbonate soil. Gently sloping alluvial soil of limestone and igneous material in patches. (White/UCR) SBNF	SBD
74506 (RSA)	U	1932	Along rd to fish hatchery, S of Baldwin Lk. (Peirson/ RSA) Ownership: U	SBD
*	+/-100	2003	Holcomb Valley, Meadowy areas around Wilber's Pond, and between Wilber's Pond and Forest Road 3N16. SBNF	SBD
*	U	2005	Arrastre Flat South of Forest Road 3N16, along road to Tanglewood Group Camp (3N79), with <i>Castilleja lasiorhynca</i> and <i>Phlox dolicantha</i> . SBNF	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Primary threats to *Phacelia exilis* on Forest System lands are hydrological impacts from ground-disturbing activities (especially during winter and spring when soils are wet), water diversions, fire suppression activities, fuels and vegetation treatments, roads and road maintenance, non-native species invasion, water development projects, vehicle use off designated roads, trampling from hikers, equestrians and mountain bikes, and other forest uses.

The main threat to *Phacelia exilis* occurrences off Forest System lands is extirpation and habitat loss from residential development

Conservation and Management Considerations

The short-term conservation strategy for *Phacelia exilis* is to develop a Habitat Management Guide and to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for this species:

- Prepare a Habitat Management Guide for vernal wetlands on the SBNF, including mesic swales, seeps and springs. This Guide should specifically address *Phacelia exilis* and associated mesic species including *Calochortus palmeri* var. *palmeri*, *Mimulus exiguus*, *Phacelia mohavensis*, *Castilleja lasiorhyncha*, and *Navarretia penninsularis* where they occur on the SBNF.
- Identify, describe, and map suitable habitat for *Phacelia exilis* on the SBNF and survey these areas during a normal or above-normal rainfall year for species occurrence.
- Survey all new occurrences of *Phacelia exilis* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Phacelia exilis* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Phacelia exilis* in the planning area using NRIS data collection standards, and incorporate these occurrences into the SBNF Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Phacelia exilis is a rare, narrowly-distributed species, known from multiple small isolated occurrences. None of these occurrences are fully protected from identified threats.

Based on the above analysis, *Phacelia exilis* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	C	A

Phacelia exilis is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Phacelia exilis* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

The primary ongoing threats to this species on NFS lands are road use and management, associated off-road use near watercourses, and water diversions.

The majority of ongoing and expected impacts to this species occur in Back Country and Developed

Area Interface zones. Under Alternatives 1, 2, 3, 4, and 4a this species would be at continued risk from ongoing impacts to its habitat at approximately current levels. Under Alternative 4, impacts associated with higher levels of expected recreational use would be minimized by expected increases in management control and monitoring. Under Alternative 4a, a reduced emphasis on increased recreation with a concomitant decreased emphasis in monitoring and management control balance to about the same outcome as under Alternative 4. Under Alternative 5 there would be increased threats as a result in an increase in Back Country across the range of the species, an expected increase in road and trail construction and use, and additional water diversions/extractions. Under Alternative 6 there would be decreased threats as a result of a decrease in Back Country across the range of the species, and no expected increase in road and trail construction. The Arrastre Research Natural Area proposed under Alternatives 2, 3, 4a and 6 would provide substantial protection for a portion of this species' range.

Preparation of a Habitat Management Guide to address this species would be expected to have a higher priority and happen sooner under Alternatives 2, 3, 4, and 6. The response time and effectiveness of impact identification and management would be expected to be higher under Alternatives 3 and 6. The Arrastre Flat proposed Research Natural Area under Alternatives 2, 3, 4a and 6 would provide a higher level of protection for a small portion of the species range.

Consideration of the Suitable Use restricting vehicle travel to designated Forest Transportation System roads and trails, along with Standards for roads, trails, recreation and ground disturbance activities factor into the outcomes. The Arrastre Research Natural Area, where applied, is key to these outcomes.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

The private lands of Big Bear Valley have been highly reduced and fragmented by residential and commercial development. The remaining fragments continue to be lost as continued development occurs. As development increases, the demand for water and new diversions/extractions also increases. The majority of the distribution of this taxon occurs on National Forest System lands on the SBNF. While it is presumed that this species continues to lose habitat to private land development, this loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF.

By maintaining the current distribution of *Phacelia exilis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Phacelia exilis* to suffer a decline in its overall distribution.

Literature Cited

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**Perideridia parishii ssp.
parishii**

Phacelia mohavensis

Phacelia mohavensis

Phacelia mohavensis A. Gray (Mojave phacelia)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3Q; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Phacelia mohavensis occurs in the San Gabriel and San Bernardino Mountains (Wilken et al. 1993). CalFlora (2002) reports occurrences from the southern Sierra Nevada and Mt. Pinos, although these may be better attributed to *P. exilis* (formerly *P. mohavensis* var. *exilis*).

Distribution in the Planning Area

On the Angeles National Forest, *Phacelia mohavensis* occurs along the Angeles Crest and on the north slope of the San Gabriel Mountains. It is reported from the San Bernardino National Forest from collections near Lake Arrowhead, Big Bear Lake, in the San Bernardino Mountains. In general, the eastern half of the Mountaintop District (SBNF), including Bear Valley and Holcomb Valley, more likely supports *P. exilis*, while *P. mohavensis* is generally located on the western half of the Mountaintop district from Deep Creek westward into the San Gabriel Mountains.

On the San Bernardino National Forest, 23 occurrences with a total estimate of 1,600 individual plants were mapped on June 5, 2001, by R. T. Hawke, botanical contractor for the USDA Forest Service. Plants were observed from ¼-mile west of the Holcomb Group Camp Crossing along the Pacific Crest Trail, west for 3 miles (Hawke pers comm.).

Taxonomy and Natural History

Phacelia mohavensis is a dicotyledon in the waterleaf family (Hydrophyllaceae). *Phacelia* is a large genus in California; the length of its calyx lobes and corolla shape generally distinguish *Phacelia*

mohavensis from other species of *Phacelia* (Wilken et al. 1993). *Phacelia mohavensis* can be difficult to distinguish from Transverse Range *Phacelia* (*P. exilis*), which occurs primarily in the Big Bear area and the Sierra Nevada (California Native Plant Society 2001). *Phacelia mohavensis* has a yellow throat and purple filaments, whereas *Phacelia exilis* has a white throat and white filaments (Wilken et al. 1993). *Phacelia mohavensis* is an annual herb that blooms April - August (California Native Plant Society 2001). Because *Phacelia mohavensis* is an annual, high variation in populations is expected, resulting from climatic conditions.

Phacelia mohavensis is a 5-25 cm annual. The stems are erect, 0-few branched, glandular-puberulent, and short-stiff-hairy. The leaves are 10-45 mm. The leaf blades are linear to narrowly oblanceolate, entire, and tapered to the petiole. The pedicel is 2-5 mm. The calyx lobes are 3-5 mm, 5-10(15) mm in fruit, unequal, linear to oblanceolate, puberulent to short-hairy, and glandular. The corolla is 5-8 mm, bell-shaped, with a generally yellowish tube base and white limb, ages pale blue, is deciduous, and has lanceolate scales. The stamens are 5-14 mm, unequal, and more or less glabrous. The style is 5-8 mm and short-hairy. Fruit are 3-5 mm, ovoid, and puberulent. There are less than 10 seeds, which are 1-1.7 mm and with 8-11 cross-furrows (Wilken et al. 1993).

Habitat Description

Phacelia mohavensis grows on moist sandy or gravelly soils in pinyon-juniper woodlands, seasonal or ephemeral streambeds, and meadows at elevations of 4,600–8,200 feet (1,400–2,500 meters). It also is found in cismontane woodlands and lower montane conifer forests (California Native Plant Society 2001, USDA Forest Service 2002). Occurrences in the San Bernardino National Forest were located in granitic swales and ephemeral drainages with the following other rare species: *Lilium humboldtii* ssp. *ocellatum*, *Packeria bernardina*, *Castilleja lasiorhyncha*, *Calochortus palmeri* var. *palmeri*, and *Astragalus leucolobus* (USDA Forest Service 2003). Several occurrences on the San Bernardino National Forest were observed in 2001 in areas burned with low intensity in the September 1999 Willow Fire.

Occurrence Status

CalFlora (2002) reports several occurrences of *Phacelia mohavensis*. In addition to these occurrences, *Phacelia mohavensis* has been documented from several areas on the San Bernardino National Forest, including localities north of Lake Arrowhead (Krantz et.al. draft 2000).

The table shows the recorded occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences

OCCURRENCE DATA – *Phacelia mohavensis* (Mojave phacelia)

Occurrence No.	No. of Plants	Year Reported	Location/Land Owner	County
CalFlora 1367389	U	1892	Seeley's Flat, San Bernardino Mountains. Land owner: U.	SBD
CalFlora 1256629, 1216071	U	1953	1.7 mi. W of upper Kinley Creek, along Hwy 173, JCT of Van Dusen Cyn Rd. from Baldwin Lake to Holcomb Valley. SBNF?	SBD
CalFlora 1323431	U	1969	3.2 mi. WSW Cloudburst Summit SE-facing slope along Angeles Crest Hwy. ANF.	LA
CalFlora 1323416	U	1969	Upper Chilao Campground; bottom of shallow arroyo. San Gabriel Mtns. ANF.	LA
CalFlora 1323428	U	1971	1.8 mi. below Alder Saddle sandy creek bank. In Pinyon Flats area. San Gabriel Mtns. ANF.	LA
CalFlora 1241747, 1241746	U	1976	At entrance to Hidden Valley Scout Camp along FR 3N17; just N of Bandito Campground, 2 mi. W of Route 2. San Gabriel Mtns. Land owner: U.	LA
CalFlora 1344782	U	1990	Jackson Lake northerly draw draining to San Gabriel Mtns, Mescal Creek. Land owner: U.	LA
CalFlora 1342890 85820 (UCR)	U	1991	G.M. ridge NNE Granite Mountain vicinity, Pacifico Mountain. Land owner: U. // T3N/R11W/S6/SW ¼ of NE ¼ (Ross/UCR)	LA

CalFlora 1821309, 1401402	U	1933	Sulphur Springs, San Gabriel Mtns. Land owner: U.	LA
CalFlora 1359171	U	1905	E base Mt. Pinos. Land owner: U. (<i>P. exilis?</i>)	Ventura
*	300	2001	ORV Road 1W17, 1.3 km from FR 3N34, ca. ¾ mi. NNE of Crab Flats Campground. Small dry streambed, sandy granitic origin. Open yellow pine/black oak/canyon oak forest w/ <i>Bloomeria crocea</i> , <i>Poa</i> sp., <i>Scutellaria</i> sp. Within 1999 Willow Fire. SBNF.	SBD
*	425	2001	ORV Trail 1W17, halfway between trailhead and Pacific Crest Trail. Dry flat streambeds within yellow pine/canyon oak forest. w/ <i>Leymus</i> sp., <i>Potentilla</i> sp., <i>Trifolium</i> sp., <i>Scutellaria</i> sp., <i>Bloomeria crocea</i> , <i>Calochortus palmeri</i> var. <i>palmeri</i> , <i>Castilleja lasiorhyncha</i> . Within 1999 Willow Fire and in area with <i>Bromus tectorum</i> . Population in disjunct groups all in headwater branches of an unnamed stream. SBNF.	SBD
*	150	2001	ORV Trail 1W17 with streambed crossing. N of Crab Flats. Flat dry streambed within yellow pine/canyon oak forest. Streambed with probable high water table. w/ <i>Leymus</i> , <i>Trifolium</i> , <i>Scutellaria</i> , <i>Bloomeria crocea</i> , <i>Achillea millefolium</i> , <i>Calochortus palmeri</i> var. <i>palmeri</i> , <i>Castilleja lasiorhyncha</i> . Habitat probably exists from this point both upstream and downstream for all three rare species. In 1999 Willow	SBD

			Fire area. SBNF.	
*	100	2001	ORV Trail 1W17, 520 m from trail junction at Crab Flats Rd. (3N34). Creek on W side of trail and parallel to it. Flat dry streambed w/ in yellow pine/canyon oak open forest. Streambed 3-4 ft. wide, sandy from granitic source. Plants prefer center of channel where there is little vegetation. w/ <i>Bromus tectorum</i> , <i>Poa</i> sp., <i>Trifolium</i> sp. 1999 Willow Fire area. SBNF.	SBD
*	630	2001	FR 3N16 (Crab Flats Rd.), 0.3 mi. from road jct w/ 3N34. Plants located on NW side of FR 3N16. Plants located in flat areas along dry stream corridor and all of its headwater branches w/in yellow pine/black oak/canyon oak forest. w/ <i>Leymus</i> , <i>Scutellaria</i> , <i>Trifolium</i> , <i>Horkelia</i> , <i>Bloomeria crocea</i> , <i>Bromus tectorum</i> , <i>Calochortus palmeri</i> var. <i>palmeri</i> , <i>Castilleja lasiorhyncha</i> . In 1999 Willow Fire area. SBNF.	SBD
RSA 1872	U	1995	San Gabriel Mountains: Head of Little Rock Creek ca. ½ mile downstream from Alder Saddle.. Elev. 4950 Feet.	LA
RSA 3512	U	1933	Sulphur Spring, San Gabriel Mts. Elevation 5000 feet.	LA
RSA 1592	U	1917	San Antonio Mountains, San Antonio Canyon. Alt. 7500 ft.	LA

RSA 15494	U	1932	Above Manker Flats on N slope, just beyond saddle near Sierra Club cabin	LA
RSA 2824	U	1907	West Pine Flats	LA
RSA 962	U	1921	trail from Pine flats to Chilao	LA
RSA 3154	U	1922	Mescal Creek, Swarthout Valley region, westward from Big Pines	LA
RSA 3464	U	1990	San Gabriel Mountains: Camp Verdugo Pines and vicinity; northerly draw draining to Jackson Lake. Mescal Creek USGS 7.5' quad, T4N R8W, NW/4 SW/4 section 33, elevation 6160-6280 feet.	LA
RSA 3807	U	1990	ridgetop to the SW of Crystal Lake (ridge descending SSW from Mt. Islip): Crystal Lake USGS 7.5' Quad.; T3N R9W, E/2 SE/4 section 30 and NW/4 NW/4 SW/4 section 29; elevation ca. 5840-6120 feet.	LA
RSA 5853	U	1991	Horse Flats, San Gabriel Mountains: Chilao Flat USGS 7.5' quad, T3N R11W, SW/4 SW/4 SW/4 section 14, at 5620 feet elevation.	LA
RSA 38307	U	1969	San Gabriel Mountains, Angeles National Forest: Angeles Crest Highway, 3.2 mi WSW of Cloudburst summit; elevation ca. 6500 feet.	LA

RSA 38281	U	1969	San Gabriel Mountains, Angeles National Forest: near Chilao Creek, Upper Chilao Campground, elev. C. 5300 ft.	LA
RSA 41267	U	1971	San Gabriel Mountains, Angeles National Forest: Lily Spring on NW slope of Mt. Hawkins	LA
RSA 40829	U	1971	San Gabriel Mountains, Angeles National Forest: S fork of Little Rock Creek, 1.8 miles below Alder Saddle in Pinyon Flats area; elev. Ca. 5100 ft.	LA
RSA 44746	U	1974	Lily Springs area on N slope of Mt. Hawkins, drainage of S Fork Big rock Creek; elevation ca. 8000 ft. ANF.	LA
RSA 4188 102187(UCR)	U	1995	Big Horn Peak (W of Cucamonga Peak) // T2N/R7W/S27/ SE ¼ of NE ¼ (Swinney/UCR)	SBD
*	1	2004	Near Squint's Ranch at end of FS road 3N38 A spur, near road, SBNF. Area burned in 2003 Old Fire. (Hawke)	SBD
*	85	2004	Between FS roads 2N29Y and Squint Ranch road (3N34), north of Rouse Ranch road (2N25), SBNF. Area burned in 2003 Old Fire. (Hawke)	SBD
*	5	2004	Near Rouse Meadow, eastern side of 2N25Y. Area burned in 2003 Old Fire. (Hawke)	SBD

603245 (RSA)	U	1941	San Bernardino Mts., Green Valley, Bear Valley. (Woglum/RSA)	SBD
338395 (RSA)	U	1980	San Bernardino Mts., near Mojave River, S of Hesperia and 5.2 mi.N of jct. Of Silverwood Lake and Hesperia roads, elev. 3200 ft. (Thorne/RSA)	SBD
6897 (RSA)	U	1919	San Bernardino Mts., Hunsaker Flats, wet meadow elev. 5200 ft. (Munz/RSA)	SBD
42801 (RSA)	U	1982	San Bernardino Mts., near the jct. Of Hwy 38 & Holcomb Valley Rd., immediately N of Baldwin Lake, elev. ca. 6000 ft. (Gustafson/ RSA)	SBD
1821308 CalFlora)	U	1986	San Bernardino Mts., upper Kinley Creek, along Hwy 173 (dirt) N of Lake Arrowhead, 0.6 mi. N of the Willow Creek Jeep Trail; seep and damp wash in opening in brushy woods. T3N/R3W/S33 /NW ¼ (Sanders/CalFlora)	SBD
1821311 (CalFlora)	U	1967	San Bernardino Mts., on Rebel Ridge at Big Bear Lake (Myrick/ CalFlora)	SBD
UCSC1208 (SMASCH)	U	1948	San Bernardino Mts., Pine Knot campground, Big Bear Lake, flats occasionally forming colorful spreads, arid transition zone, above Pine Knot campground, S. shore of Big Bear Lake, elev. 6700 ft. (Kamb/CalFlora)	SBD

UCR44842 (SMASCH)	U	1986	San Bernardino Mts., 1.9 mi. E of Deer Lick Ranger Station on the Rd. to Keller Peak. Elev. 2134m (Vasek/CalFlora).	SBD
UCR62360 (SMASCH)	U	1990	San Bernardino Mts., N side of Holcomb Valley, N of Bellville Flat N of USFS 3N07, 1.2 mi. from Holcomb Valley Rd. (USFS 3N16) (Morgan/CalFlora)	SBD
UCR62361 (SMASCH)	U	1990	San Bernardino Mts., W of Holcomb Valley. Big Pine Flat Rd. (USFS 3N06), 0.1 mi. E of 3N07 and 0.1 mi. W of 3N05 (Morgan/CalFlora)	SBD
UCR128589 (SMASCH)	U	1992	San Bernardino Mts., mouth of Burns Cyn., 0.5 mi. W of end of pavement near Rimrock, elev. 1433-1463m, Lat:34.1847222/Lon:-116.5669444, T01N/R04E/S04, Joshua Tree-Pinyon woodland transition. (Sanders/CalFlora)	SBD
UCR74763 (SMASCH)	U	1992	San Bernardino Mts., E. of Running Springs, swale 600 ft. E of bridge on Keller Peak Rd., ca. ¼ mi. E of Hwy 330, elev. 1829m T01N/R02W/S04 (Hirshberg/CalFlora)	SBD
UCR72297 (SMASCH)	U	1992	San Bernardino Mts., vicinity of Rock Camp Ranger Station, from the station to ca. 1 mi. due E, and at widest part of site, S to Hwy 173, elev. 1494m, Lat:34.2841666/Lon:-117.200833, T02N/R03W/S04 (White/CalFlora)	SBD

74641 (UCR)	U	1992	San Bernardino Mts. E of Arrowbear Lake, at intersection of Keller Pk. Rd. with FS Rd. 1N96C (jeep trail)/ T2N/R2W/S35 (Hirshberg/UCR)	SBD
83648 (UCR)	U	1994	Kinley Creek, above the Hwy 173 bridge, toward pinnacles, T3N/R3W/S28 (Sanders/UCR)	SBD
101979 (UCR)	U	1993	Upper Lytle Creek, 1.6 mi. N of the intersection of FS Rd. 3NO6 and 3N33, ca 400 m W of campground/ T3N/R7W/S34/North Center 1/4	SBD
98592 (UCR)	U	1993	San Sevaine Flats, ca. 200 m. W of jct. Of FS rds. 1N34D and 1N34/ T2N/6W/S34/ SW ¼ (Swinney/UCR)	SBD
139599 (UCR)	U	2004	Little Bear Creek, ca 1.5 mi. ENE of Lake Arrowhead, above confluence with Hooks Creek/ T2N/R3W/S12 (Sanders/UCR)	SBD
*	90	2004	W of 3N34, N of 2N25, E. of Ash Meadows, S of 3N38, Section 1 (Hawke, R.T.)	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*
- *LA = Los Angeles County*

Threats

Primary threats to *Phacelia mohavensis* on Forest System lands are hydrological impacts from ground-disturbing activities (especially during winter and spring when soils are wet), water diversions, fire

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- Identify, describe, and map suitable habitat for *Phacelia mohavensis* on the SBNF and survey these areas during a normal or above-normal rainfall year for species occurrence.
- Survey all new occurrences of *Phacelia mohavensis* and any occurrences that have not been visited in the past five years and record occurrence status, habitat condition, and threats.
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- Map known and new occurrences of *Phacelia mohavensis* in the area using NRIS data collection standards, and incorporate these occurrences into the SBNF Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Phacelia mohavensis is a rare, narrowly-distributed species, known from multiple small isolated occurrences. None of these occurrences are fully protected from identified threats.

Based on the above analysis, *Phacelia mohavensis* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	C	A

Phacelia mohavensis is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Phacelia mohavensis* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

The majority of ongoing and expected impacts to this species occur in Backcountry Motorized (BCM) and Urban and Rural Interface (URI) zones. Under Alternatives 1, 2, 3, and 4, this species would be at continued risk from ongoing impacts to its habitat at approximately current levels. Under Alternative 4, impacts associated with higher levels of expected recreational use would be minimized by expected increases in management control and monitoring. Alternative 4A is associated with slower growth in recreation use and more non-motorized zoning than Alternative 4. Under Alternative 5 there would be increased threats and an increase in BC across the range of the species, an expected increase in road and trail construction and use, and additional water diversions/extractions. Under Alternative 6 there would be decreased threats as a result of a decrease in BCM across the range of the species, and no expected increase in road and trail construction. The Deep Creek Wild and Scenic River shown as eligible under all alternatives, if designated, would provide substantial protection for this species. The Deep Creek proposed wilderness under Alternative 3 would provide optimal conservation for an important portion of this species range.

Preparation of a Habitat Management Guide to address this species would be expected to have a higher priority and happen sooner under Alternatives 2, 3, 4, and 6. The response time and effectiveness of impact identification and management would be expected to be higher under Alternatives 3 and 6.

Consideration of the Suitable Use restricting vehicle travel to designated Forest Transportation System roads and trails, along with Standards associated with riparian areas, recreation and access factor into the outcomes.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

The private lands near Lake Arrowhead have been highly reduced and fragmented by residential and

commercial development. The remaining fragments continue to be lost as continued development occurs. As development increases, the demand for water and new diversions/extractions also increases. The majority of the distribution of this taxon occurs on National Forest System lands on the SBNF and ANF. While it is presumed that this species continues to lose habitat to private land development, this loss is not expected to reduce the viability of the protected and managed occurrences on the SBNF.

By maintaining the current distribution of *Phacelia mohavensis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Phacelia mohavensis* to suffer a decline in its overall distribution.

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Phacelia exilis

Phacelia suaveolens ssp. keckii

Phacelia suaveolens ssp. keckii

Phacelia suaveolens E. Green var. *keckii* (Munz & I. M. Johnston) (Santiago Peak Phacelia)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4T1, S1.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B R-E-D Code 3-1-3

General Distribution

Phacelia suaveolens var. *keckii*, Santiago Peak Phacelia is found in the Santa Ana Mountains in Orange and Riverside Counties (Stephenson and Calcarone 1999; California Native Plant Society 2001). The California Natural Diversity Database lists occurrences near Santiago Peak, Modjeska Peak, and Pleasants Peak in the Santa Ana Mountains. The plant is also reported from Arroyo Seco Creek near Wild Horse Peak in the Agua Tibia Wilderness Area of the Cleveland National Forest in Riverside County (California Natural Diversity Database 2004).

Distribution in the Planning Area

All reported occurrences of *Phacelia suaveolens* var. *keckii* in the California Natural Diversity Database occur on the Cleveland National Forest and are moderately protected (California Natural Diversity Database 2004).

Taxonomy and Natural History

Phacelia suaveolens var. *keckii* (Hydrophyllaceae) is an annual herb that flowers from May–June (California Native Plant Society 2001). It is one of two varieties of *Phacelia suaveolens* that occur in California. *Phacelia suaveolens* var. *keckii* is restricted to southern California, while subspecies *Phacelia suaveolens* var. *suaveolens* has a more northerly distribution, a shorter corolla (7 to 11 mm), ovoid fruit, and more seeds (10 to 16) (Wilken, Halse, & Patterson 1993).

Phacelia suaveolens var. *keckii* has an ascending or erect stem (5 to 40 cm), which is simple to branched

at base, short to hairy, and glandular to puberulent. The leaf blade (10 to 75 mm) is generally longer than petiole, widely elliptic to ovate, with a toothed to slightly lobed margin. Flower pedicel 1 to 2 mm; calyx lobes are 4 to 5 mm and 6 to 8 mm in fruit, oblanceolate, short-hairy, and glandular. The yellow corolla tube is 10 to 14 mm and narrowly bell-shaped, with a limb that is lavender to purple, deciduous, with linear scales; and glabrous stamens 3 to 6 mm. The short, glandular-hairy style is 3 to 4 mm. Fruit is oblong, 3 to 5 mm with short hairs. Seeds are pitted, 1 to 1.5 mm, and 8 to 10 in number (Wilken, Halse, & Patterson 1993).

Populations reported from road margins, recent alluvium, and observed in greatest abundance following wildfire suggest that *Phacelia suaveolens* var. *keckii* may be adapted to some forms of disturbance (Stephenson and Calcarone 1999).

Habitat Description

Phacelia suaveolens var. *keckii* occurs on stream alluvium, volcanic soils, and other open sites within chaparral and Knobcone Pine stands and is seen in greatest abundance following fires (Stephenson and Calcarone 1999). Populations are reported at elevations of 1,800-5,000 feet (545-1,600 meters) (California Native Plant Society 2001, California Natural Diversity Database 2004).

Occurrence Status

There are four recorded occurrences for *Phacelia suaveolens* var. *keckii* on National Forest System lands; all occur on the Cleveland National Forest. *Phacelia suaveolens* var. *keckii* is recorded at Pleasants and Modjeska peaks. There are no records right at Santiago Peak but there is a reported location along the Coldwater Trail about 1/2 mile east of the peak. Forest botanists have not observed any of these populations as they seem to appear only after fire and are difficult to locate in intervals between fires (Winter, pers. comm.).

The following table represents occurrences recorded for *Phacelia suaveolens* var. *keckii*.

OCCURRENCE DATA of *Phacelia suaveolens* var. *keckii* (Santiago Peak Phacelia) on National Forest lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
2	2-1	U	1981	Pleasants Peak / CNF	OR/ RIV
1	2-2	U	1923	Santiago Peak / CNF	OR

3	2-3	10	1988	Modjeska Peak / CNF	OR
4	*	U	1990	Arroyo Seco Creek / CNF	RIV
*	*	U	*	Santiago Peak, ½ mile east of peak along Coldwater Trail	OR

- U = Unknown.
- * = an occurrence number has not been assigned.
- CNF = Cleveland National Forest
- OR = Orange County
- RIV = Riverside County

Threats

There are currently electronic sites managed under special use permit at Santiago, Modjeska and Pleasants Peak. All of these sites are considered to be at "built out" with no room for additions. The electronic site at Santiago is approximately five acres. Facilities at Pleasants and Modjeska are modest, with just a few buildings and towers. Construction of all of the sites probably destroyed some habitat in the past; presently the suitable habitat seems to be on the slopes around the sites, and there are no plans at this time that would affect those areas unless the Forest authorized a large site expansion (Winter, pers. comm.). All of the CNF communication sites were just officially designated. The demand for electronic sites has been in decline due to an increase in the use of satellites and requests are now for cell phone towers along roads. There are no foreseeable new communication sites or site expansions within this planning period that would affect *Phacelia suaveolens* var. *keckii* (Winter pers comm.).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Phacelia suaveolens* var. *keckii*:

- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Survey areas in potential habitat following wildland or prescribed fires.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Monitor occurrences at Modjeska Peak and Santiago Canyon. Monitor during high recreation

periods or during Santiago Peak communication site maintenance periods along Forest Road 13S04 (North main Divide Road) near the occurrences.

- Allow wildland fires to freely burn through occurrences. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads.
- Avoid the use of Modjeska Peak and adjacent ridgelines for fuel break construction or as holding lines during wildfire suppression. The use of hand line for fuel break construction is preferred.
- Do not develop additional trails or other facilities near known occurrences.
- Avoid constructing pullouts or parking areas along Forest Road 13S04 (North Main Divide Road) near the occurrences.
- Avoid using or dumping fill material at the occurrence at Modjeska Peak during road maintenance along Forest Road 13S04 (North Main Divide Road).
- Use water tanks for dust abatement during road maintenance near occurrences along Forest Road 13S04 (North Main Divide Road).

Evaluation of Current Situation and Threats on National Forest Systems Lands

Phacelia suaveolens var. *kecki* is known from a few highly restricted occurrences but is not currently considered to be in danger of extinction (California Native Plant Society 2001). Occurrences are limited and population numbers are unknown.

Because this taxon is an annual and a fire follower, the number of plants visible during years between fires is not a reliable indicator of the vigor of the population (most of which will be in the seed bank). The relationship of *Phacelia suaveolens* var. *kecki* to forms of soil disturbance other than fire needs to be investigated to better understand the effects of management activities on this taxon. The occurrence at Arroyo Seco Creek within the Agua Tibia Wilderness has no known threats. Prescribed fire in old age stands of habitat for *Phacelia suaveolens* var. *kecki* could benefit the taxon. There is no indication that *Phacelia suaveolens* var. *kecki* is at substantial risk from Forest Service activities at this time.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Phacelia suaveolens var. *kecki* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the

alternatives would not result in a substantial change in conditions for this taxon. *Phacelia suaveolens* var. *kecki* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Phacelia suaveolens* var. *kecki* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Personal communication

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Phlox dolichantha

Phlox dolichantha A. Gray (Big Bear Valley Phlox)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Phlox dolichantha is endemic to the northeastern San Bernardino Mountains, in Big Bear and Holcomb valleys and adjacent areas, including White Mountain to the west, Crystal Creek to the north, Onyx Peak to the east, and Sugarloaf ridge along the south. The California Natural Diversity Database (2004) lists eighteen occurrences of *Phlox dolichantha*, and there are additional occurrences that have not yet been included in the database.

Distribution in the Planning Area

There are twenty reported occurrences of *Phlox dolichantha* on the San Bernardino National Forest; three of these were discovered within the past three years (California Natural Diversity Database 2004; USDA Forest Service 2002). Occurrence locations include Onyx Peak, Sugarloaf Ridge, Holcomb Valley, Gold Mountain, Bertha Ridge, and Hitchcock Meadow (Krantz, et.al. draft 2000).

Populations on the vicinity of the White Mountain on the north slope of the San Bernardino Mountains that could be considered *P. dolichantha* or *P. stansburyi* will be considered *P. dolichantha* pending results of the ongoing study (Patterson and Wilken 1993). This would include records southeast of the south peak of White Mountain collected by Volgarino in 2000 and may also include records from Crystal Creek collected by Munz in 1932, 3N16 by Big Pine Flat, collected by Morgan in 1990, and between the north and south peak of White Mountain collected by Soza in 2001. However, if these are *P. stansburyi*, then *P. dolichantha* is more restricted than currently treated.

Taxonomy and Natural History

Phlox dolichantha is a dicotyledon in the phlox family (Polemoniaceae) (Patterson and Wilken 1993). This species is a perennial herb that typically flowers May–July (California Native Plant Society 2001). However, some individuals have been observed flowering in October after heavy August thunderstorms and early fall rains (USDA Forest Service 2002).

Phlox dolichantha was originally lumped with *Phlox superba* (*Phlox stansburyi* ssp. *superba*), a closely-related species known from the eastern slopes of the Sierra Nevada, the White and Inyo Mountains, to Arizona, Nevada, and New Mexico. *Phlox dolichantha* is differentiated by its elongated corolla tube, underground stem characteristics, and habitat associations (Bennett 1979).

Phlox dolichantha is a perennial herb from slender, woody underground rootstocks. It is scarcely, if at all, suffrutescent. Stems are erect or ascending, 1-3 dm. high, branched, subglabrous to somewhat glandular-puberulent in upper parts. The internodes are mostly from 1/3 to as long as the leaves. The leaves are sessile, lance-linear, bright green, 2-4.5 cm long, 2-6 mm wide, and acute to acuminate. The lower leaves are nearly glabrous and the upper are glandular-pubescent. There are few flowers in (1-)3-12 flowered loose cymose clusters at the end of the branches. The pedicels are slender, 3-20 mm long and glandular. The calyx is 10-12 mm long, glandular-puberulent, and with subulate lobes about as long as the tube. The corolla is white or rose to pinkish-lavender, salverform, and has a tube 3.5-4.5 cm long, a 1.5-2 cm broad limb, and oblong-obovate lobes that are 8-10 mm long and subentire. The stamens are somewhat exerted, the style is filiform and 2.5-3 cm long, and the capsule is 5-8 mm long and 1-seeded (Munz 1974).

Habitat Description

Phlox dolichantha inhabits clay soils in pebble plains and openings in upper montane coniferous forest habitat at elevations of 6,000-9,750 feet (1,830-2,970 meters) (California Native Plant Society 2001). *Phlox dolichantha* grows scattered in patches, typically on north-facing slopes and in shaded canyons, under pines and black oak with deep pine litter (California Natural Diversity Database 2004; Bennett 1979). Associated species include *Pinus jeffreyi*, *Quercus kelloggii*, *Packeria bernardina*, *Ivesia argyrocoma*, *Eriophyllum lanatum* var. *obovatum*, *Chrysothamnus nauseosus*, and *Chaenactis santolinoides* (Bennett 1979).

Occurrence Status

Occurrences on National Forest System lands are relatively stable and are rarely extirpated due to disturbance. However, these occurrences are sometimes degraded from dispersed recreation activities. Part of occ. no. 9 was impacted from the construction of facilities at the Aspen Glen Picnic area. Some variation within occurrences resulting from varying climatic conditions has been noted. Occurrence no. 9 had 180 individuals in 1979 and increased to approximately 500 in 1995, probably in response to above-average precipitation (USDA Forest Service 2002).

New occurrences were also located within the Willow Fire burned area and showed some resilience to fire. An occurrence north of Big Pine Flat along Forest Road 3N11 burned with high intensity during the September 1999 Willow Fire. During post-fire monitoring, some burned plants were observed that did not survive. Several other plants had six inches of vegetative growth in one year, possibly following resprouting, but they may have regenerated from seed (USDA Forest Service 2002).

Some locations that co-occur with federally listed species on pebble plain habitat have benefitted over the last several years from actions completed in the Southern California Conservation Strategy. Habitat protection measures in these locations are expected to result in habitat improvement to *Phlox dolichantha* over the long term.

The trend for *Phlox dolichantha* on private lands is negative; part or all of several major occurrences have been lost to recent development in Big Bear Lake (including the Castle Glen development), Upper Moonridge, Sugarloaf, and Fox Farm; more significant occurrences in these same areas, and also in Fawnskin, are threatened by development over the next few years (USDA Forest Service 2002).

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Phlox dolichantha* (Big Bear Valley phlox)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1979	ca. 1.1 mi. from Onyx Peak. w/ <i>Arenaria ursina</i> , <i>Arabis parishii</i> , <i>Castilleja cinerea</i> , <i>Ivesia</i> <i>argyrocoma</i> . SBNF.	SBD
2	U	1979	Town of Sugarloaf, SE portion of town and vicinity. Surrounded by open forest of <i>Pinus jeffreyi</i> , <i>Calocedrus decurrens</i> , <i>Cercocarpus ledifolius</i> , <i>Amelanchier</i> . Also w/ <i>Astragalus</i> <i>leucolobus</i> , <i>Ivesia argyrocoma</i> , <i>Castilleja montigena</i> . Some areas have been developed. SBNF/PVT.	SBD

3	U	1982 2004	ca. 0.5 mi. E of Sugarloaf Mtn. summit, along pack trail. SBNF.	SBD	
4	U	1979	Wildhorse Rd., 0.25 mi. SSE of Green Canyon Group Camp, San Bernardino Mtns. SBNF.	SBD	
6	U	1978	N of Lightning Gulch, ca. 0.9 mi. ESE of Wildhorse Spring. w/ <i>Arenaria ursina</i> . SBNF.	SBD	
8	U	1978	Near proposed JCT of North Star and Evergreen Drives and of Heavenly Valley and Woodstock Rds. N-facing hillsides w/ litter and shade from Jeffrey pines. w/ <i>Arenaria ursina</i> , <i>Ivesia argyrocoma</i> , <i>Castilleja cinerea</i> . Proposed development. PVT.	SBD	
9		180 in 1979, 500 in 1995	1979	Aspen Glen Picnic Area, S of Big Bear Lake. N-facing slopes in litter from Jeffrey pines. w/ <i>Packera bernardina</i> . Two populations near picnic area and campground. Recreational facilities. SBNF.	SBD
10	U	1977	E side Red Ant Canyon, S of Big Bear Lake. Snow Forest Ski Area. Sparse population. (No data on population since ski area was proposed). SBNF.	SBD	
12	U	1979	S portion of Arrastre and Union Flat ca. 2 mi. N of Big Bear City. Incl. former occ. #13. SBNF.	SBD	

14	U	1984	Upper Holcomb Valley and NW end of Van Dusen Cyn. Wet meadow and pebble plains w/ several sensitive plant species. SBNF.	SBD
15	U	1979	NW slope of Bertha Peak and E slope of Delamar Mtn. Several collections from here. Incl. former occ. #18, 20. SBNF.	SBD
17	U	1984	Castle Glen Preserve, Big Bear Lake. Fenced, but private parcels unprotected. w/ 9 other sensitive plant spp. TNC/PVT.	SBD
19	U	1979	ca. 0.8 mi. W of Bertha Peak, San Bernardino Mtns. SBNF.	SBD
21	U	1978	ca. 0.2 mi. E of Onyx Peak, along FR 1N01. SBNF. Saragosa quartzite pavement. w/ <i>Arenaria ursina</i> , <i>Arabis parishii</i> , <i>Castilleja cinerea</i> , <i>Ivesia argyrocoma</i> . SBNF.	SBD
22	U	1932	Crystal Creek, Dry N slope, San Bernardino Mtns. At 7,000' along creek. SBNF. (Munz/UCR)	SBD
23	U	1949	Moonridge Ski Area, Bear Valley. Open areas under pines and firs at edge of meadow. SBNF.	SBD

24	U	1984	<p>From NE edge of Moonridge to Sugarloaf. Fencing along major entry point, but trespass/vandalism are problems. Relatively undisturbed pebble plain. 10 acre parcel designated as mitigation bank plus 6 acres to TNC in progress (in 1984). PVT/TNC.</p>	SBD
26	U	1989	<p>ca. 0.7 mi. N of Gold Mtn. summit, NW of Baldwin Lake. N-facing slope w/ open woodland of <i>Pinus jeffreyi</i>, <i>Pinus monophylla</i>, <i>Cercocarpus ledifolius</i> on granitic substrate. S of Holcomb Valley Rd. at crossing with Jacoby Canyon. Area used infrequently for camping. SBNF.</p>	SBD
*	120	2000	<p>Drainage NW of end of Travertine Rd., N of Moonridge. Jeffrey pine forest w/ <i>Cercocarpus ledifolius</i>, <i>Amelanchier utahensis</i>, <i>Juniperus occidentalis</i>, <i>Artemisia tridentata</i>, <i>Elymus elymoides</i>, <i>Poa secunda</i>, <i>Viola douglasii</i>, <i>Eriogonum wrightii</i>, <i>Collinsia parviflora</i>, <i>Achillea millefolium</i>. Semi-moist soil w/ pine needle duff. W slope 0-5%. No visible disturbance, but potential threat includes footpaths. SBNF.</p>	SBD

*	33	2001	Coldbrook Campground. Open area of montane conifer forest and adjacent to meadow w/ <i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i> , <i>Rosa woodsii</i> , <i>Achillea millefolium</i> , <i>Monardella linoides</i> . <i>Sidalcea pedata</i> in vicinity. Campground closed. Impacts incl. dispersed recreation and snowplay. Nearby equestrian and mountain biking. SBNF.	SBD
*	50	2001	Along Pacific Crest Trail ca. 1 mi. W of JCT of PCT/Van Dusen Cyn Rd. Plants are low-growing on both sides of trail. Growing beneath <i>Cercocarpus ledifolius</i> woodland immediately adjacent to trail. Dolomite soils w/ <i>Erigeron</i> sp., <i>Elymus elymoides</i> , <i>Cordylanthus rigidus</i> ssp. <i>setigerus</i> . Threats = hiking, equestrian use, and (unauthorized) mtn. bike use of trail. SBNF.	SBD
68506 (UCR)	U	1991	Big Bear Area, E. of Sugarloaf, and W. of Hwy. 38, S of 18 and Baldwin Lake, T2N, R2E, S19. (White/UCR)	SBD
17504 (UCR)	U	1979	1mi N of Baldwin Mine (Vasek/UCR)	SBD
*	U	1976	Big Bear Valley, Adjacent to parking lot at Aspen Glen Picnic grounds. Growing in partial shade of <i>Pinus Jeffreyi</i> and <i>Quercus kelloggii</i> on undisturbed forest floor (Derby/UCR)	SBD

15921 (UCR)	U	1979	North slope along 3N16, between County Dump (north of Baldwin Lake) and Arrastre Flat (Clark/UCR)	SBD
20217 (UCR)	U	1979	Onyx Peak, on N. aspect of Onyx Ridge at northern most bend of road to summit. To knowledge this is furthest SE for range of species (Krantz/UCR)	SBD
62535 (UCR)	U	1990	Approx. 175 yds. W of Van Dusen Canyon Rd, and 0.8 mi N of Hwy 38 in Big Bear City. Observed on NE facing slope. (Hacker/UCR)	SBD
23230 (UCR)	U	1981	0.5 mi W of Sawmill Canyon and .75 mi W of sugarloaf (Ciano/UCR)	SBD
20085 (UCR)	U	1979	Side yard of Riverside Ave., Sugarloaf. Common among the houses in town responding favorably to the recent disturbance at Krantz residence. Open <i>Quercus kelloggii</i> and <i>Pinus jeffreyi</i> overstory. (Krantz/UCR)	SBD
67090 (RSA)	U	1951	Summit of ridge between Bear Valley and Holcomb Valley, deep humus under pines (Grant/RSA)	SBD
337772 (RSA)	U	1979	Upper Holcomb Valley south of Holcomb Valley Campground (Thorne/RSA)	SBD

*	U	1968	1 mi S of Holcomb Valley Campground, granitic soil. (Wilken/UC/Jeps)	SBD
*	U	1948	South shore of Big Bear Lake, above Pine Knot Campground (Kamb/UC/Jeps)	SBD
*	U	2001	North slope of White Mountain, in between the north and south peak. Carbonate soils with <i>Oxytheca parishii</i> var. <i>goodmaniana</i> . Forest will assume is <i>P. dolichantha</i> until study completed. Soza/USFS/Willow Fire burn plots	SBD
62362 (UCR)	U	1990	West of Holcomb Valley, Big Pine Flat Road (forest road 3N16), gravelly sand on N facing slope in shade with <i>Pinus jeffreyi</i> , <i>Cercocarpus ledifolius</i> and <i>Artemisia tridentata</i> . Corolla tubes about 30 mm. Long approaching <i>P. superba</i> . (Morgan/UCR). Forest will assume is <i>P. dolichantha</i> until study completed. SBNF	SBD
*	> 1000	2000	San Bernardino National Forest. East side of Forest Road 3N11, approx 1 mile SE of White Mountain. Could be considered <i>P. dolichantha</i> or <i>P. stansburyi</i> , protecting as <i>P. dolichantha</i> . Area burned in 1999 Willow Fire. (Volgarino/USFS)	SBD

*	U	U	Grout Bay Picnic Area. Source of information is Brad Henderson. Occurrence said to be affected by recreational use; has not been relocated nor monitored in last 7 years. May or may not be extant in 2003.	SBD
*	U	2004	Approximately 1/3 mile west of Bow Meadow on northeast edge of Bear Mountain Ski Resort, SBNF. Large population, not fully mapped. Trails intersect and houses in vicinity. (VinZant, USFS).	SBD
*	50	2004	Approximately 1/4 mile east of chair 9 in Bear Mountain Ski Resort. On ridge line, north facing slope. Area bulldozed by resort same year. Occurrence likely destroyed. (VinZant, USFS)	SBD
*	U	2004	On northeast facing slope of ridgeline directly west of closed FS road 2N92. North of Wildhorse Spring, SBNF. Many plants scattered across slope. (VinZant, USFS).	SBD
*	U	2004	South of town of Sugarloaf and north of FS road 2N27, SBNF. Many individuals scattered in this area on clay soils. Trails intersect and houses in vicinity. (VinZant, USFS).	SBD

*	U	2004	Tanglewood Group camp. Found in most areas of camp, including trails. Impacted by campers. (VinZant, USFS).	SBD
41381 (RSA)	U	1947	San Bernardino Mts., near Santa Ana Divide, elev.8000 ft. (Howe/RSA)	SBD
364117 (RSA)	U	1976	San Bernardino Mts., Big Bear Lake Village near junction of Mill Creek Rd. and Tulip Lane. Elev. 6950 ft. (Thorne/RSA)	SBD
339797 (RSA)	U	1979	San Bernardino Mts. E. of Holcomb Valley; in drainage at W edge of Arrastre Flat; elev. 7490 ft. (Thorne/RSA)	SBD
805516 (CalFlora)	U	1989	San Bernardino Mts., Bear Valley region, in Jacoby Cyn. Along Holcomb Valley Rd. (the Rd. from Baldwin Lake to Arrastre Flat), SW ¼ S36, T3N/R1E. elev. 7300 ft. (Taylor/CalFlora)	SBD
1826266 (CalFlora)	U	1967	San Bernardino Mts., N side of Gold Hill above Big Bear Lake (Myrick/CalFlora)	SBD
144158 (UCR)	U	2001	Big Bear Valley, "Camp Pine Summit" at southern margin of residential areas, City of Big Bear Lake, S. of Comstock Ave. and W of Thrush Dr./ T2N/R1E/S20 (LaHaye/UCR)	SBD

144130 (UCR)	U	2003	Onyx Summit area, near “Heartbreak Ridge”, unimproved routes accessed via Pipes Rd. (1N01) ca 1 mi. N of jct. With Hwy 38 at Onyx Summit/ T2N/ R3E/S31 (White/UCR)	SBD
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- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *TNC = The Nature Conservancy*
- *SBD = San Bernardino County*

Threats

Vehicle use off classified roads, ski area development, high levels of recreation use, and fuelwood harvesting adversely affect *Phlox dolichantha* on National Forest System land (USDA Forest Service 2002; California Natural Diversity Database 2004). *Phlox dolichantha* is highly susceptible to trampling in areas with intense recreational use because it is a brittle plant. Trampling and vandalism still threaten occurrences at Sugarloaf despite installed fences (California Natural Diversity Database 2004). Plants are affected by vehicle use off classified roads, especially when soils are wet; this activity is a major source of habitat degradation (Biotech 1983).

Fuelwood harvesting is a secondary threat to *Phlox dolichantha*. Although a temporary reduction in suitable habitat can be expected from timber and green fuel removal, *Phlox dolichantha* may benefit in the long term. Biotech (1983) suggests that brush clearance and limited timber harvest do not appear to adversely affect habitat; plants have been observed sprouting from areas used for landings and storage of slash. Fuels treatments with the Wildland Urban Interface defense zones within occupied habitat have begun on NFS lands in the Big Bear area. Occurrences are avoided where possible but some locations receive some level of disturbance to, however not anywhere near to the extent that occurrences are in danger of being extirpated (Eliason pers. comm.) The effects of burned hazard tree removal along Forest Road 3N11 within the Willow Fire area remain unknown.

Phlox dolichantha occurrences on private land are threatened by increasing urbanization in the region (California Native Plant Society 2001, Hickman 1993).

Conservation and Management Considerations

If destruction of the habitat is unavoidable, transplanting individuals should be considered as a last resort. At a transplant site in Moonridge, there was a 50% success rate one year after transplanting (Biotech 1983), although it remains unknown if these plants survived subsequent years.

The following list of conservation practices should be considered for *Phlox dolichantha*:

- Implement conservation measures in the Pebble Plain Habitat Management Guide.
- Revisit occurrence no. 10 to assess the occurrence status, habitat conditions, and current threats.
- Survey all new occurrences of *Phlox dolichantha* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Phlox dolichantha* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Phlox dolichantha* in the planning area using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.
- Collect material from locations listed in table above documented by Soza, Morgan, Munz and Volgarino on carbonate soils and finalize identification.

Evaluation of Current Situation and Threats on National Forest System Lands

Phlox dolichantha is endemic to the northeastern San Bernardino Mountains, in Big Bear and Holcomb valleys and adjacent areas, including White Mountain to the west, Crystal Creek to the north, Onyx Peak to the east, and Sugarloaf ridge along the south. Unauthorized off road driving, ski area development, effects from high levels of recreation use, falling of burned hazard trees along forest system roads, fuelwood harvesting and fuel treatments within the Wildland Urban Interface defense zone adversely affect *Phlox dolichantha* on National Forest System lands.

Based on these threats, *Phlox dolichantha* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	A	A	B	B	C	A

Phlox dolichantha is a USDA Region 5 Forest Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The management of this species where it occurs on pebble plain and to a lesser extent on carbonate habitat is tied to the implementation of the Pebble Plain Habitat Management Guide and the Carbonate Habitat Management Strategy. Existing protection of this habitat for the benefit of the associated federally threatened and endangered species provides considerable baseline protection. Populations that occur off pebble plain and carbonate habitat will most likely be subjected to a higher level of effects; however plants appear to withstand some level of disturbance. Consideration of the Suitable Use restricting vehicle travel to designated Forest Transportation system roads and trails, along with the full range of standards associated with rare species management, vehicular access and recreation factor into the outcome. The Arrastre RNA, Wildhorse RNA and Critical Biological land use zones are critical to the outcomes as is the presumed implementation of the Pebble Plain Habitat Management Guide and the Carbonate Habitat Management Strategy.

Under all Alternatives, numerous populations would continue to be managed within the existing Baldwin Lake/Holcomb Valley Special Interest Area established for the rare biological resources. In alternatives 2-6 protection would be increased with in the SIA due to Standard S33.

Under Alternative 1, pebble plains in general, and *Phlox dolichantha* in particular, would continue to be at risk from unauthorized vehicle travel off Forest Transportation System roads and trails.

Under Alternative 2, the proposed Arrastre Flat RNA, the Wildhorse RNA, the Sugarloaf proposed Wilderness and the Gold Mountain CBZ and BCNM zoning at lower Sugarloaf would provide substantial protection for this species.

Under Alternative 3, the Union and Gold Mountain CB zones, Arrastre RNA, Wildhorse RNA and proposed Sugarloaf Wilderness would provide protection for this species.

Under alternative 4, the full area designation of the proposed Sugarloaf Wilderness would increase protection for this species above the Wilderness designation in Alternatives 2 and 3, however important designations associated with both RNA designations and the Union and Gold Mountain CB zones would not occur.

Under 4a, The Gold Mountain CB zone, the Arrastre RNA, the Wildhorse RNA, would provide increased protection for this taxon. BCMUR zoning on the north slope of Sugarloaf would provide lesser protection than alternatives 1, 3, 4, and 6 in this location.

Under Alternative 5, land use zoning would not provide any protection for this taxon, nor would any special designations be recommended.

Under Alternative 6, BCNM zoning across the range of the species along with the Arrastre RNA, Wildhorse RNA and the Union and Gold Mountain CB zone and Sugarloaf proposed wilderness would provide substantial protection.

Viability Outcomes for All Lands Within Range of Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	C	D	B

The habitat for *Phlox dolichantha* on private lands in Big Bear Valley has been reduced by residential and commercial development. The remaining fragments of habitat for this species on private land continue to be lost as development occurs, especially in the Moonridge area. By maintaining the current distribution of *Phlox dolichantha* on National Forest System lands under Alternatives 1-4a, and 6, only alternative 5 would be expected to contribute substantial adverse cumulative effects that would cause this species to suffer a decline in its overall distribution. This would be due to the large number of occurrences on NFS lands and the extent of motorized land use zones within occupied habitats and the lack of any new Special Area designation recommendations. In addition, the potential for increased effects due to increased road and motorized trail construction and maintenance and associated authorized and unauthorized motorized uses contribute to this outcome.

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Phacelia suaveolens ssp. keckii

Physaria kingii ssp. bernardina

Physaria kingii ssp. bernardina

Physaria kingii (S.Watson) O’Kane & Al-Shehbaz ssp. *bernardina* (Munz) O’Kane and Al-Shehbaz
(San Bernardino Mountains bladderpod)

Management Status

Federal: Endangered; Critical Habitat designated December 24, 2002 (67 FR 78569).

California: None

Heritage Rank: G5T1; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

Critical Habitat (CH) for *Physaria kingii* ssp. *bernardina* was designated by the USFWS on December 24, 2002 (67 Federal Register 78569) (U.S. Fish and Wildlife Service 2002). In determining which areas to designate as CH the USFWS considers those physical and biological features that are essential to the conservation of the species and that may require special management considerations or protection. These features are termed Primary Constituent Elements (PCEs) and they are summarized in the final rule (U.S. Fish and Wildlife Service. 2002).

General Distribution

Physaria kingii ssp. *bernardina* is endemic to carbonate habitat in the Big Bear Valley area in the San Bernardino Mountains of San Bernardino County. *Physaria kingii* ssp. *bernardina* occupies the smallest area of the five federally listed carbonate endemic taxa (U.S. Fish and Wildlife Service 1997).

Distribution in the Planning Area

Several occurrences are on National Forest System lands on the Mountaintop Ranger District of the San Bernardino National Forest. Occurrences of *Physaria kingii* ssp. *bernardina* are known from two general areas. One area is located on the northern side of the valley, on and near the eastern end of Bertha Ridge and next to the community of Big Bear City. The other area is centered on Sugarlump Peak along Sugarloaf Ridge, south of Big Bear Valley and about five miles south of the Bertha Ridge populations. Occurrence no. 3 is reported from a historical specimen collected in 1924 at a location west of Cougar Crest. Big Bear Lake was constructed 12 years prior to the collection, and the reported elevation would

indicate that the occurrence is beneath the lake surface (California Natural Diversity Database 2004). This occurrence has not been relocated, despite many attempts, and may be erroneous or extirpated. However, there is a large area of suitable habitat for the species in the general area west of Cougar Crest, well above the reported elevation.

Taxonomy and Natural History

See Jepson Flora Project (2005) for information regarding the name change from *Lesquerella kingii* ssp. *bernardina* to *Physaria kingii* ssp. *bernardina*.

Physaria kingii ssp. *bernardina* is a dicotyledon in the mustard family (Brassicaceae). This perennial herb blooms between May–June (California Native Plant Society 2001). *Physaria kingii* ssp. *bernardina* is distinguished from other *Physaria kingii* subspecies by floral and fruit characters and by its geographic range. *P. kingii* ssp. *latifolia* is also found in San Bernardino County but occurs in the desert mountains of the eastern Mojave Desert and the Inyo and White Mountains, ranging east to Utah. The fruits have shorter styles and more seeds per chamber. *P. kingii* ssp. *kingii*, which occurs in the White Mountains, Sweetwater Mountains, and mountains of western Nevada, has shorter petals. *P. kingii* ssp. *diversifolia* occurs in Oregon and differs in fruit characters (Rollins 1993).

Physaria kingii is a caudexed perennial with dense, 5-7-rayed hairs. There are few-many stems. The cauline leaves are 0.5-2 cm that are elliptic to obovate. The flower petals are 5.5-13 mm. Fruit are 3.5-9 mm. *Physaria kingii* ssp. *bernardina* is distinguished by the following characteristics. *Physaria kingii* ssp. *bernardina* is an erect, often purplish plant. The leaves are wavy-margined to shallowly dentate. The outer basal leaves are diamond-shaped to round. The inner leaves are elliptic. Fruit are more or less round and short-stalked above the receptacle. The valve hairs are spreading outside and generally absent inside. The septum may or may not be entire. The style is 6-9 mm and slender. There are 2-4 seeds per chamber (Rollins 1993).

Habitat Description

Habitat for *Physaria kingii* ssp. *bernardina* is characterized by dolomite-derived soils. *Physaria kingii* ssp. *bernardina* inhabits brown, sandy soils with white to gray carbonate rocks or outcrops of large carbonate rock, in open areas with little accumulation of organic material. This taxon typically occurs on well-drained mountain sideslopes rather than flat alluvial areas. *Physaria kingii* ssp. *bernardina* is associated with Jeffrey pine-western juniper woodland, white fir forest, and subalpine forest dominated by limber pine (*Pinus flexilis*) and lodgepole pine (*P. contorta* ssp. *murrayana*). It occurs on gentle to moderate slopes at elevations of 6,800–8,800 ft (2,100–2,700 m) (U.S. Fish and Wildlife Service 1994).

Associated species include *Pinus monophylla*, *Juniperus occidentalis*, *Cercocarpus ledifolius*, *Chrysothamnus nauseosus*, *Artemisia tridentata*, *Streptanthus bernardinus*, *Astragalus leucolobus*, *Eriogonum kennedyi*, and *Linanthus pungens* (USDA Forest Service 2003). A survey of *Physaria kingii* ssp. *bernardina* revealed that plants occurring on the north-facing slopes were smaller, more scattered,

bloomed approximately one month later, and were less productive than plants on south-facing slopes (Wilson and Bennett 1980).

Occurrence Status

Physaria kingii ssp. *bernardina* is distributed in a few highly restricted occurrences and is considered to be in danger of extinction throughout its range (California Native Plant Society 2001). The population along the east side of Bertha Ridge (occ. no. 1) appears to be declining, possibly due to prolonged drought conditions. The total number of individuals in the six subpopulations at this location was estimated to be 25,000 in 1980 and less than 10,000 in 1988. The decline may reflect real change brought on by prolonged drought conditions and/or apparent change due to differences in sampling technique (U.S. Fish and Wildlife Service 1997). The habitat along the southern boundary of the Bertha Ridge occurrence has been and continues to be impacted by residential development and vehicle use off classified roads (California Natural Diversity Database 2004).

The occurrence in the Sugarlump area (occ. no. 4) contained approximately 10,000 plants in 1991. Resource personnel from the San Bernardino National Forest and California Department of Fish and Game observed increased abundance in the years following the drought (U.S. Fish and Wildlife Service 1997).

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences. For more thorough and precise distribution, refer to the GIS data maintained by the Mountaintop District, SBNF.

OCCURRENCE DATA – *Physaria kingii* ssp. *bernardina* (San Bernardino Mountains bladderpod)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	~25,000 in 1980; 5000-9000 in 1988	1989	E end of Big Bear Lake from Van Dusen Canyon to Bertha Ridge and S toward lakeshore. Six large subpopulations. In carbonate rock associated with <i>Pinus monophylla</i> , <i>Juniperus occidentalis</i> . Threatened by mining, ORVs, and development. Also near shooting range and Lakeview tract. Some plants already extirpated at southwest and southeast ends of occurrence. SBNF/PVT.	SBD

2	~1400 in 1980; ~350 in 1988	1988	Bertha Ridge, ca. 0.8 airmi. E of Bertha Peak, Big Bear Lake. In soil w/ large carbonate rocks. Assoc. w/ <i>Pinus monophylla</i> , <i>Juniperus occidentalis</i> , <i>Pinus flexilis</i> . 7600-7800 ft. Plants less dense here than at lower elevations. SBNF.	SBD
3	0 in 1980, 1988	1988	N side of Big Bear Lake, 2 mi. E of Fawnskin. Locally common under pines in 1924. Source elev. of 6700 ft. is now underwater. Barrows (1988) wonders if herbarium label for Johnson specimen is in error. Land owner: U.	SBD
4	U ~10,000	1990 2004	Sugarlump area, on ridge outside of ski area, S of Moonridge. From Sugarlump to unnamed 8745 ft peak. On north facing, dolomite scree/talus fields. Occurrences threatened by trail (2E18.3) (VinZant/ USFS) SBNF.	SBD
*	~15,000 to 20,000	2004	Bear Mountain Ski Resort: Scattered on ridgeline from unnamed 8564 ft peak to Sugarlump (in Geronimo Ski Run). Threatened by OHV's, recreation activities, and weed infestations.SBNF. (VinZant/ USFS)	SBD
22418 (UCR)	U	1980	Ridge 1 mi. N of Hwy 18 and 0.25 mi. N of rifle range at E. end of Big Bear Lake (Bennett/ UCR)	SBD

22360 (UCR)	U	1980	North Shore, E. end of Big Bear Lake, 0.25 mi. E of Stanfield Cutoff between 2 churches (Bennett/ UCR)	SBD
22359 (UCR)	U	1980	N shore, E end of Big Bear Lake, 0.25 mi. N of Hwy 18 near Division Drive, off the road to the rifle range, in drainage below houses on W side of Whispering Forest Tract (Bennett/UCR)	SBD
24626 (UCR)	U	1978	1.8-2.3 mi. N of Hwy 18 on Van Dusen Cyn. Rd. (Krantz/UCR)	SBD
104655 (UCR)	U	1996	1.5 mi. S of State Hwy 38, immediately W of Maple Lane, just N of town of Sugarloaf, T2N/R1E/S13 (Wear/UCR)	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Primary threats to *Physaria kingii* ssp. *bernardina* are loss and degradation of habitat resulting from roads, vehicle use off classified roads, ski area expansion and operation, dispersed recreation, prospecting and small-scale gold mining, fuels and vegetation management, fuelbreak construction and maintenance, and development of private lands. Because this species occurs in upper montane coniferous forest that is experiencing a moderate level of tree mortality, future fuels and vegetation treatments may threaten occurrences. Opening the canopy in this species habitat may be favorable for this species, however the mechanical disturbance associated with such treatments may counteract the benefits. Substantial efforts have been taken to avoid and minimize impacts from ski area expansion to *Physaria kingii* ssp. *bernardina* (Neel 1994). Approximately 10% of occupied habitat for this species on National Forest Systems lands is under claim for gold mining, and impacts related prospecting and working these claims continues to impact this species.

Habitat continues to be lost or further degraded on private lands, and habitat degradation on National Forest System lands continues adjacent to residential areas primarily via mountain biking off classified

roads and trails. Degradation of habitat also continues at the top of Geronimo Run at Bear Mountain Ski Resort. Most occurrences are remote and experience only minor impacts, and are presumed stable (USDA Forest Service 2003).

Conservation and Management Considerations

Measures to address and mitigate threats to *Physaria kingii* ssp. *bernardina* are addressed in a draft recovery plan (U.S. Fish and Wildlife Service 1997) and the *Conservation Study for Five Carbonate Plant Species: a study of land use conflict in the San Bernardino National Forest* (USDA Forest Service 1996). Conservation measures may include fence construction, signing, and closure of non-system roads in occupied habitat, restoration and protection of carbonate plant habitat, and control or removal of invasive non-native plants.

The primary short-term conservation strategy for this species is to continue to monitor known occurrences, and to survey mapped suitable habitat for undiscovered occurrences. Implementation of the Carbonate Habitat Management Strategy, while it does not directly address this species, may have some indirect benefits for its conservation. The following list of conservation practices should be considered for *Physaria kingii* ssp. *bernardina*:

- Utilize the habitat suitability criteria and detection protocol developed for this taxon and apply to surveys at the project level. This will help to ensure that future projects and management actions with effects to this taxon will trigger the appropriate standards, even where occurrences are currently not known.
- Survey all new occurrences of *Physaria kingii* ssp. *bernardina* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Implement the CHMS
- Collect a herbarium voucher specimen of *Physaria kingii* ssp. *bernardina* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Physaria kingii* ssp. *bernardina* in area using NRIS data collection standards, and incorporate these occurrences into the GIS database.

Evaluation of Current Situation and Risks on National Forest System Lands

Physaria kingii ssp. *bernardina* is a locally-common narrow endemic species known only to occur in the Big Bear Valley area, and entirely on carbonate (primarily dolomite). Some of these habitat areas are protected from identified threats, although most others are not well protected.

Based on the above analysis, *Physaria kingii* ssp. *bernardina* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the plan area with substantial threats to

persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	B	B	C	B

Physaria kingii ssp. *bernardina* is listed under the federal Endangered Species Act as endangered, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level. Existing protections afforded this species and its critical habitat under the Endangered Species Act provide considerable baseline protection.

The primary protective measure related to land use zoning is the Bertha Ridge Critical Biological zone. This zone would be established under Alternatives 2, 3, 4, 4a, and 6, and is essential to the viability of this species.

Consideration of the Standards related to roads, recreation and mining management factor into these outcomes. The proposed Bertha Critical Biological zone, where applied, is critical to these outcomes.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	B	B	C	B

Because only a very small fraction of this species' distribution is on private land, and most of this habitat has already been lost or severely degraded by residential development, the outcomes for the entire range are the same as for NFS lands.

By maintaining the current distribution of *Physaria kingii* ssp. *bernardina* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Physaria kingii* ssp. *bernardina* to suffer a decline in its overall distribution.

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Phlox dolichantha

Pinus attenuata

Pinus attenuata

Pinus attenuata Lemmon (Knobcone pine)

Management Status

Federal: None

California: not listed (California Natural Diversity Database)

Heritage Rank: not ranked (California Natural Diversity Database)

California Native Plant Society (2001): not listed

General Distribution

Pinus attenuata occurs from southwest Oregon to Baja California, Mexico (Lanner 1999). In California, it occurs in the Klamath and Cascades ranges, western edge of the Modoc Plateau, the Sierra Nevada, north and south Coast Ranges, and in the San Bernardino and Santa Ana Mountains in southern California.

Distribution in the Planning Area

While *Pinus attenuata* is more common in northern and central California, disjunct stands occur naturally in the southern California forests at just a few locations: in the northern Santa Lucia Range of Monterey County, in San Luis Obispo County at Cuesta Pass, in the western San Bernardino Mountains, and in the Santa Ana Mountains (Stephenson and Calcarone 1999). Approximately 1,233 acres (499 hectares) of *Pinus attenuata* habitat are mapped at these locations, 85 percent of which is located on public lands. In the San Bernardino Mountains, stands of *Pinus attenuata* cover approximately 990 acres (400 hectares) between City Creek and Government Canyon. In the Santa Ana Mountains, small stands of this pine occur in otherwise chaparral-dominated areas on the slopes of Sugarloaf, Pleasants, and Santiago Peaks. The stand at Pleasants Peak grows on serpentine soils (Stephenson and Calcarone 1999). *Pinus attenuata* has been documented from the Los Padres National Forest / Fort Hunter Liggett interface, by two specimens collected during the Fort Hunter Liggett floristic survey (Painter per. comm.). For additional information regarding studies done on Cuesta Ridge prior to 1976 see Bollong (1976) (Painter per. comm.).

Taxonomy and Natural History

Pinus attenuata is a gymnosperm in the pine family (Pinaceae). It is distinguished from similar members in the genus by cone and seed features (Griffin 1993). The needles usually grow in clusters of three.

Pinus attenuata is an evergreen conifer. It has serotinous cones and is dependent on fire for seed dispersal (Vogl 1973).

Habitat Description

Pinus attenuata has been reported from sea level to over 5,500 feet (1,675 meters), though stands usually occupy a transitional zone between lower chaparral/woodland and higher elevation conifer forest. Some of the associates throughout its range include Sargent, McNab, and Santa Cruz cypress, ponderosa, lodgepole, and western white pine, white fir, incense cedar, and Douglas fir. Usually restricted to dry, rocky sites with shallow soils, *Pinus attenuata* is typically found on infertile substrates that limit competition from other conifers. *Pinus attenuata* can be the dominant plant on serpentine outcrops where it is noted for its ability to pioneer these infertile sites (Vogl 1973). *Pinus attenuata* are usually found growing with a few dwarfish and chlorotic shrubs growing among them (Lanner 1999). In the Santa Ana Mountains, *Pinus attenuata* is restricted to serpentine and is associated with other serpentine endemics such as *Ceanothus papillosus* var. *roweanus* and *Ribes malvaceum* var. *viridifolium* (Vogl 1973). On adjacent non-serpentine soils, dense chaparral (shrub oaks and chamise) can virtually exclude *Pinus attenuata*. *Pinus attenuata* attains its maximum growth on non-serpentine sites, but the chaparral shrubs are too competitive on these more fertile soils (Vogl 1973).

Occurrence Status

Population status and trends for *Pinus attenuata* on National Forest System lands are unknown.

Threats

The life cycle of *Pinus attenuata* seems dependent on fire (Vogl 1973). Fire creates the pioneer conditions that are necessary for releasing seed from the closed cones for seedling germination. Trees begin dying when they are about 50 years old, and stands over 75 years in age are practically non-existent (Vogl and others 1988). Because *Pinus attenuata* has a relatively short life span and depends on fire for regeneration (Vogl 1973), fire suppression activities in the areas of the disjunct *Pinus attenuata* stands could decrease overall population sizes over an extended period of time. *Pinus attenuata* commonly occurs on steep slopes and shallow soils that are subject to erosional activities such as rock weathering (Vogl 1973) and fire, road and trail construction, and other activities that remove vegetation could increase the potential for erosion.

Conservation and Management Considerations

Use prescribe fire to maintain stands of *Pinus attenuata* where fire suppression is limiting natural

regeneration.

Evaluation of Current Situation and Threats on National Forest System Lands

Pinus attenuata is widely distributed in the planning area and no threats to stands on National Forest System lands have been identified.

Based upon the above analysis *Pinus attenuata* has been assigned the following threat category:

3. Common or widespread in Plan area with no substantial threats from Forest Service activities

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Pinus attenuata* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Pinus attenuata* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Physaria kingii ssp. bernardina

Piperia leptopetala

Piperia leptopetala

Piperia leptopetala Rydb. (Narrow-petaled rein orchid)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Piperia leptopetala occurs in the Cascade Range, Sierra Nevada, North Coast Range, South Coast Range, Transverse Range, and Peninsular Range, in 16 California counties. In California, *Piperia leptopetala* extends as far inland as Nevada County. Although it has a widespread overall distribution, *Piperia leptopetala* is highly uncommon: in each of 12 of these counties there is only one record for this species (Coleman 1995, Wilken and Jennings 1993).

Distribution in the Planning Area

There are two reported occurrences on or adjacent to the San Bernardino National Forest. One of these is a collection from Mill Creek (3800 ft.), presumably near Thurman Flats (Krantz et al. 2000). The other is an unconfirmed record from the Rim Forest area (USDA Forest Service 2003). There is also an observation in 1948 from Holy Jim Canyon on the Cleveland National Forest (CalFlora 2002). The record from near Klau is in the Santa Lucia range in San Luis Obispo County, but not within the LPNF.

Taxonomy and Natural History

Piperia leptopetala is a dicotyledon in the orchid family (Orchidaceae). This plant blooms between May-July (California Native Plant Society 2001). *Piperia leptopetala* is a 15-70 cm plant. The leaves are basal, 7-15 cm, and 15-30 mm wide. The inflorescence is 4-40 cm and more or less open. The flower perianth is green. The upper sepal is erect to recurved, and the lower sepals are reflexed. The lateral petals are more or less linear, spreading to erect, and more or less recurved. The lip is 2.5-5 mm, narrowly lanceolate, and pointed forward or down. The spur is 4-7 mm, curved, and pointed

down (Wilken and Jennings 1993).

Habitat Description

Piperia leptopetala grows in open mixed or coniferous forest in light to moderate shade between 400-2200 m. Plants may occur on fairly steep hillsides and on relatively flat terrain. In parts of its range, *Piperia leptopetala* sometimes grows in stands of poison oak (Coleman 1995). Mixed forest and conifer forest are widespread within the southern California National Forests. However, there may be specific microhabitat requirements for *Piperia leptopetala* that are much more narrowly restricted.

Occurrence Status

Although *Piperia leptopetala* has a widespread distribution, populations are sparse and generally contain only a few individuals. Most occurrences of *Piperia leptopetala* consist of less than ten plants and up to a maximum of thirty (Coleman 1995).

The following table shows the number of occurrences recorded in the literature, and the general location of these occurrences. There are no occurrences recorded in the California Natural Diversity Database (California Natural Diversity Database 2004).

OCCURRENCE DATA – *Piperia leptopetala* (Narrow-petaled rein orchid)

Occurrence No.	No. of Plants	Year Reported	Location/Land Owner	County
CalFlora 1296240 UC1178460 Kamb	U	1948	Holy Jim Canyon. Santa Ana Mountains. CNF.	Orange
UCR Roos 5773	U	1952	Mill Creek, S of Public Camp [Thurman Flats?], 3800 ft. SBNF?	SBD
*	U	U	Rim Forest Area. SBNF? UNCONFIRMED.	SBD
UC 1134751 Nordstrom	U	1937	1.6 mi. Southwest of Klau. Ownership unknown.	SLO

- *U = Unknown*
- * = *an occurrence number has not been assigned*

- *SBNF* = *San Bernardino National Forest*
- *SBD* = *San Bernardino County*
- *SLO* = *San Luis Obispo*

Threats

The reported occurrence in the Rim Forest area may be threatened by the construction of a water tank (USDA Forest Service 2003). In other areas, *Piperia leptopetala* may be threatened by vegetation management activities to reduce fuel loading around urban communities. Because populations are small and very sparsely distributed, the decimation of a single population may extirpate the species from a significant portion of its range (Coleman 1995).

Conservation and Management Considerations

The following list of conservation practices should be considered for *Piperia leptopetala*:

- Survey all new occurrences of *Piperia leptopetala* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Piperia leptopetala* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Piperia leptopetala* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

This species is known from only two or three locations in the national forests of southern California; one on the Cleveland National forest (Holy Jim Canyon) and 2 possibly on the San Bernardino (North of Thurman flats and Rim Forest). Exact locations are not known. Threats are not known on the Cleveland National Forest. The reported occurrence in the Rim Forest area may be threatened by the construction of a water tank (USDA Forest Service 2003). Conifer forests and chaparral types in Rim Forest and the Thurman Flats area have been affected by drought, and tree mortality has occurred in these locations. If *Piperia leptopetala* is extant within these areas, plants and habitat may be threatened by vegetation management activities to reduce fuel loading around urban communities and administrative sites. Because populations are small and very sparsely distributed, the decimation of a single population may extirpate the species from a significant portion of its range (Coleman 1995).

Based on the above analysis, *Piperia leptopetala* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	D	C

Piperia leptopetala is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Piperia leptopetala* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

On the San Bernardino National Forest, a backcountry non-motorized zoning in the Rim Forest Area would be retained under all alternatives except 4 and 5 where zoning would change to Backcountry Motorized. In the Thurman Flats area, all alternatives would be managed as DAI.

The real threat to these occurrences on the San Bernardino National Forest is the high potential for disturbance related to vegetation and fuels treatments to reduce threats of catastrophic fire. Alternatives do not differ in this regard. Therefore, because surveys are the priority for this species, all alternatives except Alternative 1 would provide for inventory efforts that would focus on the habitats and sites most likely to yield results in terms of locating additional populations of species at risk and monitoring and evaluation efforts would focus on the habitats and sites most likely to yield important information regarding trends in the abundance of distribution of species at risk.

On the Cleveland National Forest, Holy Jim Canyon is zoned as DAI and Backcountry Non-motorized in alternatives 1, 2, 4, 4A, and 6. It is within a recommended Wilderness Area in Alternative 3. Under Alternative 5, it would be managed as Backcountry motorized providing less protection to habitat than is currently in place. An increase in designation of roads and trails increases potential to affect this species because populations are small and very sparsely distributed, and the decimation of a single population may extirpate the species from a significant portion of its range (Coleman 1995).

Viability Outcomes for All Lands Within Range of Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	D	C

The majority of reported occurrences of *Piperia leptopetala* in the planning area occur on National Forest System lands. Except for Alternative 5, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Piperia leptopetala* to suffer a decline in its already very rare distribution.

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Plagiobothrys uncinatus

Plagiobothrys uncinatus Howell (Hooked popcorn-flower)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Plagiobothrys uncinatus is known from the Santa Lucia and Gabilan ranges in Monterey, San Benito, Santa Clara, and San Luis Obispo counties (Messick 1993, California Native Plant Society 2001). Most of the documented occurrences are historic, including those at Pinnacles National Park and the Hastings Reserve. The California Natural Diversity Database (2002) lists nine occurrences for this species; two of which are located on Fort Hunter Liggett. *Plagiobothrys uncinatus* has been documented from Fort Hunter Liggett by several collections: Hardham 5498 (CAS, RSA), Hardham 5572 (CAS, RSA, SBBG), Hardham 6893 (RSA, SBBG), and Hardham 10342 (RSA). *Plagiobothrys uncinatus* is also known from Camp Roberts (Painter 2004).

Distribution in the Planning Area

One of the *Plagiobothrys uncinatus* occurrences (S. Junak 4250/ OBI,SBBG) on the Los Padres National Forest is protected within the Cuesta Ridge Botanical Area (CalFlora 2002, Junak 1991). A second occurrence on the Los Padres National Forest is located west of Junipero Serra Peak in Hanging Valley (California Natural Diversity Database 2002). "The Indians," which is the type locality for this taxon (Matthews 1997), is also located on the Los Padres National Forest in the Monterey Ranger District. There is considerable unsurveyed potential habitat on the eastern third of the Monterey Ranger District.

Taxonomy and Natural History

Plagiobothrys uncinatus is a dicot in the borage family (Boraginaceae). It is separated from similar

members in the genus based on the nutlet shape and by the hooked bristles on the calyx lobes (Messick 1993, Matthews 1997).

Plagiobothrys uncinatus is an annual herb that blooms from April–May (California Native Plant Society 2001). *Plagiobothrys uncinatus* is a small, bristly, 4 to 12 inches (1-3 dm) tall. There are few to many spreading stems tinged purplish. The basal leaves are linear-oblong, 0.6 to 1 inch (1.5-2.5 cm) in length. The cauline leaves are oblong-ovate to ovate. The flower is composed of a calyx, 2-2.5 mm long with minutely hooked hairs and white petals. It blooms in April and May. The fruit is a nutlet, 1-1.3 mm long with narrow, lateral ribs.

Habitat Description

Plagiobothrys uncinatus occurs on sandstone outcrops and canyon slopes in chaparral, woodlands, and grasslands, often in burned or disturbed areas, at elevations of 980–2,400 feet (300–730 meters) (California Native Plant Society 2001, California Natural Diversity Database 2002, Matthews 1997).

Occurrence Status

Plagiobothrys uncinatus is distributed in a limited number of occurrences in California and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). Knowledge is low of the extent of its distribution on National Forest System lands, and population trends are generally unknown (Stephenson and Calcarone 1999).

Threats

No threats to *Plagiobothrys uncinatus* have been identified on National Forest System lands. Proposed projects would be analyzed at the project level.

Threats and possible threats at Camp Roberts (Painter 2004) include sheep, feral pigs, trespassing cattle, non-native plants, military training activities, vehicles, too frequent fires, fires in wrong season, activities related to recreational hunting, trampling, soil compaction, and dust. In addition, military operations at Fort Hunter Liggett may threaten populations at that facility.

Conservation and Management Considerations

Relocate historic occurrences and assess current habitat conditions and threats.

Evaluation of Current Situation and Threats on National Forest System Lands

Plagiobothrys uncinatus is uncommon, being known from only 9 locations, 3 of which are on NFS land. No threats have been identified for these locations.

Based upon the above analysis *Plagiobothrys uncinatus* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Plagiobothrys uncinatus is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Plagiobothrys uncinatus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Plagiobothrys uncinatus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Piperia leptopetala

Poa atropurpurea

Poa atropurpurea

Poa atropurpurea Scribn. (San Bernardino blue grass)

Management Status

Federal: Endangered

California: None

Heritage Rank: G2; S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3 (California Native Plant Society 2001).

Critical habitat has not been designated or proposed for this taxon.

General Distribution

Poa atropurpurea is reported from 22 occurrences in the San Bernardino Mountains of San Bernardino County and the Palomar and Laguna Mountains of San Diego County (California Natural Diversity Database 2004). In addition, several other occurrences are noted in the table below.

Distribution in the Planning Area

All occurrences of *Poa atropurpurea* are on or adjacent to the San Bernardino and Cleveland National Forests. In the San Bernardino Mountains, *Poa atropurpurea* is restricted to an eight mile radius (Krantz 1981). Populations on the San Bernardino National Forest occur in the Big Bear area from Holcomb Valley to the east slope of Sugarloaf Mountain. On the Cleveland National Forest, one occurrence is located in Mendenhall Valley south of Palomar Mountain, four are in the Laguna Mountains and one is at the southwest corner of Bear Valley, south of the town of Pine Valley (California Natural Diversity Database 2004).

Taxonomy and Natural History

Poa atropurpurea is a monocotyledon in the grass family (Poaceae). It is often found with Kentucky bluegrass (*Poa pratensis*), from which it may be distinguished by its short narrower inflorescences and floral features (Soreng 1993). *Poa atropurpurea* has purple panicles at anthesis and tends to flower

earlier in the year than Kentucky bluegrass (Sproul and Beauchamp 1979; Curto 1992). Curto (1992) noted that some populations of Kentucky bluegrass (*Poa pretensis*) in Laguna Meadow and Mendenhall Meadow show characteristics of *Poa atropurpurea* and may represent hybrid introgressions.

Poa atropurpurea is a dioecious rhizomatous perennial grass that flowers between April–June (California Native Plant Society 2001). Unless it is in flower, this plant is virtually indistinguishable from the surrounding grasses. Until recently, only pistillate (female) plants were known from herbarium specimens collected in the southern portion of its range, while both staminate (male) and pistillate inflorescences have been collected in the San Bernardino Mountains (Curto 1992). However, Hirshberg (1993, 1994) observed and collected voucher specimens of several staminate inflorescences during surveys of Laguna Meadow in the mid-1990s.

Habitat Description

Poa atropurpurea occurs in montane meadows and seeps at elevations of 4,400–8,000 ft (1,360–2,455 m) (California Native Plant Society 2001). The species is usually found on the edges of wet meadows in open pine forests and grassy slopes on loamy alluvial to sandy loam soils (California Natural Diversity Database 2002). *Poa atropurpurea* tends to occupy somewhat open areas on clay soils with less competition from more mesic species, such as *Poa pratensis*, *Carex* spp., and *Juncus* spp. These areas are often adjacent to wetter *Carex*/forb vegetation series and *Artemisia tridentata* or *Pinus jeffreyi*. At Bluff Lake, soils appear to be of a granitic, rather than clay, composition (Krantz 1981). Within meadows, *Poa atropurpurea* may prefer small rocky microhabitats (Reiser 1994).

An estimated 55,446 acres (22,438 hectares) of montane meadows occur in southern California, of which approximately 38% is occurs on public lands. The largest montane meadows and meadow complexes on and adjacent to National Forest System lands in southern California are on the Los Padres National Forest and on the Cleveland National Forest in the Laguna Mountains and near Mount Palomar. The majority of the large meadows in San Diego County are located on private lands (e.g., Cuyamaca, Mendenhall, French, and Dyche meadows).

There are approximately 4,430 acres of meadow habitat distributed in the San Bernardino and San Jacinto mountains (USDA Forest Service 2002).

Meadow habitat is sensitive to activities that alter hydrology, remove vegetation, or cause soil erosion, especially during the winter and spring when the ground is most saturated. In meadow systems, particularly those on steeper slopes, erosion removes topsoil and fine-textured alluvium, resulting in gully formation. The resulting channelized surface runoff causes increased erosion and stream incision, channeling water away from the meadow and effectively lowering the water table. Over time, increased drainage of meadow soils can lead to a shift in floristic composition to more drought-tolerant species and tree and shrub species. Grazing and trampling by livestock and other ground disturbances by recreational users such as hikers, mountain bikers, and vehicle use off classified roads encourage the establishment and spread of nonnative species which degrade meadow habitat (USDA Forest Service

2003). Meadows in the Laguna Mountains have been heavily grazed. These meadows typically support a variety of native annuals, herbaceous perennials, and Eurasian grasses (Reiser 1994).

Occurrence Status

At the southern end of its range, *Poa atropurpurea* populations appear relatively stable. Although Curto (1992) surveyed previously reported *Poa atropurpurea* locations in Laguna Meadow during June 1992 and found no plants at any of them, Hirshberg (1994) found sizeable populations (30–500 plants) at several of those same sites during April–May of 1994 indicating that timing of surveys is crucial for locating this species. Additional occurrences in Mendenhall Meadow on the Cleveland National Forest were located and mapped in 2001 (Winter, pers. comm.). Occurrences in the San Bernardino Mountains appear to be declining, primarily as a result of development pressures (Reiser 1994).

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Poa atropurpurea* (San Bernardino bluegrass)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1989	N shore of Baldwin Lake on both sides of Hwy 18. San Bernardino Mtns. Growing in meadow w/ <i>Sidalcea pedata</i> , <i>Thelypodium stenopetalum</i> , other sensitive spp. Some portion of population may be growing w/in adjacent pebble plain. Upstream development threatens springs. ORVs, illegal woodcutting and quartzite collection are management problems. SBNF/CDFG/TNC/PVT.	SBD

2	U	1988	S shore of Big Bear Lake, btw. Eagle Point and Stanfield Cutoff. Meadow vulnerable to trespassing and ORV damage. Wet meadows and springs near lake surrounded by Jeffrey pine forest. w/ <i>Sidalcea pedata</i> , <i>Thelypodium stenopetalum</i> , 13 other sensitive plants. PVT/TNC.	SBD
4	100 in 1994 at S end of meadow	1994	Mendenhall Valley, S of Palomar Mountain. PVT owner considering use of herbicides to rid meadow of wild roses (1981). 2 mi. long meadow w/ <i>Linanthus dianthiflorus</i> , <i>Limnanthes gracilis parishii</i> , <i>Ranunculus californicus</i> , <i>Carex</i> spp. Land used for cattle grazing. PVT/CNF. This is partially Cleveland National Forest. Additional occurrences on FS land within Mendenhall Meadow were located and mapped by CNF in 2001, grazing has been delayed until after seed set and plants appear to be doing well (Kopp)	SD
5	8 in 1976 just E of Big Laguna Lake; 50 in 1993 at S end of occ.; > 530 in 1994 in 5 patches	1976	Lower end of Laguna Meadow, from just N of Los Rasalies Ravine to S end of Big Laguna Lake, W of Mount Laguna. Grassland and seasonally wet meadow w/ <i>Carex</i> , <i>Juncus</i> , <i>Ranunculus californicus</i> , <i>Sidalcea malvaeflora</i> . 5 patches. Grazing, recreational hiking. PVT in CNF. This is now Cleveland National Forest land. Old occurrences have been found, grazing season	SD

			delayed until after seed set (Kopp).	
8	0 in 1978, 1992	1992	Low places near W edge of Filaree Flats, Laguna Mtns. Unknown when last seen. Land owner: CNF	SD
10	U	1986	ca. 1.5 mi. E of Holcomb Valley, San Bernardino Mtns. Wet meadow surrounded by Ponderosa pine forest. <i>Artemisia nova</i> dominant w/ <i>Eriogonum kennedyi</i> , <i>Antennaria dimorpha</i> , <i>Elymus smithii</i> , <i>Chrysothamnus viscidiflorus</i> , <i>Carex</i> , <i>Juncus</i> , <i>Bouteloua</i> , <i>Muhlenbergia</i> , <i>Senecio</i> , <i>Sporobolus</i> , <i>Sitanion</i> , <i>Stipa</i> . Rare associates = <i>Thelypodium stenopetalum</i> , <i>Sidalcea pedata</i> . SBNF.	SBD
11	2 in 2000	1988	Holcomb Valley, ca. 3 mi. N of Big Bear Lake, San Bernardino Mtns. Meadow w/ grasses and sedges on sensitive pebble plain-type substrate. Rare associates = <i>Taraxacum californicum</i> , <i>Pyrocoma uniflora gossypina</i> , <i>Castilleja lasiorhyncha</i> , <i>Perideridia parishii</i> . Also w/ <i>Juncus bufonius</i> , <i>J. kelloggii</i> , <i>Carex praegracilis</i> at edge to <i>Artemisia tridentata</i> scrub. Drainage through meadow is cutting banks and may result in lowered water table. CDF may help correct problem. Grazing has eliminated or reduced sensitive species while encouraging exotics. Meadow	SBD

			is currently fenced, monitored, and patrolled. SBNF/PVT.	
12	< 10,000 in 1983	1983	Cienega Seca, 1 mi. SW of Onyx Peak, San Bernardino Mtns. Wet montane meadow; heavy soils w/ Saragosa quartzite gravel. w/ <i>Taraxacum californicum</i> , <i>Castilleja cinerea</i> , <i>Juncus</i> , <i>Carex</i> , <i>Artemisia tridentata</i> , <i>Cirsium tioganum</i> . Human disturbance and hydrologic changes. Grazing also a threat. Site proposed as RV campground. PVT in SBNF. Owned by the Boy Scouts. Now managed by the Wildlands Conservancy in 2003 (Kopp)	SBD
13	U	1977	E edge of Bluff Lake. Meadow at edge of lake w/ <i>Ranunculus californicus</i> , <i>Juncus balticus</i> , <i>Achillea millefolium</i> , <i>Trifolium variegatum</i> , <i>Lupinus confertus</i> , <i>Poa pratensis</i> , <i>Sidalcea pedata</i> , <i>Castilleja lasiorhyncha</i> , <i>Perideridia parishii parishii</i> , <i>Taraxacum californicum</i> . Past uses include camp development and grazing. PVT in SBNF. The Wildlands Conservancy.	SBD
14	U	1977	Town of Big Bear Lake, just S of Meadow Park. <i>Packeria bernardina</i> nearby. PVT.	SBD

16	U	1984	Presbyterian Conference grounds W to S shore of Metcalf Bay, Big Bear Lake. In meadows and grasslands at 6720-6800 ft. w/ <i>Sidalcea pedata</i> . Urbanization and grazing. PVT.	SBD
17	17 female plants, 3 males in 2000	2000	E of Big Bear City, Pan Hot Springs Area. Along Hwy 18 at W end of Baldwin Lake. Meadow w/ <i>Sidalcea pedata</i> , <i>Thelypodium stenopetalum</i> , 6 other sensitive plants, incl. <i>Mimulus purpureus</i> , <i>Castilleja cinerea</i> . Contains high densities of <i>Poa atropurpurea</i> . Horse grazing, roadside dumping. City of Big Bear.	SBD
18	U	1981	Shay Meadow, near SE end of Big Bear Blvd. Big Bear City. Open meadow w/ alkaline to moderately drained alluvial clays. w/ <i>Carex athrostachya</i> , <i>Agropyron intermedium</i> , <i>A. desertorum</i> , <i>Trifolium variegatum</i> , <i>Trifolium wormskioldii</i> . Also w/ <i>Taraxacum californicum</i> . <i>Poa atropurpurea</i> absent where non-native <i>Agropyron</i> spp. is most prevalent. In grassland. PVT.	SBD

19	U	1981	Between Aeroplane Ln and Big Bear City Airport. Big Bear City. Open meadow on alluvial clays w/ <i>Artemisia tridentata</i> , <i>Ranunculus californicus</i> , <i>Achillea millefolium</i> , <i>Carex athrostachya</i> , <i>Taraxacum californicum</i> , <i>Perideridia parishii parishii</i> . Urbanization, grazing, hydrologic alteration. Incl. former occ. 20. PVT.	SBD
21	U	U	Moonridge, near golf course and ski areas, San Bernardino Mtns. Where Rathbone Creek and Deer Canyon drainages meet. w/ <i>Juncus</i> , <i>Carex</i> , just outside area w/ <i>Artemisia ludoviciana</i> . Urbanization, golf course, ski areas, and grazing are threats. Unknown when species was seen. PVT.	SBD
22	U	1981	Wildhorse Spring, 3.4 mi. SE of (town of) Woodlands. San Bernardino Mtns. Sandy clay soil. Wet meadow w/ <i>Juncus bufonius</i> , <i>Carex praegracilis</i> , <i>Potentilla wheeleri</i> , <i>Taraxacum californicum</i> . Surrounded by <i>Pinus contorta</i> , <i>Abies concolor</i> , <i>Juniperus occidentalis</i> . ORVs and past grazing. SBNF.	SBD
23	U	U	Erwin Lake, just E of (town of) Woodlands, at end of Meadow Lane. Unknown when species seen. PVT.	SBD

24	U	1984	<p>E end of Erwin Lake, ca. 1 mi. E of town of Woodlands, San Bernardino Mountains. Alkaline wet meadow w/ high densities of <i>Thelypodium stenopetalum</i>, 11 other sensitive plants. Nearly pristine meadow. Wintering bald eagle and waterfowl habitat. Mostly undisturbed and fenced, no hunting allowed. Grazing confined to non-sensitive areas, but no formal protection. PVT. Area surrounding lake bed being developed as Erwin Ranch community and lots on habitat are for sale in 2003.</p>	SBD
27	> 500 in 1994	1994	<p>N end of Laguna Meadow, extending N ca. 0.7 mi. from the N end of Laguna Lake, Laguna Mtns. In seasonally wet meadow w/ <i>Ranunculus californicus</i>, <i>Sidalcea malvaeflora</i>, <i>Juncus</i> spp., <i>Carex</i> spp. CNF.</p>	SD
28	50 in 1993; 50-75 in 1994	1993	<p>Between Little Laguna Lake and El Prado Meadow, ca. 1.2 mi. S of Oasis Spring. Laguna Mtns. Just N of Little Laguna Lake and just E of a fenced rock outcrop. In wet montane meadow w/ <i>Carex</i> spp., <i>Juncus mexicanus</i>, <i>Poa pratensis</i>, and near <i>Ranunculus californicus</i>. Hiking and grazing are threats. CNF.</p>	SD

29	U	1994	SW corner of Bear Valley, ca. 1.9 mi. SSE of Long Valley Peak summit, S of Pine Valley. In wet meadow w/ <i>Juncus mexicanus</i> , <i>Carex</i> spp., <i>Aster</i> spp., and <i>Poa pratensis</i> . Plants are located in the SW corner of Bear Valley Meadow. One 20X20 patch of plants observed in 1994; acc. to M. Curto, plants could all be one clone. Entire meadow was not surveyed, and occ. could be more extensive. Cattle grazing. CNF.	SD
805758 (CalFlora)	U	1989	San Bernardino Mts., Bear Valley region, in Jacoby Cyn., along Holcomb Valley Rd. (the Rd. from Baldwin Lake to Arrastre Flat), SW ¼ T3N/R1E/S36, elev. 7300 ft. (Taylor 10294/CalFlora)	SBD
1835997 (CalFlora) / UCR44561 (SMASCH)	U	1981	Mendenhall Meadow E of the dam (montane meadow) T10S/R01E/S12, elev. 1372m.(Dias/CalFlora)	SD
UC1574111 (SMASCH)	U	1981	Cleveland National Forest, Laguna Meadow (montane meadow near xeric margins), T25S/R5E/S15 (Diaz/CalFlora)	SD
UCR107888 (SMASCH)	U	1996	Laguna Mts., at a spring 1mi. N of the check dam on Big Laguna Lake, 0.5 mi. from the lake, Lat:32.88333/Lon: -116.4666, elev. 1677m (Hirshberg/CalFlora)	SD

UC573889 (SMASCH)	U	1937	E. end of Big Bear Lake, T2N/R1E/S16, elev. 6800 ft. (Yates/CalFlora)	SBD
UCR20090 (SMASCH)	U	1979	San Bernardino Mts., Big Bear Lake, Eagle Point, in meadow N of the junction of Swan and Oriole Drives, annually moist meadow, currently being developed for condominiums, T02N/R1E/S20, elev. 2058m (Krantz/CalFlora)	SBD
UCR27082 (SMASCH)	U	1981	San Bernardino Mts., wet meadow, upper Holcomb Valley, Caribou Creek area, T03N/R01E/S33 (Krantz/CalFlora)	SBD
UCR48004A (SMASCH)	U	1987	San Bernardino Mts., Foxfarm Rd. vicinity of Big Bear Lake, in a clay meadow, T02N/R01W/S21, elev. 2066m (LaPre/CalFlora)	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *CNF = Cleveland National Forest*
- *SBD = San Bernardino County*
- *SD = San Diego County*

Threats

The primary threats to this species are prospecting, dispersed recreational use, mountain bike use in meadow habitat, livestock grazing, and actions that alter hydrological regimes.

Poa atropurpurea is threatened by habitat destruction and alteration resulting from urban and recreational development, hydrological alteration, grazing by livestock, and competition from invasive nonnative plant species (USDA Forest Service 2000). Hybridization with a nonnative taxon has been speculated, however this has not been documented.

In 1998, wet meadow habitat in the Wildhorse Meadow area on the SBNF benefited by the removal of over 100 feral burros in the Big Bear area. One report of burros seen in occupied *Poa atropurpurea* habitat within Wildhorse Meadow was documented in 2004 (Eliason pers. comm.). Occupied habitat of *Poa atropurpurea* is managed for "no burro presence". If burros move into these areas, they will be removed; however this will depend on funding and staffing, so some low level of grazing impacts may periodically occur if burros stray into the habitat (USDA Forest Service 2000).

Approximately 81% of known *Poa atropurpurea* occurrences are under claim for mining or are on private lands with limited protection (USDA Forest Service 2000). About 91% of meadow habitat for this species has been eliminated since the turn of the 20th century. Approximately 70% of the remaining meadow habitat is unprotected and is consequently subject to development, wildlife viewing walks, fragmentation from off-highway vehicle (OHV) traffic, and grazing (U.S. Fish and Wildlife Service 1998).

A recovery plan for *Poa atropurpurea* is being developed but is not yet complete. It is likely that proper management of National Forest System lands will be crucial to the recovery of this species through protection of known occurrences, restoration/ reintroduction into historical and protected habitats, acquisition of lands that support occurrences or that are suitable for recovery efforts, and additional data collection and research to determine management needs (USDA Forest Service 2000).

The USDA Forest Service (2000) has identified site-specific threats to *Poa atropurpurea*. Limited protection measures have been taken to reduce impacts on montane meadows. Measures at specific meadow complexes are listed below (USDA Forest Service 2000).

The Belleville Meadow site, on the San Bernardino National Forest, is at risk from a variety of impacts and influences. Belleville Meadow has been drastically altered and manipulated through a century of mining, heavy grazing, and recreation activities. Without a withdrawal of mineral entry to protect unclaimed portions of the meadow and elimination of mountain biking and prospecting, this occurrence is at significant risk.

Belleville Meadow is a popular prospecting site and several gold claims overlap the *Poa atropurpurea* occurrence. Effects to occupied habitat under claim do not occur at this time, and a site specific analysis would be completed prior to approval of a Plan of Operation, however effects from prospecting do occur.

Direct impacts may result from ground-disturbing activities (*e.g.*, digging, sluicing, panning, storing/piling soil). Indirect impacts may occur as hydrological features of the landscape are changed (USDA Forest Service 2000). In addition, Forest Service roads essentially encircle Belleville Meadow, continuing to alter meadow hydrology and degrade the meadow habitat. The *Poa atropurpurea* occurrence is bisected by Forest Roads 3N05 and 3N16. The occurrence along 3N05 is crossed by trails between the adjacent Holcomb Valley Campground and Gold Fever Trail sites.

In this location and the Belleville Cabin site, fencing, signing to redirect trail use outside of habitat and additional patrol to maintain structures has been successful in protecting habitat. Occupied habitat continues to be affected however, south of Belleville Meadow along Caribou Creek by mountain bike use despite installation of physical barriers and signing to protect the area.

The Wildhorse Meadow site, also on the San Bernardino National Forest, is relatively well protected. It was fenced in the past to exclude cattle when the area was part of an active grazing allotment. The fence continues to protect occupied habitat from vehicle use off classified roads. The meadow itself experiences little to no recreation use. There are some meadow hydrology problems, partly from past overgrazing and partly from Forest roads that encircle almost the entire meadow. Past erosion control projects to reduce the amount of downcutting and dewatering in the meadow include a series of gabions that are still in place. The gabions were installed because of erosion resulting from roads at the top and bottom of the meadow. This site offers some potential restoration opportunities in the meadow as well as in the connected stringer meadows.

All *Poa atropurpurea* sites on the Cleveland National Forest are fairly well-protected at this time, although many of these sites have been disturbed in the past. Historical disturbances include cattle trails, telephone line trenching, and soil removal for dam construction. Sheep grazing occurred in Laguna Meadows for 10-20 years until the 1880's; after that period, cattle grazing occurred (Sproul and Beauchamp 1979). Grazing is the only current activity that may be affecting the three main populations. In all areas the season of use has been adjusted to exclude grazing until after *Poa atropurpurea* has flowered and set seed.

Conservation and Management Considerations

The following list of conservation practices should be considered for *Poa atropurpurea*:

- Monitor fence lines and repair as necessary.
- Continue implementing recommendations listed in CNF Meadow Habitat Management Guide, and the 2002 SBNF Meadow Habitat Management Guide.
- Implement actions to the greatest extent practicable in the USFWS Recovery Plan once it is completed.
- Apply the habitat suitability criteria and detection protocol developed for this taxon to surveys at the project level.
- Continue surveys for *Poa atropurpurea* on NFS lands on the San Jacinto District.
- Survey all new occurrences of *Poa atropurpurea* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Poa atropurpurea* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Poa atropurpurea* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

On the Cleveland National Forest, *Poa atropurpurea* is considered to have moderate vulnerability and the trend is increasing (Stephenson and Calcarone 1999). On the San Bernardino National Forest *Poa atropurpurea* is considered to have high vulnerability and the trend is declining (Stephenson and Calcarone 1999). *Poa atropurpurea* is 1) is endemic to southern California, 2) is restricted to montane meadows, a rare habitat type, 3) is present within mining claims, 4) is present within a high use recreation area, 5) is affected by unclassified trail, 6) occurs within active grazing allotments, and 7) is affected by changes in hydrological regimes such as roads that bisect habitat.

On the Cleveland National forest, livestock grazing has been delayed until after seed set for the last ten years. On the San Bernardino National Forest, fencing and signing to redirect use away from occurrences in Belleville Meadow and monitoring and completion of repairs in a timely manner have been successful. There is a possibility that future mining could affect the Belleville occurrence, however the probability is low. Habitat degradation caused by unclassified trail use, mountain biking within meadow habitat and changes to hydrological regimes appear to be the largest threats at this time. Implementation of strategies listed in both the CNF (USDA Forest Service 1991) and SBNF (USDA Forest Service 2002) Meadow Habitat Management Guides will provide continual protection for this species.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	B	C	A

Poa atropurpurea is listed under the Endangered Species Act of 1973, as amended, as endangered, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

The viability of this species is primarily tied to protection and management of meadow habitat. To provide for viability and recovery of this species, some of the most important habitat for this species must be clearly and substantially protected.

With implementation of the Meadow Habitat Management Guides on the Cleveland and San Bernardino National Forests and strategies proposed to the greatest extent possible when the USFWS Recovery Plan is completed, viability for this species on NFS lands is secure.

Land use zoning, recommended special area designations and Standards were used in predicting viability outcomes on NFS lands. On the Cleveland National Forest, under Alternative 1, the Laguna and Mendenhall occurrences would be managed as Back Country Non-Motorized and Back Country respectively. Under Alternatives 2, 3, 4 and 4a, both locations would be managed as Back Country Non-Motorized, with a small amount of habitat managed as Back Country in Alternative 3. Under Alternative 5, both locations would be managed as Back Country. Under Alternative 6, both locations would be managed as Critical Biological zones.

On the San Bernardino National Forest, the Belleville and Wildhorse Meadow occurrences under all alternatives except 4a and 6 would retain Back Country Motorized management. In 4a, the Belleville occurrence is zoned Back Country Motorized and Back Country Motorized Use Restricted. In Alternative 6, the Wildhorse Meadow occurrence is zoned as Back Country Non-Motorized; Belleville Meadow would be managed under a combination of Backcountry Motorized and Backcountry Non-Motorized zoning.

In Alternatives 2, 3, 4a and 6, the occurrence at Wildhorse Meadow on the SBNF would receive additional protection by establishment of the Wildhorse Meadow Research Natural Area. Under Alternatives 3 and 6 the Wildhorse occurrence would be managed by designation of the Wildhorse Special Interest Area, a designation that would provide a lower level of habitat protection than a Research Natural Area. Designation of this area as both an RNA and an SIA is conflicting use; Forest leadership prefers that the RNA be established in both alternatives. In alternatives 2,3,4, 4a and 6, The suitable habitat acres within the South Baldwin Lake and the Sugarloaf Meadow Critical Biological zones have a high likelihood of being occupied by *Poa atropurpurea* and would receive long-term protection within this zone.

Under Alternative 1, current management would be retained. No additional habitat protection would be provided under special designations or zoning. Under Alternative 4, impacts associated with higher levels of expected recreational use would be minimized by expected increases in management control and monitoring, however because the Wildhorse Meadow Research Natural Area would not be designated under this alternative, the likelihood of persistence for this species under this alternative is lower. Under Alternative 5, there would be increased threats across the range of the species as a result of an increase in road and trail designation and use and additional water diversions/extractions. Alternatives 2, 3, and 4a would provide increased protection as the Wildhorse RNA is established. The highest level of protection and the most potential for recovery would occur under Alternative 6, as Critical Biological zones would become established in Laguna and Mendenhall Meadows on the Cleveland National Forest and the Wildhorse Meadow Research Natural Area would become designated on the San Bernardino National Forest. Recovery of this species is expected to occur sooner under Alternatives 3 and 6 due to the emphasis on protecting ecological integrity.

Several Standards are specifically applicable to protection of this taxon and were also used in predicting viability outcomes on NFS lands. On the CNF, two Standards are applicable. The current Standard in Alternative 1 that delays grazing in occupied *Poa atropurpurea* habitat until after seed set has been brought forward under Alternatives 2-6 as CNF Place Standard S11. The Standard CNF S16 limits mountain biking and horseback riding to system roads and trails within the Laguna Mountain Recreation Area. This would help to protect occurrences within Laguna Meadow from effects of dispersed recreation.

On the SBNF, two Standards are applicable: the Forest-wide Standard S33 states that within Special Interest Areas, activities and discretionary uses are either neutral or beneficial for the resource values for which the area was established. Short term adverse impacts to these resource values can be accepted if such impacts will be compensated by the accrual of long-term benefit. This would apply to 67 acres of occupied habitat within the existing North Baldwin Holcomb Valley SIA. Under Alternatives 2-6, this Standard would provide a higher level of protection to those taxa within the existing SIA when new projects are proposed. Forest-wide Standard S35 requires that motorized and non-motorized vehicle travel is restricted to Forest system roads and trails and limited areas that are designed for vehicle use. This would provide protection to the Belleville Meadow occurrence that is often affected by mountain bike use within habitat. Forest-wide riparian and recreation management, ground water extraction and mining standards are also important across both Forests and were used in predicting these outcomes.

Use of additional Standards that relate to riparian areas, mining, dispersed recreation and special use management related to water withdrawal were also important in predicting outcomes. Implementation of actions listed in CNF and SBNF Meadow Habitat Management Guides and strategies suggested in the USFWS Recovery Plan once it is finalized also factor in to this outcome. The proposed Wildhorse RNA is essential for favorable viability outcomes when high levels of recreational use are promoted.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	B

Poa atropurpurea is reported from only 21 occurrences in the San Bernardino Mountains of San Bernardino County and the Palomar and Laguna Mountains of San Diego County (California Natural Diversity Database 2002). Due to past and current urban development in habitat, protection of this species will likely be dependent on NFS management. Occurrences on private lands are being extirpated by creation of housing developments; other sites are degraded by grazing, vehicle use, recreational use, dumping, and hydrologic alteration (California Natural Diversity Database 2002). As private land

development increases, the demand for water and new diversions/extractions increases. This in turn increases the potential for changes in hydrological regimes that could affect wet meadow habitat. By maintaining the current distribution of *Poa atropurpurea* on National Forest system lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause the species to suffer a decline in its overall distribution.

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Podistera nevadensis

Podistera nevadensis (A. Gray) S. Watson (Sierra podistera)

Management Status

Federal: Forest Service Watch list

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Podistera nevadensis is endemic to California. Occurrences are known from northern and central California in the Sierra Nevada (Alpine, Eldorado, Mono, Placer, and Tuolumne Counties) and White and Inyo Mountains. Occurrences in Tuolumne County include Mt. Dana, Granite Divide, the west slope of Mt. Gibbs, and Kuna Crest in Yosemite National Park, Mammoth Peak, North Peak, Lyell Canyon, White Mountain, and Mount Conness. Collections have been made in El Dorado County from Freel Peak. In Mono County, *Podistera nevadensis* is known from Slate Creek Basin of White Mountain, Dana Plateau in Yosemite National Park, Mount Dana, Mount Warren, Saddlebag Lake, and Arrowhead Lake (CalFlora 2002). There is one disjunct historical occurrence in the San Bernardino Mountains (Krantz, et. al. draft 2002)

Distribution in the Planning Area

In southern California, the only known occurrence is reported from Sugarloaf Ridge on the Mountaintop District of the San Bernardino National Forest. This occurrence has not been observed in many years, but the habitat is extant.

Taxonomy and Natural History

Podistera nevadensis is a perennial dicotyledon in the carrot family (Apiaceae) (Constance 1993). It is the only species in this genus in California. *Podistera nevadensis* is a perennial herb that blooms July–September (California Native Plant Society 2001). *Podistera nevadensis* forms compact 2-5cm cushions, extending 2-5 dm in diameter. The petiole is 3-15 mm, conspicuously white scarious-

sheathing.

The leaves have a blade that is 3-10 mm, oblong to ovate, once-pinnate. The leaflets are 1-6 mm, linear to lanceolate, entire, and pointed. The inflorescence is characterized by a 5-30 mm peduncle. There are no bracts. The bractlets are 2-4 mm, more or less equal to the flowers and fruits, ovate, and strongly fused into a cup. The rays are winged and very short. There are 0-few pedicels which are less than the fruit. The corolla is yellow, and fruit are 4-4.5 mm, oblong to ovate, with thread-like ribs, and 3-4 oil tubes per rib interval (Constance 1993). The flowering period occurs shortly after snowmelt (Shevock, pers. comm.)

Habitat Description

Podistera nevadensis typically inhabits alpine boulder and rock fields and granitic scree above timberline at elevations of 9,800-13,100 feet (3,000-4,000 meters) (California Native Plant Society 2001, Constance 1993).

Occurrence Status

The California Natural Diversity Database (2004) does not contain any records for *Podistera nevadensis*. Within the plan area, *Podistera nevadensis* is known from a single historical record. In 2002, two botanists from the San Bernardino National Forest searched unsuccessfully for this species on Sugarloaf Ridge. They surveyed the ridgetop and north slope of Sugarloaf Ridge from Green Canyon to Sugarloaf Mountain and noted that there was little scree habitat in lodgepole pine forest. In the future, the south slope of Sugarloaf Ridge, which presumably has more suitable habitat for this species should be surveyed.

In addition, there are several records from Tuolumne and Mono counties in and around Yosemite National Park.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Podistera nevadensis* (Sierra podistera)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
*	U	U	Sugarloaf Ridge. SBNF.	SBD

- *U = Unknown*
- * = *an occurrence number has not been assigned*

- *SBNF* = *San Bernardino National Forest*
- *SBD* = *San Bernardino County*

Threats

In southern California, this plant is only known from the ridgetop and scree slopes on Sugarloaf Mountain on the San Bernardino National Forest. Sugarloaf Mountain is one of the more popular hiking destinations on the Forest. Trails to the peak are accessed on a regular basis during all months of the year. Hiking, backpacking, snowshoeing and cross country skiing occur on the trails and on north, south and western slopes of the mountain. The toe of the mountain is located less than a mile south of the community of Sugarloaf where prevention of wildfire is a concern. The highest threat to this species is the potential for a fuelbreak to be constructed along the top of Sugarloaf Ridge. In October 2003, contingency dozer lines were planned for construction across the entire length of Sugarloaf Ridge from Wildhorse Meadow west to Clark's Summit to protect the Big Bear area from the wildfire below. Line construction began in the western portion and was to continue easterly along the ridge but was halted due to change in fire weather. Since the area on the south side of the mountain did not burn, chances are high that this line would be proposed again in the event of another wildfire. The completion of the shaded fuelbreak (after the 2003 Old Fire) on the south side of the Sugarloaf housing community reduces the level of need for this type of fuelbreak, however many fire agencies in the Big Bear area would still like to see a fuelbreak on the top of Sugarloaf ridge completed.

Threats to the *Podistera nevadensis* occurrence may also include trampling along the ridgetop of Sugarloaf Mountain (USDA Forest Service 2002), currently an Inventoried Roadless Area, and effects to habitat from fire suppression activities related to current methods of fire fighting such as helicopter landing sites and suppression of lightning caused fires that frequently occur on this ridge. However, these effects are minimal because habitat for this species occurs in scree that would be avoided by these activities.

Conservation and Management Considerations

The following list of conservation practices should be considered for *Podistera nevadensis*:

- Survey potential habitat on Sugarloaf Mountain shortly after snowmelt when this compact yellow umbel will be putting on a burst of yellow flowers.
- Collect information on vouchered specimen and use this to conduct surveys to relocate the historical occurrence of *Podistera nevadensis* on Sugarloaf Ridge. Assess threats and define suitable habitat to assist in future surveys.
- If enough individuals are located, collect a herbarium voucher specimen of *Podistera nevadensis* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Podistera nevadensis* in the area using National Resource Inventory System data collection standards, and incorporate these occurrences into the corporate

GIS database.

Evaluation of Current Situation and Threats on National Forest System Lands

Sugarloaf Mountain is an Inventoried Roadless Area that is adjacent to the town of Sugarloaf, an urban housing community. A shaded fuelbreak has been constructed along the perimeter of the community in the Wildland Urban Interface defense zone, however some fire management personnel would prefer that a fuelbreak be in place on the top of Sugarloaf ridge to control wildfires originating from the south before they reach the Wildland Interface defense zone. This ridgeline fuelbreak is the biggest concern for this species and it is substantial. That this fuelbreak could be constructed under emergency conditions is an even higher threat as the most damage could occur at this time. Vegetation treatments to reduce fuels within the Wildland Urban Interface defense and threat zones are also a threat to this taxon. The fact that this taxon grows in scree may provide some level of protection as these areas may provide protection from heavy equipment. The absence of precise locality information for *Podistera nevadensis* increases the threat level.

Based on the above analysis, *Podistera nevadensis* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	A	B	C	A

Podistera nevadensis is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Podistera nevadensis* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Under Alternative 1, habitat on Sugarloaf Mt. would retain zoning as Back Country Non-Motorized. Under Alternative 2, the south side of Sugarloaf Mt. would retain Back Country Non-Motorized zoning and the north side would be recommended as the Sugarloaf Wilderness. Under Alternatives 3, 4 and 6, all of Sugarloaf Mountain would be recommended as Wilderness. Under Alternative 4a, the south side Back Country Non-Motorized zoning would be retained to the top of the ridgeline. From below the ridgeline to the north and downslope to the floor of Big Bear Valley would be zoned as Back Country Motorized Use Restricted. Under Alternative 5, the current Back Country Non-Motorized zoning would

be changed to Back Country, lessening habitat protection for this species.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	A	B	C	A

The one disjunct occurrence in southern California is located on the San Bernardino National Forest. By maintaining the current distribution of *Podistera nevadensis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this species to suffer a decline in its overall distribution.

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Poa atropurpurea

Polygala cornuta var. fishiae

Polygala cornuta var. fishiae

Polygala cornuta Kell. var. *fishiae* (Parry) Jepson (Fish's milkwort)

Management Status

Federal: None

California: None

Heritage Rank: G5T4, S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4 R-E-D Code 1-1-2

General Distribution

Polygala cornuta var. *fishiae*, Fish's milkwort, occurs in the outer south Coast Ranges, Transverse Ranges, and Peninsular Ranges from Santa Barbara County south to Baja California, Mexico (California Native Plant Society 2001, Wendt 1993).

Distribution in the Planning Area

Polygala cornuta var. *fishiae* occurs on or adjacent to National Forest System lands on the Los Padres, Angeles, and Cleveland National Forests (CalFlora 2002).

Taxonomy and Natural History

Polygala cornuta var. *fishiae* is a deciduous shrub that blooms May-August and is a member of the Milkwort family (Polygalaceae) (California Native Plant Society 2001). It is one of two varieties of *Polygala cornuta* that occur in California (Wendt 1993). Variety *fishiae* has a more southern distribution in California than variety *cornuta*. *Polygala cornuta* var. *fishiae* is a shrub, whereas *Polygala californica* (California milkwort), the only other species of *Polygala* that occurs in this area, is a rhizomatous perennial herb (Wendt 1993).

Polygala cornuta var. *fishiae* often forms thickets of less than 6 feet diameter, having decumbent to erect stems of 6-25 dm. Linear to ovate leaves are more than twice as long as wide. Flowers 7-11.2 mm, upper sepal rounded, outer sepals and wings are dark pink in buds, and wings are ciliate, glabrous, or puberulent near the tip. Fruit is thin textured, dark yellow-brown, and is 5.9-7.3 mm including stalk

(Wendt 1993).

Habitat Description

Polygala cornuta var. *fishiae* occurs in chaparral, oak woodlands, and riparian woodlands below elevations of 3,600 feet (1,097 meters) (California Native Plant Society 2001). Although habitat requirements of this taxon typically include open xeric microclimates, individuals have been observed on shady, mesic, north-facing slopes (Reiser 1994).

Occurrence Status

Polygala cornuta var. *fishiae* is found in sufficient numbers and distributed widely enough that its potential for extinction is considered to be low (California Native Plant Society 2001). Sparsely distributed and categorized by California Native Plant Society as a List 4 plant, this taxon is considered too common for California Natural Diversity Database tracking. It is not well known within its range, although populations are presumed to be stable (Reiser 1994). Few individuals occur at each locality where it is present. The National Forests do not currently track occurrences of *Polygala cornuta* var. *fishiae*. Occurrences shown below are recent incidental sighting reports and do not represent all potential occurrences on National Forest System lands.

OCCURRENCE DATA - *Polygala cornuta* var. *fishiae* (Fish's Milkwort)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
*	*	U	1990	Santa Ana Mtns., ridge between Black Star Canyon and Hagador Canyon / CNF	RIV / OR
*	*	U	1990	Santa Ana Mtns., Hall Canyon / CNF	RIV / OR
*	*	U	2001	Lawson Peak / CNF	SD
*	*	U	2001	Poser Mountain Peak / CNF	SD

- *U* = Unknown.

- * = an occurrence number has not been assigned.
- CNF = Cleveland National Forest
- OR = Orange County
- RIV = Riverside County
- SD = San Diego County

Threats

Limited San Diego County populations of *Polygala cornuta* var. *fishiae* are likely stable, but potentially affected by recreational activities.

Conservation and Management Considerations

Due to its lower elevation distribution, conservation of this species will depend on efforts outside of Forest Service actions. The following is a list of conservation practices that should be considered for *Polygala cornuta* var. *fishiae*:

- Document and map occurrences during surveys to the extent practicable.

Evaluation of Current Situation and Threats on National Forest System Lands

Polygala cornuta var. *fishiae* is uncommon but widespread in southern California. Because it is not listed as a Forest Service Sensitive species, occurrences of this taxon have not been systematically noted or monitored on National Forest System lands. This makes assessing its status difficult. However, available information does not indicate that it is at risk from Forest Service activities. Some occurrences may be in areas affected by recreation use, but there is no indication that this activity has a negative impact on the species. Most of the distribution of *Polygala cornuta* var. *fishiae* lies below the elevation of National Forest System lands. Sparsely distributed and categorized by California Native Plant Society as a List 4 plant, this taxon is considered too common for California Natural Diversity Database tracking.

Based upon the above analysis this species has been assigned the following threat category:

3. Widespread in Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Polygala cornuta* var. *fishiae* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Polygala cornuta* var. *fishiae* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Podistera nevadensis

Populus tremuloides

Populus tremuloides

Populus tremuloides Michaux (Quaking aspen)

Management Status

Federal: None

California: None

Heritage Rank: None

California Native Plant Society: None

General Distribution

Populus tremuloides has a widespread distribution in North America, and is a dominant species across large portions of the Rocky Mountains. But in California its distribution is patchy. There are large aspen stands in the Sierra Nevada and White Mountains in California and a relatively small stand in the Sierra San Pedro Martir of Baja California Norte. However, *Populus tremuloides* is absent in the Peninsular and Transverse Ranges of southern California, with the exception of two small groves in the San Bernardino Mountains (Thorne 1988).

Distribution in the Planning Area

Both small groves of *Populus tremuloides* occur on the San Bernardino National Forest. One occurrence is along Fish Creek in the San Gorgonio Wilderness Area. The other is approximately six miles away along a seasonal tributary of upper Arrastre Creek (7160-7225 ft.) (Jones 1989, Thorne 1988). These two occurrences have a combined area of less than 50 acres (20 hectares), all of which is located on National Forest System lands. A third grove, reportedly mapped in 1935 by D. Axelrod, may still exist 25-30 miles west of Lake Arrowhead (Jones 1989), but has not been recorded since Axelrod. The San Bernardino Mountains aspen groves are probably relicts of the Pleistocene when conditions were cooler and wetter and the area presumably supported more groves (Jones 1989).

Taxonomy and Natural History

Populus tremuloides is a dicot in the willow family (Salicaceae). There are four native species of

Populus in California; *Populus tremuloides* is distinguished by its leaf shape and size (Sawyer 1993). *Populus tremuloides* is a deciduous tree that blooms in late spring (Sawyer 1993). Aspen rarely reproduce by seed; trees generally reproduce clonally. This can produce groves that consist largely of groups (genets) of many genetically identical trees (ramets), often connected by roots. Trees are generally less than 15 m. Twigs are greenish white and glabrous. The winter buds are shiny. The leaf petiole is 2/3 to equal the blade length and is laterally compressed. The leaf blade is 2-4(7) cm, widely ovate or wider, with a rounded to cordate base, tapered tip, finely scalloped margin, glabrous green upper leaf surface, and glabrous glaucous lower leaf surface (Sawyer 1993).

A genetics study found that the two San Bernardino Mountains groves are nearly genetically identical to one another (Zona 1989).

Populus tremuloides is rare and highly localized on National Forest System lands in southern California (Thorne 1988). The Arrastre Creek grove begins leafing in April which is earlier than populations observed in the Sierra Nevada. Approximately two weeks later leafing, black splotches and fine white hairs have been observed on approximately one third of the trees, indicating the possible presence of a fungus (Jones 1989).

Habitat Description

Populus tremuloides occurs along streamsides, seeps, moist openings, and slopes in montane and subalpine forests and woodlands; it also occurs along streamsides in sagebrush steppe (Sawyer 1993). Across the main portion of its distribution, aspen is often an early seral stage species, taking advantage of openings caused by fire or other disturbance. It provides shelter for conifer seedlings, which eventually replace the aspen as the conifers grow taller and outshade them.

The Arrastre Creek aspen grove occurs along nearly 800 ft. of a seasonal watercourse in a narrow, relatively deep canyon. It is found mainly with xeric plants and endures a dry summer climate. Adjacent communities include sagebrush scrub, pinyon-juniper woodland, and lower yellow pine forest. Tree and shrub species associated with *Populus tremuloides* include *Salix scouleriana*, *Pinus jeffreyi*, *Pinus monophylla*, *Cercocarpus ledifolius*, and *Juniperus occidentalis*. The understory of the Arrastre Creek grove is dominated by *Poa fendleriana*. Other common understory species include *Artemisia* spp., *Carex* sp., *Galium* sp., *Eriophyllum lanatum*, and *Purshia glandulosa*. The largest *Populus tremuloides* trees were 10 inches in diameter in 1989. Burn scars were observed on the lower 15-20' of the largest trees, but younger trees lacked scars. The mean height of 61 sampled trees was 10.7 in 1989. Soils are coarse, gravelly to fine clayey sands interspersed with large cobbles and angular boulders. This grove is situated within a mile of an established camp. The grove is accessible by trail (Jones 1989).

The Fish Creek aspen grove occurs along a drainage in Jeffrey pine and subalpine forest (Jones 1989). The Fish Creek grove occurs on decomposed granitic soil on the canyon floor and side slopes at 7,000-7,600 ft (2,135-2,320 m) (Thorne 1988). At Fish Creek, associated species include *Pinus jeffreyi*, *Salix lasiolepis*, *Artemisia ludoviciana*, *Abies concolor*, *Calocedrus decurrens*, *Ribes* spp., *Castilleja miniata*,

and *Lupinus latifolius* (Jones 1989). Many of the conifers surrounding the grove are taller than the aspen trees, and it appears that conifers are out-shading them. This occurrence is located just within the San Gorgonio Wilderness boundary (USDA Forest Service 2003).

Occurrence Status

The two known occurrences on the SBNF are extant but may be declining.

The following table shows the recorded occurrences in/near the plan area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Populus tremuloides* (Quaking aspen)

Occurrence No.	No. of Plants	Year Reported	Location/Land Owner	County
*	estimated 300-658	1989	Arrastre Creek. Grove occupies ca. 0.74 acres (Jones 1989). SBNF-Broom Flats Candidate Research Natural Area.	SBD
*	U	U	Fish Creek. SBNF-San Gorgonio Wilderness.	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

The Arrastre Creek population is located within the Broom Flats candidate Research Natural Area, and the Fish Creek population is located within the San Gorgonio Wilderness. The wilderness area occurrence is somewhat protected from intensive Forest uses. Both the Arrastre Creek and Fish Creek aspen groves have been reduced in size in recent years. The Fish Creek grove has been reduced 25-50% since the introduction of beavers into the habitat. However, heavy beaver impacts were occurring in the early 1990s, but there have not been any recent reports on substantial beaver activity in either of the groves. Fungus is a potential threat to the long term viability of the aspen groves. Some aspen stands in the Rocky Mountains and Great Basin have been decimated from a fungus that caused widespread defoliation and subsequent tree death (Jones 1989).

Conservation and Management Considerations

The conservation strategy for this species is to monitor the status of these stands, and to identify and respond to threats to persistence. The following is a list of conservation practices that should be considered for *Populus tremuloides*:

- Monitor each of the two aspen stands at least once a year to identify threats. Respond with canopy thinning, fungal treatment, etc as needed and appropriate.
- Survey any new occurrences of *Populus tremuloides* and any occurrences that have not been visited in the past ten years (e.g. Axelrod's reported occurrence), and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Populus tremuloides* to document new occurrences or to verify a historical occurrence.
- Map known and new occurrences of *Populus tremuloides* in the area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Populus tremuloides is extremely rare and narrowly distributed within the plan area, but abundant elsewhere. The primary threats to this species are not caused by Forest Service management (e.g. fungus and habitat succession), although Forest Service Management should be effective at countering these threats.

Based on this analysis, *Populus tremuloides* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Populus tremuloides* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Populus tremuloides* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Potentilla glandulosa ssp. ewanii

Potentilla glandulosa Lindl. ssp. *ewanii* Keck (Ewan's cinquefoil)

Management Status

Federal: None

California: None

Heritage Rank: G5T1; S1.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Potentilla glandulosa ssp. *ewanii* occurs in the San Gabriel and San Bernardino Mountains of California (Ertter 1993).

Distribution in the Planning Area

The California Natural Diversity Database (2004) lists four occurrences of *Potentilla glandulosa* ssp. *ewanii*. All four of these occurrences are on the Angeles National Forest, in the Mt. Islip area of the San Gabriel Mountains. In 2004 an occurrence was found in Grout Creek in the San Bernardino Mountains.

Taxonomy and Natural History

Potentilla glandulosa ssp. *ewanii* is a dicotyledon in the rose family (Rosaceae). This species flowers between July-July (California Native Plant Society 2001). *Potentilla glandulosa* ssp. *ewanii* is a tufted plant from a loosely branched caudex that is sparsely glandular hairy. The stems are generally 5-20 cm and are sparsely glandular hairy. The leaves are pinnate. The basal leaves are 3-10 cm, with the sheathing base generally strigose. The terminal leaflet is the largest and generally 5-15 mm, with the lateral leaflet teeth < 10. The inflorescence is generally 2-30 flowered and the branches are angled at approximately 50 degrees. The hypanthium is 3-6 mm wide and the flower does not fully open. The petals are yellow, generally 3-4 mm, and approximately equal to the sepals. The filaments are 1-3.5 mm, and the anthers are 0.6 –1.2 mm. There are generally 25 pistils. The styles are 1-1.5mm, attached below the middle of the fruit, and generally fusiform and rough. Fruit are approximately 1mm, smooth or slightly ridged, and golden to reddish brown (Ertter 1993).

Habitat Description

Potentilla glandulosa ssp. *ewanii* grows on the edges of seeps or small waterways at elevations of 6,234-7,874 feet (1,900-2,400 meters).

Occurrence Status

Potentilla glandulosa ssp. *ewanii* is reported in California only from four occurrences in the San Gabriel Mountains and one occurrence in the San Bernardino Mountains. Only one of these has been documented in the past 10 years. Population trends for this species are unknown (California Natural Diversity Database 2004).

The following table shows the recorded occurrences in/near the area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA –*Potentilla glandulosa* ssp. *ewanii* (Ewan’s cinquefoil)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1996	Windy Spring on the north slope of Mt. Islip, San Gabriel Mountains. Drier margins of spring within a yellow pine forest.	LA
2	U	1996	Little Jimmy Spring, Windy Camp, north slope of Mt. Islip, San Gabriel Mountains. In spring seepage. Type locality. ANF	LA
3	U	1996	Highway 2. Between Dawson Saddle and Highway 39. About 1.6 miles from Dawson Saddle, San Gabriel Mountains. North west of Throop Peak near South Fork Big Rock Creek. Edge of montane chaparral thicket, near seep.	LA

4	U	1996	Along Highway 2 between Lodgepole picnic grounds and head of Dorr Canyon, San Gabriel Mountains. Growing along small watercourses, streams, damp places and springs within forest of PILA, PIPO, and <i>Abies</i> . Associated with <i>Aquilegia formosa</i> , <i>Mimulus moschatus</i> , and <i>Pedicularis semibarbatus</i> .	LA
615513 (RSA)	U	1968	San Gabriel Mtns.:Dorr Canyon at Angeles Crest Hwy (by Whitethorn picnic area). T3NR9W sec11. Elev. 7700 Ft. (Wheeler)	LA
636152 (RSA)	U	1974	Lily Springs area on N slope of Mt. Hawkins, drainage of S Fork Big Rock Creek; elevation ca. 8000 ft. ANF (Thorne)	LA
*	~5	2004	In Grout Creek, north of Gray's Peak in the San Bernardino Mountains. On sand bar on the banks of small streamcourse within yellow pine forest. Associated with <i>Hypericum formosum</i> , <i>Aquilegia formosa</i> , and <i>Thalictrum fendleri</i> . SBNF	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *RIV = Riverside County*
- *SBD = San Bernardino County*

Threats

On the Angeles National Forest, occurrences may be affected by dispersed recreation (trampling), trail maintenance, horticultural collecting and possibly herbivory (Nickerman pers. comm.). Water diversion

and extraction for snowmaking at three ski resorts are additional possible threats however more information is needed for confirmation of these unknowns.

On the San Bernardino National Forest, the occurrence is located less than 10m from a National Forest System dirt road which receives moderate to heavy use. Some of the possible threats associated with the road are increased likelihood of foot trampling, dust and trash pollution, and hydrological disturbances.

Conservation and Management Considerations

The primary conservation strategy for this species is to improve the knowledge of its distribution, to determine threats, and to protect occurrences as needed. The following is a list of conservation practices that should be considered for *Potentilla glandulosa* ssp. *ewanii*:

- Survey CNDDDB occurrence nos. 1, 2, 3, and 4 to determine whether *Potentilla glandulosa* ssp. *ewanii* is still extant at these locations and to assess current threats.
- Survey all new occurrences of *Potentilla glandulosa* ssp. *ewanii* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Potentilla glandulosa* ssp. *ewanii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Potentilla glandulosa* ssp. *ewanii* on NFS lands using National Resource Inventory System data collection standards, and incorporate these occurrences into the corporate GIS database.

Evaluation of Current Situation and Threats on National Forest System Lands

Potentilla glandulosa ssp. *ewanii* is narrowly distributed. While some of the recorded occurrences may be vulnerable to potential threats, these impacts are not expected to be substantial nor widespread across available habitat. Riparian management also provides a level of protection.

Based on this analysis, *Potentilla glandulosa* ssp. *ewanii* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Potentilla glandulosa* ssp. *ewanii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Potentilla glandulosa* ssp. *ewanii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Populus tremuloides

Potentilla rimicola

Potentilla rimicola

Potentilla rimicola (Munz & I.M. Johnston) B. Ertter (Cliff cinquefoil)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2G4; S1.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 3-1-1

General Distribution

Potentilla rimicola occurs in the San Jacinto Mountains in California and the Sierra San Pedro Martir in Baja California Norte, Mexico (Ertter 1993).

Distribution in the Planning Area

The California Natural Diversity Database (2004) lists five historical occurrences of *Potentilla rimicola* and one recent (1987) collection. Five occurrences are on the San Bernardino National Forest; one is in the adjacent Mt. San Jacinto State Park.

Taxonomy and Natural History

Potentilla rimicola is a dicotyledon in the rose family (Rosaceae). This species flowers between July-September (California Native Plant Society 2001). *Potentilla rimicola* is a hanging, taprooted plant that is more or less glandular. The stems are generally 5-20 cm and are spreading- to ascending-hairy. The leaves are palmate. The basal leaves are 2-4 cm with five leaflets. The central leaflet is 10-30 mm, more or less obovate, the distal 1/3 is few-toothed more or less 1/4 to the midvein, and more or less strigose. The inflorescence is generally 5-20-flowered. The pedicels are generally greater than 15 mm and are often recurved in fruit. The hypanthium is 2-3 mm wide. The petals are generally 4-7 mm. The filaments are 1-2.5 mm, and the anthers are 0.5-1 mm. There are generally 5-20 pistils, and the styles are 1.5-2.5 mm and slender. Fruit are approximately 1.5 mm, more or less smooth, and red-tipped (Ertter 1993).

Habitat Description

Potentilla rimicola grows in granitic crevices in outcroppings and cliff faces within upper montane and subalpine coniferous forest at elevations of 7,900-9,200 feet (2,400-2,800 meters).

Occurrence Status

Potentilla rimicola is reported in California only from five occurrences in the San Jacinto Mountains. Only one of these has been documented recently. Population trends for this species are unknown (California Natural Diversity Database 2004).

The following table shows the recorded occurrences in/near the area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Potentilla rimicola* (Cliff cinquefoil)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1987	Head of Andreas Canyon, N side of Red Tahquitz Peak, San Jacinto Mountains. Steep ridge of decomposing granite within scattered <i>Pinus lambertiana</i> and <i>P. jeffreyi</i> . Growing with <i>Ivesia callida</i> . San Jacinto Wilderness. SBNF.	RIV
2	U	1908	Summit of Tahquitz Peak, San Jacinto Mountains. San Jacinto Wilderness. SBNF.	RIV
3	U	U	Dark Canyon, San Jacinto Mountains. Type locality. SBNF.	RIV
4	U	1924	0.5 mi. W of Deer Spring, San Jacinto Mountains. Crevices in rock pinnacle. SBNF.	RIV

5	U	1929	Mt. San Jacinto. Granite ledges. Mt. San Jacinto State Park.	RIV
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- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *RIV = Riverside County*

Threats

Occurrences in the San Jacinto Wilderness Area are protected from many land uses by the wilderness designation of this area; however, some plants may be affected by rock-climbing activities (USDA Forest Service 2003). Rock climbing impacts from outfitter guides and groups are analyzed at the project level prior to issuance of a special use permit.

Conservation and Management Considerations

The primary conservation strategy for this species is to improve the knowledge of its distribution, to determine whether rockclimbing is impacting this species, and to protect occurrences as needed. The following is a list of conservation practices that should be considered for *Potentilla rimicola*:

- Survey CNDDDB occurrence nos. 2, 3, and 4 to determine whether *Potentilla rimicola* is still extant at these locations and to assess current threats.
- Survey all new occurrences of *Potentilla rimicola* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Survey all popular climbing routes in suitable habitat within the range of this species. Where impacts to this species are observed, implement protective measures as needed.
- Collect a herbarium voucher specimen of *Potentilla rimicola* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Potentilla rimicola* in the plan area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Potentilla rimicola is extremely rare and narrowly distributed. While some of the recorded occurrences may be vulnerable to identified threats (primarily rockclimbing), these impacts are not expected to be widespread across available habitat. Where impacts are detected, protective measures are recommended. Most of the suitable habitat for this species is inaccessible except through technical climbing, and most is in established wilderness.

Based on this analysis, *Potentilla rimicola* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Potentilla rimicola is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Potentilla rimicola* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Potentilla rimicola* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Potentilla glandulosa ssp. ewanii	Pyrrcoma uniflora var. gossypina
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Pyrrcoma uniflora var. gossypina

Pyrrcoma uniflora (Hook.) Greene var. *gossypina* (Greene) Kartesz & Gandhi (Bear Valley pyrrcoma)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G5T2; S2.2 (California Natural Diversity Database)

California Native Plant Society - List 1B; R-E-D Code 2-2-3 (California Native Plant Society 2001).

General Distribution

Pyrrcoma uniflora var. *gossypina* is endemic to the Big Bear and Holcomb valleys in the San Bernardino Mountains in San Bernardino County. Occurrence locations include Erwin Lake, Baldwin Lake, Arrastre Flat, Holcomb Valley, the south shore of Big Bear Lake, and the Big Bear City Airport (California Natural Diversity Database 2004). It is also known from Belleville Meadow (USDA Forest Service 2003).

Distribution in the Planning Area

Seven occurrences of *Pyrrcoma uniflora* var. *gossypina* are reported from the San Bernardino National Forest, in Arrastre Flat, the western and northern portions of Holcomb Valley, and on the south shore of Big Bear Lake near Pineknott and Coldbrook Campground.

Taxonomy and Natural History

Pyrrcoma uniflora var. *gossypina* is a dicotyledonous perennial with woolly-tufted herbage in the sunflower family (*Asteraceae*). Stems are generally 7-38 cm long, and leaves are woolly, basal, 3-12 cm long, oblanceolate, and sharply dentate to cut. There are a few cauline leaves that are clasping and reduced. There are 1-4 heads in a raceme-like cluster, and involucre are 10-13 cm with unequal linear phyllaries. The taxon has between 25 and 45 ray flowers, with 7-11 mm long ligules. Between 35 and 60 disk flowers are present, each with corollas that are 5-8 mm long. The fruit is more or less 3-4 mm

long, 3-4-angled and silky, with pappus that is more or less 5-8 mm long and tan. Flowering occurs in late summer months (Brown 1993).

Habitat Description

Pyrrocoma uniflora var. *gossypina* occurs in clay soils on the edges of alkaline meadows, streams and seeps in Big Bear and Holcomb valleys between 6,700 and 7,500 feet in elevation (Brown 1993). The plant may also be found in the ecotone between pebble plains and meadows. Both pebble plains and meadows are rare habitats on the SBNF and are threatened by a variety of Forest uses, including hydrological alteration, non-native species invasion, soil compaction, grazing, development projects and high levels of recreation use (USDA Forest Service 2002).

In meadows and on meadow margins, *Pyrrocoma uniflora* var. *gossypina* may be associated with *Carex praegracilis*, *Distichlis spicata*, *Juncus balticus*, *Castilleja lasiorhyncha*, *Packera bernardina*, *Mimulus exiguus*, and *Perideridia parishii* ssp. *parishii*. On pebble plain margins, *Pyrrocoma uniflora* var. *gossypina* may occur with *Phlox dolichantha* and *Ivesia argyrocoma*. Several listed species also co-occur with this taxon in meadows and pebble plains, including *Thelypodium stenopetalum*, *Taraxacum californicum*, *Poa atropurpurea*, and *Sidalcea pedata* (federally Endangered), and *Castilleja cinerea* (federally Threatened) (California Natural Diversity Database 2004; USDA Forest Service 2002).

Occurrence Status

There are 12 occurrences of *Pyrrocoma uniflora* var. *gossypina* recorded in the CNDDDB (California Natural Diversity Database 2004). Although abundance information is unknown for six of the 12 known occurrences, it appears that *Pyrrocoma uniflora* var. *gossypina* is declining due to habitat loss and degradation throughout its range. The largest recorded occurrence of the taxon was found in Arrastre Flat (occ. no. 6) and contained 4,000 individuals at the time of survey (California Natural Diversity Database 2004). However, other occurrences around Baldwin Lake and the south shore of Big Bear Lake had 200 or fewer individuals at the time of survey. Several occurrences were recorded more than 20 years ago, and these occurrences should be relocated and surveyed to obtain current abundance and trend information.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Pyrrocoma uniflora* var. *gossypina* (Bear Valley pyrrocoma)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1 20073 (UCR)	60 U	1979 1979	Big Bear City Airport, near entrance, bounded by Kiener Dr. and Fairway Blvd. Nearly extirpated. Plowed and nonnative plants present. PVT // Big Bear rd. vacant meadow outside the fence if Big Bear City Airport	SBD
2	U	1979	SW edge Baldwin Lake, near Pan Hot Springs, s of Hwy 18. PVT	SBD
3 UCR130796 (SMASCH)	70 U	1979 1999	S shore of Baldwin Lake, N of Shay Rd. PVT S side of Baldwin Lake, Palomino Dr. ca. ¼ mi. N of Shay Rd. at entrance to wastewater treatment facility, proposed expansion area. T02N/R02E/S07(Sanders/ CalFlora)	SBD
4	35	1979	E shore of Baldwin Lake. PVT	SBD
5	U	1984	Erwin Lake, Unit # 15 of Big Bear Valley Preserve System. PVT	SBD
6	4,000	1979	Arrastre Flat, along banks of annual stream crossing, west edge of meadow. SBNF	SBD
7	U	1988	W Holcomb Valley, opposite Hitchcock Ranch. SBNF, PVT	SBD
8	U	1988	Eagle Pt, from N of Swan Dr. to Lake shore. /PVT	SBD

9	200	1984, 2001	Coldbrook Campground north to Presbyterian Conference Grounds, south of Big Bear Lake. Continued closure of campground provides adequate protection in 2001 (Ward). SBNF	SBD
10	20	1979	Just S of Lakeview Dr. near Canvasback, S of Big Bear Lake. PVT	SBD
11	U	1937	Pineknot, Bear Valley. SBNF	SBD
13	U	1984	Upper Holcomb Valley in wet meadow and Van Dusen pebble plains. SBNF	SBD
*	U	U	Broom Flat	SBD
*	U	U	Metcalf Bay meadow	SBD
*	U	2001	Adjacent to Holcomb Valley Campground, between campground and north to Forest Road 3N05. Occurs with <i>Castilleja lasiorenchyna</i> , <i>Packera bernardinus</i> , <i>Castilleja cinerea</i> . Habitat impacts from dispersed use off designated trails adjacent to campground observed in 2000. In 2001, trails were rerouted, fences and signing installed to redirect use out of habitat as many rare plants present. Population is not fenced however redirection of use is effective in habitat protection as of 2003 (Kopp) SBNF	SBD

*	U	U	Belleville Meadow, associate species with <i>Thelypodium stenopetalum</i> . Survey documentation listing <i>Pyrrocoma</i> in Belleville, Pan Hot Springs, Eagle Point meadows SBNF	SBD
342035 (RSA)	U	1979	Holcomb Valley; Holcomb Creek, W of Hitchcock Ranch on 3N12; elev. 7150 ft.	SBD
1743105 (CalFlora)	U	1993	Western Riverside County; from base of San Jacinto Mts. West. (Lum/Munz68, CalFlora/Jm93)	RIV
UC1436877 (SMASCH)	U	1976	Coldbrook campground near sw corner of 2N10 and Tulip lane, in San Bernardino Mts. (Derby/CalFlora)	SBD
UCSB22020 (SMASCH)	U	1968	San Bernardino Mts., Arrastre Flats of Holcolm Valley in alkaline soil.	SBD
UCR20183 (SMASCH)	U	1979	Arrastre flat, W edge of meadow opening, Sargossa quartzite-clay pavement soil (Krantz/CalFlora)	
UCR20182 (SMASCH)	U	1978	San Bernardino Mts., W Holcomb Valley meadow across from Hitchcock ranch, along annual streams and springs draining N. T02N/R01E/S31 (Krantz/CalFlora)	SBD
UCR20072 (SMASCH)	U	1979	San Bernardino Mts., small meadow N of jct. Oriole and Swan Drives, Eagle Point, Lat:34.2502777/Lon:-116.9002777 (Krantz/CalFlora)	SBD

UCR31190 (SMASCH)	U	1983	San Bernardino Mts., vacant lot, Bonanza Trail, N of Big Bear Blvd., Big Bear Lake (Krantz/CalFlora)	SBD
UCR54633 (SMASCH)	U	1986	San Bernardino mts., Prestige Pt. At Big Bear Lake (Krantz/CalFlora)	SBD
UCR139264 (SMASCH)	U	2001	San Bernardino Mts., Alden Rd., E. side of rd. near a trailer park, S. side of Big Bear Lake, flat on SE side of a hill; yellow pine forest on old lake sediments, Lat: 34.234444/ Lon: -116.900555	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *PVT = Privately-owned – non-USFS property*

Threats

Within the Planning Area, *Pyrrcoma uniflora* var. *gossypina* is threatened by horse grazing, trampling from horses, mountain bikes, and vehicle use off designated roads, increased soil salinity in meadows, competition from nonnative plants, soil compaction and dispersed recreation (California Natural Diversity Database 2002, Stephenson and Calcarone 1999). The primary threat on private land is residential and commercial development.

Conservation and Management Considerations

The following list of conservation practices should be considered for *Pyrrcoma uniflora* var. *gossypina*:

- Implement strategies in the Meadow and Pebble Plain Habitat Management Guides to the greatest extent practicable.
- Locate occurrences at Pineknot and Broom Flat to document if measures completed to protect listed species or rare habitats in this location are effective in protection of *Pyrrcoma uniflora* var. *gossypina*. Implement measures as necessary.
- To ensure documentation of this species is completed during meadow surveys, ensure botanical surveyors are able to recognize this species in vegetative state.
- Survey all new occurrences of *Pyrrcoma uniflora* var. *gossypina* and any occurrences that have

- not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Pyrocoma uniflora* var. *gossypina* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Pyrocoma uniflora* var. *gossypina* in the area using NRIS data collection standards, and incorporate these occurrences into the corporate database.

Evaluation of Current Situation and Threats on National Forest System Lands

Pyrocoma uniflora var. *gossypina* is considered to have high vulnerability on National Forest system lands (Stephenson and Calcarone 1999) because it 1) is endemic to the Big Bear area, 2) is restricted to montane meadows and edges of pebble plain habitat, both rare habitat types, 3) is known from a limited number of locations, 4) is present within a high use recreation area, and 5) is affected by changes in hydrological regimes. Habitat protection measures implemented in 2001 adjacent to Holcomb Valley Campground have been effective in redirecting use out of habitat (Stamer pers. comm.). The occurrence at Coldbrook Campground is protected at this time by non-use of campground. The Arrastre Flat and occurrence west of Hitchcock Ranch are protected from off road driving by fence lines that are monitored and repaired regularly. Special use events that degraded habitat in Arrastre Flat were removed from this location in the early 1990's. Plants present within Belleville Meadow may be within mining claims; however an analysis would be completed prior to issuance of a Plan of Operation. It is possible plants could be affected by prospecting however. Locations at Pine Knot and Broom Flat have not been observed in recent years, threats to this species if they are present are unknown at this time. This species is predicted to occur in more locations than currently mapped, as it flowers later in the season after most meadow species surveys are conducted. However, because extensive meadow surveys have been conducted in the Big Bear area and this species is not well documented in survey reports, it may be that this species is rarer than currently described (personal observation Kopp).

Based on the above analysis, *Pyrocoma uniflora* var. *gossypina* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	C	B	C	A

Pyrrocoma uniflora var. *gossypina* is a USDA, Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Many occurrences of this plant co-occur with federally listed meadow and pebble plain plants. In these locations, habitat for this species is currently protected and will continue to receive protection. Consideration of the Suitable Use restricting motorized and mechanized vehicle travel to designated Forest transportation system roads and trails, along with Standards for rare species management, riparian management, recreation, ground water extraction, and mining factor in to the outcomes as does implementation of actions listed in the SBNF Meadow and Pebble Plain Habitat Management Guides. To provide for viability of this species, some of the most important habitat for this species must be clearly and substantially protected.

Under all alternatives, occurrences of this taxon in Belleville Meadow would continue to be managed within the existing Baldwin Lake/Holcomb Valley Special Interest Area established for rare biological resources. Under Alternatives 2-6 Standard S33 would protect occurrences to a higher degree when new projects are proposed within the SIA. Under Alternative 1, protection measures and monitoring of these measures within listed plant habitat would remain in place under this alternative and *Pyrrocoma uniflora* var. *gossypina* habitat would benefit from this.

Under Alternatives 2, 3, 4a and 6, the Arrastre Flat occurrence would be managed as the Arrastre Research Natural Area. This would add substantial protection to the largest recorded occurrence of the taxon, which contained 4,000 individuals at the time of survey (California Natural Diversity Database 2002).

Under Alternative 4, the Arrastre Flat RNA would not be recommended for establishment. Due to the fact that the largest occurrence is found within this area, this taxon would be at higher risk under this alternative.

Under Alternative 5, there are no special area designations recommended. Under this alternative, there would be increased threats across the range of the species as a result of an increase in road and trail designation, use and additional water diversions/extractions and lack of protection within new special designations.

A higher level of protection would occur under Alternative 6, than in the current situation as habitat in the Broom Flat area changed from Backcountry Motorized to Backcountry Non-Motorized zoning. Recovery of this species would be expected to occur sooner under Alternatives 3 and 6 due to the emphasis on protecting ecological integrity.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	B	C	C	C	B

Occurrences in meadows on private land within Big Bear Valley are being rapidly lost to development, and alteration and groundwater extractions are on the rise. Degradation from horse grazing may also be affecting occurrences. Some occurrences on private land may be lost over time. By maintaining the current distribution of *Pyrrocoma uniflora* var. *gossypina* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this species to suffer a decline in its overall distribution.

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Personal communication

Stamer, Linda. Biologist, San Bernardino National Forest. [Personal communication with Deveree Kopp, Mountaintop District Botanist, San Bernardino National Forest.] 23 October 2003.

Potentilla rimicola

Quercus dumosa

Quercus dumosa

Quercus dumosa Nutt. (Nuttal's scrub oak)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: None

Heritage Rank: G2, S1.1 – very threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-3-2

General Distribution

Quercus dumosa occurs in coastal areas of southern Santa Barbara, Orange, and San Diego Counties and northwestern Baja California (Roberts 1995, California Native Plant Society 2001).

Distribution in the Planning Area

One occurrence of *Quercus dumosa* has been previously reported from the Los Padres National Forest (Stephenson and Calcarone 1999). The location of this occurrence at an elevation of over 2,500 feet calls into question the taxonomy of the plants here and it is suspected that the oaks at this location are likely to be *Q. berberidifolia*. Two other occurrences, both north of Carpinteria in Santa Barbara County, are adjacent to the Los Padres National Forest; one of these is on land managed by the Santa Barbara Botanic Garden (Stephenson and Calcarone 1999, California Natural Diversity Database 2004) and this population consists of just 3 plants (Painter 2004). A third population of *Quercus dumosa* is located in Mission Canyon just above the town of Santa Barbara. There are no verified locations of *Quercus dumosa* on the Los Padres National Forest.

Taxonomy and Natural History

Quercus dumosa is a dicot in the oak family (Fagaceae). It belongs to the white oak group (subgenus *Lepidobalanus*), characterized by acorns that mature in 1 year. *Quercus dumosa* is very similar to scrub oak (*Q. berberidifolia*), and the two species hybridize (Hickman 1993). The two species have been confused in the past (Roberts 1995) but can be distinguished by acorn characteristics as well as by the

presence of obvious hairs on the lower leaf surface, which are lacking in *Q. berberidifolia* (Roberts 1995). Hybrids are also known with Engelmann's oak (*Q. engelmannii*), and hybrids of Nuttall's scrub oak and valley oak (*Q. lobata*) in the Santa Ynez Mountains have been named *Quercus x kinselae* (Roberts 1995).

Quercus dumosa is an evergreen shrub that flowers February–April (California Native Plant Society 2001). The male flowers are arranged in short catkins or clusters and produce wind-borne pollen. The acorn matures in 1 year (Roberts 1995).

Habitat Description

Quercus dumosa grows on coastal sandy and clay loam soils in closed-cone coniferous forest, chaparral, coastal sage scrub, and maritime succulent scrub at elevations up to 1,350 feet (400 meters) (California Native Plant Society 2001). In Santa Barbara County, *Quercus dumosa* is typically found below an elevation of 800 feet.

Occurrence Status

Within its limited range *Quercus dumosa* can be common (Roberts 1995).

Threats

Quercus dumosa is not known to occur on National Forest System lands at this time and is thus not threatened by Forest Service actions or programs. Some occurrences on private land are at risk from development projects and fuels modification activities such as mechanical thinning, spring burning, and fire suppression (Stephenson and Calcarone 1999). Another risk is hybridization with *Quercus berberidifolia*.

Conservation and Management Considerations

Not applicable for National Forest System land.

Evaluation of Current Situation and Threats on National Forest System Lands

Quercus dumosa is not known to occur on National Forest System lands but the presence of known locations adjacent to the Los Padres National Forest suggests that potential habitat may be present on the Santa Barbara Ranger District of the Los Padres National Forest.

Based upon the above analysis *Quercus dumosa* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

Quercus dumosa is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

No populations of *Quercus dumosa* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Quercus dumosa*.

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**Pyrrcoma uniflora var.
gossypina**

Quercus engelmannii

Quercus engelmannii

Quercus engelmannii Greene (Engelmann oak)

Management Status

Federal: None

California: None

Heritage Rank: G3, S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-2

General Distribution

Quercus engelmannii (Engelmann oak) woodlands are distributed from the San Gabriel Mountains south to Baja California, Mexico; however, most occur in the foothills of San Diego and southwestern Riverside counties (Stephenson and Calcarone 1999). An isolated population also occurs on Santa Catalina Island (Tucker 1993; California Native Plant Society 2001).

Distribution in the Planning Area

Quercus engelmannii occurs on National Forest System lands on the Angeles and Cleveland National Forests (CalFlora 2000).

Taxonomy and Natural History

Quercus engelmannii is a deciduous tree (16 – 60 feet) that blooms March–May (California Native Plant Society 2001). Trunk grayish bark becomes narrowly furrowed and scaly, while young twigs tend to be finely tomentose becoming glabrous with maturity. Oblong to obovate leaves (2-6 cm) with petiole (3-7 mm) have a dull bluish green upper surface and a pale blue-green lower surface that is soft-hairy when young, becoming glabrous with age. Margins of the obtuse to round tipped leaves of *Quercus engelmannii* are generally entire or wavy, sometimes toothed. Fruit matures in 1-year, producing an oblong-cylindric nut (15- 25 mm) with round to obtuse tip and glabrous shell interior. Cap (10-15 mm wide by 6-8 mm deep) cup- to bowl-shaped, scaled, tubercled or not (Tucker 1993).

This species is the only representative of subtropical white oaks in California and represents the

northwestern extent of their range. There are no other subspecies or varieties of this species. It can hybridize with scrub oak (*Quercus berberidifolia*) and Muller's oak (*Quercus cornelius-mulleri*) (Tucker 1993).

Habitat Description

Quercus engelmannii is found at elevations of 160–4,500 feet (50–1,387 meters). It is the dominant species in Engelmann oak woodland and is a canopy species in grassland/oak savanna or chaparral and within riparian corridors along raised stream terraces (Sawyer and Keeler-Wolf 1995). *Quercus engelmannii* trees commonly form open savanna (less than 10% canopy closure) and woodlands (greater than 10% canopy closure) with grassland understories. In riparian areas the species can occur in dense stands with other hardwoods (Holland 1986). Some of the most successful stands of *Quercus engelmannii* grow on clay soils formed from a gabbro or basalt substrate. The species is sometimes found on rocky, north-facing slopes with an understory of coastal sage scrub or chaparral (Stephenson and Calcarone 1999).

Occurrence Status

Quercus engelmannii occurs on or adjacent to the Angeles National Forest in the southern San Gabriel foothills near Pasadena, in the canyons on the south slopes of Mount Wilson, and near San Dimas (CalFlora 2000). The greatest concentrations of *Quercus engelmannii* woodland are found in the foothills of San Diego County between Palomar Mountain and Cuyamaca Peak, on or adjacent to the Cleveland National Forest. Another major occurrence on or adjacent to the Cleveland National Forest is located on the Santa Rosa Plateau on the southeastern flank of the Santa Ana Mountains (Stephenson and Calcarone 1999).

Threats

This tree species inhabits the smallest natural range of any oak species in California and is located next to the fastest growing urban landscape in the country (Stephenson and Calcarone 1999). The California Native Plant Society (2001) considers the species to be endangered in a portion of its range, but widely enough distributed that it is not in danger of extinction at this time.

Conservation and Management Considerations

The primary management concern for *Quercus engelmannii* woodlands on public lands is maintaining sufficient regeneration. The long-term viability of *Quercus engelmannii* appears to be hampered by sporadic regeneration combined with unnatural rates of disturbance. There is a noticeable absence of young trees in many woodlands. Livestock grazing, deer browsing, acorn herbivory by small mammals and birds, and competition for soil moisture from introduced annual grasses all appear to contribute to low recruitment rates for the species (Reiser 1994; Stephenson and Calcarone 1999).

Recent research has investigated the impacts of prescribed fire on seedling and sapling *Quercus engelmannii* at the Santa Rosa Plateau, because prescribed fire has been a useful tool for reducing the proportion of non-native annual grasses in grassland vegetation there. *Quercus engelmannii* seedlings suffered higher mortality from fires than did saplings, but survival after fire was a complex function of fire damage, size, and location with respect to the canopy of the nearest adult oak (Principe and others 2002). Burning and mowing both enhanced seedling emergence, but mowing had the greatest positive effect (Principe 2002). High rainfall appears to be necessary for new seedlings to establish (Principe and others 2002). Principe (2002) concluded that it might be difficult to use fire to enhance *Quercus engelmannii* woodlands because recruitment is such a complex function of local fire intensity, individual plant size, and other environmental factors.

Encouraging private landholders to protect this species on their properties is the key to long-term conservation of *Quercus engelmannii* (Stephenson and Calcarone 1999). In recent years, major progress has been made in conserving this species through the purchase of key areas by Riverside County (on the Santa Rosa Plateau), San Diego County (on Vulcan Mountain), Caltrans, and the Cleveland National Forest (Roberts and Rutherford Ranches) (Stephenson and Calcarone 1999).

The following is a list of conservation practices that should be considered for the *Quercus engelmannii*:

- It is important for public land management agencies to pursue acquisition of lands containing *Quercus engelmannii* when they come up for sale.
- Strategic use of prescribed fire to reduce density of non-native annual grasses in *Quercus engelmannii* woodlands experiments would need to be monitored closely.
- More information is needed in terms of population status and trends.

Evaluation of Current Situation and Threats on National Forest System Lands

Quercus engelmannii occurs in limited areas on the Angeles and Cleveland national forests. Although sapling regeneration in most stands of this species is poor, the reasons for poor regeneration are complex and not completely understood. Forest Service activities do not appear to pose a particular risk to this species. Strategic use of prescribed fire to reduce density of nonnative annual grasses in *Quercus engelmannii* woodlands could contribute to increased regeneration, although any such experiments would need to be monitored closely.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon and peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Quercus engelmannii is considered to have low to moderate vulnerability on National Forest System

lands. Populations of *Quercus engelmannii* occurring on National Forest System lands are well protected. However, recent precipitation trends, fire events, and livestock grazing may be negatively impacting this species (Principe 2002, Reiser 1994, Stephenson and Calcarone 1999).

The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Quercus engelmannii*. Variations in land use designations would not alter this current situation and the various emphases of the alternatives would not result in a substantial change in conditions for *Quercus engelmannii*. *Quercus engelmannii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

Quercus engelmannii is considered to have low to moderate vulnerability across its range. Although populations on federal and state lands are well protected, the total extent of *Quercus engelmannii* woodland is declining due to habitat loss on private lands (USDA Forest Service 1998, Stephenson and Calcarone 1999). By maintaining the current distribution of *Quercus engelmannii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Quercus engelmannii* to suffer a decline in its overall distribution.

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Quercus dumosa

Quercus lobata

Quercus lobata

Quercus lobata Nee (Valley oak)

Management Status

Federal: None

California: None

Heritage Rank: not listed (California Natural Diversity Database)

California Native Plant Society (2001): considered but rejected: too common

General Distribution

Valley oak (*Quercus lobata*) is endemic to California, occurring in the Coast Ranges, Sierra Nevada foothills, and Central Valley from Tehama County south, and reaching its southern limit in the San Fernando and Santa Clarita Valleys and the Santa Monica Mountains in Los Angeles County (Griffin and Critchfield 1972, Pavlik and others 1991). Valley oak forms extensive woodlands, particularly in the Central Valley. In the South Coast Ranges, valley oak is a minor component of several plant communities (Griffin and Critchfield 1972).

Distribution in the Planning Area

Valley oak woodlands occur on the northern portion of Los Padres National Forest (e.g., Wagon Caves candidate Research Natural Area) (Stephenson and Calcarone 1999). Valley oak also occurs in oak savanna, an open woodland community with a grass-dominated understory. Oak savanna is often the dominant plant community in the broad valleys surrounding the mountains of Santa Barbara, San Luis Obispo, and Monterey Counties on or adjacent to the Los Padres National Forest. Valley oak is abundant at low elevations in the Santa Lucia Ranges and extends into portions of the southern Los Padres and Castaic regions and the northern flank of the San Gabriel Mountains (Griffin and Critchfield 1972, Tucker 1993).

Taxonomy and Natural History

Valley oak is a dicot in the oak family (Fagaceae). It belongs to the white oak group (subgenus *Lepidobalanus*), characterized by acorns that mature in 1 year. Valley oak hybridizes with six other

species of white oaks, both shrubs and trees (Tucker 1993, Roberts 1995). Hybrids between valley oak and Nuttall's scrub oak (*Quercus dumosa*), a USDA Forest Service Region 5 Sensitive Species and California Native Plant Society List 1B species, have been named *Quercus x kinselae* and are found in the Santa Inez Mountains (Roberts 1995).

Valley oak is a deciduous tree that can reach heights of 40-50 feet (12-15 meters) in southern California (Roberts 1995) and up to 115 feet (35 meters) further north (Hickman 1993). The male flowers are arranged in long catkins that produce wind-borne pollen from March to April, and the acorns mature in 1 year (Roberts 1995).

Habitat Description

Valley oak typically occurs on deep alluvial soils of valley floors and in lower foothill communities where there are deep soils (Stephenson and Calcarone 1999). Valley oak also extends up mountain slopes, reaching 5,000 feet (1,525 meters) on Chews Ridge in the northern Santa Lucia Range and 5,600 feet (1,700 meters) in the Tehachapi Mountains. Valley oak grows on intermittently flooded or seasonally saturated soils in valley floors and on alluvial or residual soils on slopes (Sawyer and Keeler-Wolf 1995).

Occurrence Status

In the central and south coast bioregions, an estimated 680 acres (275 hectares) of valley oak woodland occur on National Forest System lands, representing only 8 percent of the total extent of this community (Stephenson and Calcarone 1999). More detailed mapping is needed to quantify the exact amount. On private lands along the central coast, rapid expansion of agriculture and urban development is seriously reducing the amount of valley oak woodlands (Stephenson and Calcarone 1999). In Santa Barbara County in particular, vineyards are encroaching on valley and foothill oak woodlands.

Threats

Seedling regeneration of valley oak is low and may jeopardize the long-term viability of valley oak woodlands; many stands are reported to lack trees younger than 75-125 years (Pavlik and others 1991). Factors cited as contributing to the scarcity of regeneration include livestock browsing of acorns and seedlings, soil cultivation around mature trees, lowering of the water table caused by groundwater pumping, and competition from nonnative grasses (Stephenson and Calcarone 1999). Nonnative annual grasses compete more vigorously than native perennial grasses for available soil moisture, thereby depleting soil moisture more rapidly: in experiments, oak seedlings grown with native perennial grass were larger and had lower mortality than seedlings grown with nonnative annual wild oats (*Avena fatua*) (Danielsen and Halvorson 1991).

Conservation and Management Considerations

Map the extent of valley oak on National Forest System lands and determine the age structure of individual stands.

Evaluation of Current Situation and Threats on National Forest System Lands

Impacts to Valley oak from activities conducted on National Forest System lands are being mitigated through the use of grazing utilization standards and through the designation of valley oak as a management indicator species. The current distribution and abundance of valley oak is not expected to decline on National Forest System lands.

Based upon the above analysis valley oak has been assigned the following threat category:

4. Uncommon, disjunct, or peripheral in plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Quercus lobata* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Quercus lobata* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Quercus engelmannii

Ribes canthariforme

Ribes canthariforme

Ribes canthariforme Wiggins (Moreno currant)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G1, S1.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B R-E-D Code 3-1-3

General Distribution

Ribes canthariforme, Moreno currant, is endemic to the foothills of the Peninsular Ranges in southwest San Diego County (Mesler & Sawyer 1993). The California Natural Diversity Database lists 16 occurrences, many consisting of only a few plants that are located on state or federal lands (California Natural Diversity Database 2004).

Distribution in the Planning Area

Eight *Ribes canthariforme* occurrences are reported to be on the Cleveland National Forest, most being located in the mountains of the Descanso Ranger District (California Natural Diversity Database 2004).

Taxonomy and Natural History

Ribes canthariforme is a deciduous shrub in the gooseberry family (Grossulariaceae) that blooms February–April (California Native Plant Society 2001). It is distinguished from similar congeners by floral characters (Mesler & Sawyer 1993). Dense inflorescences are many flowered and spike- or head-like. Hypanthium (1 mm) is wider than long; purple sepals with darker veins are spoon-shaped, 2 mm; styles free to sparsely hairy at base. Purple fruit (5 to 6 mm) with long, soft, wavy hairs or glandular, 0 in age (Mesler & Sawyer 1993).

Habitat Description

Ribes canthariforme occurs in small riparian pockets of chaparral associated with gabbro soils and large granite boulders (Stephenson and Calcarone 1999). Water availability may be higher in the shadows of these large boulders; this condition may help explain the microhabitat requirements for this species (Reiser 1994).

Occurrence Status

California Natural Diversity Database reports 16 occurrences for *Ribes canthariforme*. Half of these occurrences are from Cleveland National Forest and half are located in private land holdings (California Natural Diversity Database 2004).

OCCURRENCE DATA of *Ribes canthariforme* (Moreno current) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
10	2-1	U	1927	Morena Reservoir / CNF	SD
10	2-2	U	1936	Morena Reservoir / CNF	SD
*	2-3	U	1964	El Cajon Mountain / CNF	SD
*	2-4	U	1941	Morena Butte / CNF	SD
*	2-5	U	1979	Lawson Peak / CNF	SD
9	2-6	U	U	Lyons Peak / CNF	SD
3	2-7	U	1937	Descanso Junction / CNF	SD
8	2-8	U	U	Lawson Peak / CNF	SD
13	2-9	25	1994	El Cajon Mountain / CNF	SD

12	2-10	2	1993	El Cajon Mountain / CNF	SD
*	2-12	U	1991	Corte Madera Mountain / CNF	SD
11	2-13	1	1996	Skye Valley Road / CNF	SD
14	2-14	20	2001	Lawson Peak / CNF	SD

- U = Unknown.
- * = an occurrence number has not been assigned.
- CNF = Cleveland National Forest
- SD = San Diego County

Threats

Threats to populations of *Ribes canthariforme* on National Forest land include potential damage for the populations near Corral Canyon OHV use area and a popular shooting area at Lawson Peak (California Natural Diversity Database 2004). Naturally small population sizes may contribute to the decline of this species in the future.

Conservation and Management Considerations

The distribution of *Ribes canthariforme* is moderately to highly well known on National Forest System lands, where population trends are stable (Stephenson and Calcarone 1999).

The following is a list of conservation practices that should be considered for *Ribes canthariforme*:

- No more than 5% of any Forest population may be affected by ground-disturbing activities.
- Monitor and map all habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Species Atlas.
- Survey for additional locations in potential habitat.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Do not protect from fire. Minimize earth-movement during fire suppression activities at known locations. Use existing roads as fuel breaks, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. Use ridgelines or base of mountains for fuel break construction. The use of hand line for fuel break construction is

preferred.

- Monitor shooting area at Lawson Peak to determine potential impacts to plants.

Evaluation of Current Situation and Threats on National Forest System Lands

Ribes canthariforme is naturally rare and not well distributed; half of its known occurrences are on National Forest System lands. Forest Service activities do not appear to pose a substantial threat to this species, but known occurrences should be monitored regularly to determine if this remains true. Because natural populations are small and scattered, stochastic events such as fire or landslide could have a major impact on the persistence of this species. The species is included in a conservation strategy for coastal sage scrub (USDA Forest Service and others 1997).

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon and naturally rare in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Ribes canthariforme is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Ribes canthariforme* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Ribes canthariforme* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Quercus lobata

Romneya coulteri

Romneya coulteri

Romneya coulteri Harvey (Coulter's Matilda poppy)

Management Status

Federal: None

California: None

Heritage Rank: G3, S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4C, R-E-D Code 1-2-3

General Distribution

Romneya coulteri, Coulter's matilija poppy, occurs in the foothills of the Santa Ana Mountains in Los Angeles, Riverside, Orange, and San Diego Counties (California Native Plant Society 2001). The showy flowers have caused the plant to be cultivated and used as an ornamental.

Distribution in the Planning Area

Romneya coulteri occurs on the Cleveland National Forest along State Route 74 in the Santa Ana Mountains (CalFlora 2002). Other occurrences are likely but are not recorded in available databases.

Taxonomy and Natural History

Romneya coulteri is a dicot in the poppy family (Papaveraceae). It is one of two species of *Romneya* that occur in California and is distinguished from *Romneya trichocalyx* by flower and leaf characters (Clark 1993).

Romneya coulteri is a perennial rhizomatous herb that blooms March–July (California Native Plant Society 2001).

Habitat Description

Romneya coulteri often occurs in burned areas in chaparral, sage scrub, or along dry or rocky

watercourses (California Native Plant Society 2001). This species favors open or somewhat disturbed habitats, while mature chaparral or sage scrub may limit its expansion (Reiser 1994). In the Temecula area they grow in gravely sand up into the chaparral in red clay. Associated plants range from mulefat (*Baccharis*), willows (*Salix*), and cottonwoods (*Populus*) through *Ceanothus crassifolia*, *Quercus berberidifolia* (*dumosa*), *Rhus laurina*, *Salvia mellifera*, and *Adenostoma fasciculatum*.

Occurrence Status

Romneya coulteri is considered to be at risk of extirpation in a portion of its range but is found in sufficient numbers and wide enough distribution that the potential for extinction is low (California Native Plant Society 2001). This species is slowly declining in the foothills of the Santa Ana Mountains in Orange and Riverside Counties because of residential development into the foothills (Reiser 1994).

Threats

Information on threats to the *Romneya coulteri* is limited to physical disturbance where plants may grow. If growing in a disturbed site, such as a road right-of-way, the plants may appear to be "weedy." The large and showy flower, one of the largest in California, is attractive to sightseers and ornamentalists.

Specific risks to *Romneya coulteri* on National Forest System lands have not been identified. In general, this species is threatened by urbanization, agricultural conversion, flood control, and road widening and maintenance (California Native Plant Society 2001). Because this species is found in burned areas, shifts may occur in its potential habitat (Dudek and Associates 2000).

Conservation and Management Considerations

Because no specific risks to *Romneya coulteri* have been identified on National Forest System lands, no specific actions to conserve the species have been recommended up to this time.

Evaluation of Current Situation and Threats on National Forest System Lands

Romneya coulteri is found primarily off of National Forest System lands, with major threats coming from habitat conversion due to urban development. The species is a fire-follower and can be very abundant in open habitat for years after a fire (Winter pers. comm.), so the plant may be visually present only in early successional vegetation stages.

Based upon the above analysis *Romneya coulteri* has been assigned the following threat category:

4. Uncommon in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Romneya coulteri* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Romneya coulteri* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Rupertia rigida

Rupertia rigida (Parish) Grimes (Parish's rupertia)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-2

General Distribution

Rupertia rigida occurs in California from the Laguna Mountains to the San Bernardino Mountains in San Diego, Riverside, and San Bernardino counties (Munz 1974; California Native Plant Society 2001). There is one old record from the San Gabriel Mountains of Los Angeles County that needs confirmation. There are at least a dozen known locations in San Diego County (USDA Forest Service 2003). These include Horse Camp and Los Caballos Campground at Lake Cuyamaca and historical occurrences at Oak Grove, Julian, Pine Valley, Shrine Camp, east of Green Valley Campground, east of Oakzanita Peak, and Boulder Creek. The range of *Rupertia rigida* extends to Baja California (California Native Plant Society 2001).

Distribution in the Planning Area

Rupertia rigida occurs on the Cleveland, San Bernardino and possibly the Angeles National Forests. It is generally uncommon throughout its range, but can be locally common.

Taxonomy and Natural History

Rupertia rigida is a dicotyledon in the pea family (Fabaceae). This perennial herb blooms between June-July. Formerly called *Psoralea rigida*, the revised taxonomic account for *Rupertia rigida* appears in *Systematic Botany* 14:233 (1989) (California Native Plant Society 2001).

Rupertia rigida is a hairy plant with a woody caudex. The stems are erect, under 0.75 m, and have a purple base. The leaf stipule is 4-10 mm and linear-lanceolate or triangular. The petiole is 40-60 mm.

The leaflets are 35-65 mm, lanceolate, and have glands and hairs on both surfaces, although they are much denser on the upper sides. The inflorescence bract is 3-7 mm and deciduous. The calyx is 9-10 mm. The banner is 14-15 mm. Fruit are 9-13 mm, elliptic, golden-brown, smooth to faintly net-sculpted, and have glands and red-brown hairs. The beak is less than 3 mm and is widely attached. Seeds are 6.5-7 mm and red-brown (Grimes, J.W. 1993).

Habitat Description

Rupertia rigida occurs on dry slopes and flats in chaparral, cismontane woodland, and montane conifer forest, sometimes at the edges of meadows, pebble plains, or other openings between 700-2500 m (California Native Plant Society 2001, Munz 1974). On the San Bernardino National Forest, *Rupertia rigida* occurs in the understory of Jeffrey pine forest where it has been found in association with *Arctostaphylos patula*, *Eriogonum fasciculatum*, *Monardella linoides*, *Amorpha californica*, and *Tetradymia canescens* (California Natural Diversity Database 2002). More information is needed regarding this species' microhabitat preferences (Reiser 1994). This species was observed to grow and flower vigorously following the Willow Fire of 1999, where three known occurrences burned on the SBNF (Kopp pers. observation).

Occurrence Status

CalFlora (2002) reports twelve specific locations for *Rupertia rigida*. In addition, there are several occurrences on the San Bernardino National Forest.

The following table shows the recorded occurrences in/near the forest, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Rupertia rigida* (Parish's rupertia)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
1465728	U	1931	Bear Lake. Land owner: U.	SBD
1465725	U	1932	½ mi. SE of Jenks Lake. Santa Ana River Valley, San Bernardino Mountains. SBNF.	SBD
1193799	U	1961	Millard Canyon, San Gabriel Mountains. ANF.	LA

1229375	U	1932	Road to Burnt Valley. Santa Rosa Mountains. Land owner: U.	RIV
1229376	U	1927	Kenworthy summit. Of grade between Coahuila and Hamilton Grade. Land owner: U.	RIV
1398031, 1465726, 1323227	U	1932, 1960	Laguna junction. CNF.	SD
1460188	U	1894	Julian. Land owner: U.	SD
1372957	U	1925	3 mi. S of Oak Grove ridge. [Barker Valley?] CNF?	SD
1347574	U	1993	Laguna Meadow, Laguna Mountains. CNF	SD
1373372, 1392648, 1356898	U	1925, 1929, 1882	Oak Grove. Land owner: Priv/CNF?.	SD
1229377	U	U	Stonewell Mines, Cuyamaca Mountains. Cuyamaca Rancho State Park.	SD
*	5	2001	N of Fawnskin Valley. Steep W-facing hillside E of FR 3N08, N of Holcomb Creek, on the W slope of small 7102' peak. Within "Jackass 2" mining claim. Growing in dense <i>Cercocarpus ledifolius</i> woodland/mixed juniper-Jeffrey pine woodland. Associates include <i>Monardella linoides</i> , <i>Eriogonum fasciculatum</i> , <i>Amorpha californica</i> , <i>Tetradymia canescens</i> . Substrate: weathered, loose granite. Possible threat = disturbance from future mining	SBD

			activity. SBNF.	
*	> 100	2000	Big Pine Flat area. N, E, and W sides of JCT of FR 3N11 and 3N11A. Jeffrey pine forest burned in 1999 Willow Fire. Plants occur in openings, and cover a large area on the east side of 3N11, S of JCT w/ 3N11A. Area is within the proposed salvage sale area along road to be reconstructed and proposed as landing location. Plants were excluded from disturbance during project implementation. SBNF.	SBD
*	> 50	2000	Arrastre Flat area. ca. 1/5 mi. on both sides of 3N32. Jeffrey pine overstory. Close to pebble plain and riparian seep-meadow area with <i>Astragalus leucolobus</i> , <i>Arabis parishii</i> , <i>Packera bernardina</i> . Site is partially fenced and monitored, but small-scale mining occurs in the area. SBNF.	SBD
*	40	2001	Holcomb Valley. NE, SE, and SW of JCT of 3N16 and Van Dusen Canyon Road (3N09). <i>Pinus jeffreyi</i> overstory w/ occasional <i>Cercocarpus ledifolius</i> and an understory of <i>Artemisia tridentata</i> , <i>Chrysothamnus nauseosus</i> . <i>Arabis parishii</i> occurs adjacent to <i>Rupertia rigida</i> . Dispersed camping, mountain biking, and hiking occur nearby. A small scale mining claim is in the area, which was historically mined.	SBD

			Adjacent to popular campground and high recreational use area. Part of the area is already fenced, signed, and protected. SBNF.	
*	10	2001	Holcomb Valley. ca. 1/3 mi. SW of JCT of 3N16 and 2N09. Jeffrey pine overstory. w/ <i>Arctostaphylos patula</i> on granitic soil. Small scale mining claim in area. Site is fenced on two sides and protected from vehicular damage by surrounding shrubs. SBNF.	SBD
*	U	2003	Little Pine Flat, near 3N41 midway between 3N14 and Hawes Ranch.	SBD
*	U	2003	Greenspot, near junction of Hwy 38 and Forest Road 2N93.	SBD
*	U	2003 2005	Big Bear Valley, north shore. Within Serrano CG and across to the north side of Hwy 38.	SBD
*	4 colonies; 30 plants total	2004	Fawnskin, Sect. 2 & 3, SW of Delmar Mtn. concentrated near Camp Whittle	SBD
*	U	2004	Directly S. of Hwy 38 between Council group camp & Barton Flats Campground.	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *ANF = Angeles National Forest*
- *SBD = San Bernardino County*

- *LA* = Los Angeles County
- *RIV* = Riverside County
- *SD* = San Diego County

Threats

This species may be impacted by intensive recreational use and small-scale mining, primarily the Holcomb Valley occurrences.

Conservation and Management Considerations

The primary conservation strategy for this species is to improve the knowledge of its distribution, especially for NFS lands in the San Gabriel Mountains and Peninsular Ranges. The following is a list of conservation practices that should be considered for *Rupertia rigida*:

- Survey all new occurrences of *Rupertia rigida* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Rupertia rigida* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Rupertia rigida* in the area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Rupertia rigida is a locally-common patchily distributed rare plant species known from southern California and northern Baja California Norte. While several occurrences of this species are susceptible to identified threats, this species has been observed to be tolerant of low to moderate levels of disturbance.

Based on the above analysis, *Rupertia rigida* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Rupertia rigida is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Rupertia rigida* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Rupertia rigida* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Rupertia rigida* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Sanicula maritima

Sanicula maritima S. Watson (Adobe sanicle)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: Rare

Heritage Rank: G2, S2.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Sanicula maritima was historically found along the central California coast from San Francisco Bay south to San Luis Obispo County. It is now known from fewer than ten occurrences in Monterey and San Luis Obispo counties (California Natural Diversity Database 2004).

At the southern edge of the species range, *Sanicula maritima* is found in the Arroyo de la Cruz area along with a suite of species that are endemic to that geographic area (Keil and McLeod 1987). Two occurrences once found farther south in the San Luis Obispo area are now thought to be extirpated. *Sanicula maritima* has been documented from Camp San Luis Obispo; however, all records are more than fifty years old (Painter 2004).

Along the Big Sur coast of the Monterey Ranger District, on a coastal terrace, is a small population of *Sanicula maritima*. The plants here are located in an area known as Jade Cove on the west side of Hwy 1. At the northern edge of the plant's current range, *Sanicula maritima* is found in Molera State Park.

Distribution in the Planning Area

There is only one known occurrence of *Sanicula maritima* on National Forest System land and this location is at Jade Code on the Los Padres National Forest.

Taxonomy and Natural History

Sanicula maritima is a taprooted, herbaceous perennial 6 to 15 inches (16-38 cm) tall, green to yellow-green in color. The leaves are obovate to ovate-cordate, 1.2 to 3 inches (3-8 cm) long, entire to three parted. The flowers are yellow, slightly succulent, and grouped in 1-4 umbels. The normal blooming period is from April to May. The fruit is obovate, 5 mm long, with stout curved prickles.

Habitat Description

Sanicula maritima occurs in meadows, seeps, valley/foothill grasslands, chaparral, and coastal prairie habitats at elevations of 97–780 feet (30–240 meters). The species grows in moist clay or ultramafic soils (California Natural Diversity Database 2004).

Occurrence Status

The geographic distribution of *Sanicula maritima* off of National Forest System lands has been reduced by loss of habitat. Entire populations at the southernmost and northernmost portions of the species range have become extirpated (California Native Plant Society 2001, Keil and McLeod 1987). Populations in the area around Arroyo de la Cruz appear to be stable though there is little data available on trends in population size (Keil and McLeod 1987). This land is owned by the Hearst Corporation and is managed as rangeland with low to moderate grazing intensity. Habitat for *Sanicula maritima* does not appear to be in decline in this area due to livestock grazing.

About 100 plants of *Sanicula maritima* were observed at Molera State Park in both 1987 and 1990.

Counts of *Sanicula maritima* at Jade Cove show a downward trend in the number of plants: from about 300 in 1985 to less than 100 in 1987. In 1994, the number of plants reported from this site was over 50. A recent count (Foster 2003) found about 119 plants. In the Gorda Allotment, the proposed action of a decision signed December 6, 2004, is to build a fence on the north side of Plaskett Creek which would prevent cattle entry to the creek and the terrace above Jade Cove where Adobe sanicle is found. The terrace would not be removed from the allotment; however future use would be dependent upon further environmental analysis (Kwasny pers. comm.).

OCCURRENCE DATA – *Sanicula maritima* (Adobe sanicle)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1950	ON OPEN SLOPE, W BASE OF CERRO ROMAULDO, W OF SAN LUIS OBISPO.	SLO

2	U	1947	FIRST RIDGE W OF CERRO ROMAULDO, NEAR SAN LUIS OBISPO.	SLO
7	LESS THAN 200 PLANTS IN 1981; 1000+ SEEN IN 1983,	1983	ARROYO DE LA CRUZ; ALONG RIDGE SOUTH OF ARROYO AT HEAD OF SOUTHWEST TRENDING DRAINAGE, ABOUT 1.3 MI EAST OF HIGHWAY 1. SITE MAPPED 250 METERS NW OF CINNABAR BENCHMARK.	SLO
8	U	1980	ABOUT 1 MILE NORTH OF ARROYO DEL OSO AND 0.75 MILE EAST OF HIGHWAY 1, JUST EAST OF PRIVATE ROAD. MAPPED ALONG RIDGE BETWEEN ARROYO DE LE CRUZ AND ARROYO DEL OSO.	SLO
9	FEWER THAN 200 PLANTS OBSERVED IN 3 COLONIES IN 1983.	1983	ABOUT 0.55 MILE EAST OF YELLOW HILL, SW-FACING SLOPE OF RIDGE BETWEEN ARROYO DE LOS CHINOS AND ARROYO DE LA CRUZ. THREE COLONIES MAPPED NEAR HEAD OF CREEK JUST NORTH OF ARROYO DE LA CRUZ.	SLO
10	< 50 in 1983	1983	YELLOW HILL, S OF ARROYO DE LOS CHINOS.	SLO

11	< 50 in 1983	1983	ANDREW MOLERA STATE PARK, PANORAMA TRAIL. NEAR SOUTHERN BOUNDARY OF PARK. IN OR IMMEDIATELY ADJACENT TO TRAIL. ABOUT 0.5 AIRMI ALMOST DUE WEST FROM VABM 1209, "CORNER."	SLO
12	50-100	1996	LAGUNA LAKE PARK, SAN LUIS OBISPO. MOIST SWALE ON GENTLE SLOPE NEAR POWERLINE CORRIDOR WEST OF DEVELOPED AREA OF PARK.	SLO

- U = Unknown
- * = an occurrence number has not been assigned
- SLO = San Luis Obispo

Threats

Trampling from horses, mountain bikes, and foot traffic impacts the plants at Molera State Park.

At Jade Cove, habitat for *Sanicula maritima* is degraded by the presence of invasive plant species, particularly Kikuyu grass (*Pennisetum clandestinum*) and human foot traffic. This taxon is present within the Gorda Allotment, Pacific Valley Unit, on terrace above Jade Cove however the occurrence will be fenced and excluded from cattle effects (Kwasney pers. comm.). This occurrence is located in the middle of the taxon's range. Because of the small size of the population found on NFS land (less than 200 plants) and the small amount of occupied habitat (about 2-3 square meters) this population has a high risk of being extirpated by a combination of factors: trampling, displacement by non-native herbs, and stochastic events such as cliff-side erosion.

Conservation and Management Considerations

- Consider placement of a small boardwalk or re-routing of the Jade Cove Trail to avoid impacts to *Sanicula maritima*.

- Use integrated pest management techniques to control or eradicate kikuyu grass in and around areas occupied by *Sanicula maritima*.
- Annually census the occurrence of *Sanicula maritima* found at Jade Cove to determine annual variations in detectability and to ascertain the trends in abundance.

Evaluation of Current Situation and Threats on National Forest System Lands

Sanicula maritima is very uncommon, with only about 116 plants on NFS land, and this small population is threatened by foot traffic, cliff erosion, and potentially, by invasive nonnative plants.

Based upon the above analysis *Sanicula maritima* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

Sanicula maritima is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Sanicula maritima is found at only one location on NFS land and this one site is on the edge of a coastal terrace. Some evidence of slumping is present and it is possible that all of the occupied habitat could slide downward creating conditions unfavorable for *Sanicula maritima*. Because of the small size of the population (116 plants in 2003) and the small amount of area occupied (less than 2 square meters), other stochastic events could cause the extirpation of this population. Because of this, even with successful control of foot traffic and competing vegetation, there is a moderate probability that this population would become extirpated under all alternatives.

Viability Outcomes For All Lands Within the Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Occurrences of *Sanicula maritima* have been lost in Alameda, San Francisco, and San Luis Obispo counties but remaining occurrences not on National Forest System Lands appear to be relatively free of threats at this time.

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Rupertia rigida

Satureja chandleri

Satureja chandleri

Satureja chandleri (Bdg.) Druce (San Miguel savory)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4, S3.2? (California Natural Diversity Database)

California Native Plant Society (2001): List 1B R-E-D Code 2-2-2

General Distribution

Satureja chandleri, San Miguel savory, is known from the Peninsular Ranges of Orange, Riverside, and San Diego counties and from Baja California, Mexico (California Native Plant Society 2001, Averett 1993).

Distribution in the Planning Area

The California Natural Diversity Database (CNDDDB) lists four recorded occurrences of *Satureja chandleri* on the Cleveland National Forest: Lion Canyon below the San Juan picnic area; San Juan Canyon upstream from the San Juan picnic area; Hot Springs Canyon; and along Chiquito Springs south of Blue Jay Campground (California Natural Diversity Database 2004).

Taxonomy and Natural History

Satureja chandleri is a perennial herb in the mint family (Lamiaceae) that blooms March–July (California Native Plant Society 2001). This erect shrub species stands to one half meter tall, has woody stems with recurved white hairs, and red-brown bark. Deltate to ovate-deltate leaves (5-15 mm by 4-16 mm) are shallowly crenate-dentate with short, white hairs. Inflorescence 1-6 flowered per leaf axis, pedicel 1-3 mm. Purple tinged flower calyx is 6-8 mm and bell-shaped; white to lavender corolla 4-7 mm. The small fruits (\pm 1.5 mm) have a shiny dark brown, more or less net-like surface (Averett 1993).

Habitat Description and Status

Satureja chandleri occurs on soils derived from gabbro or metavolcanics in shaded areas of chamise chaparral, coastal scrub, oak woodlands, riparian woodlands, and grasslands at elevations of 390–3,525 feet (120–1,075 meters) (California Native Plant Society 2001). Disjunct occurrences in the Santa Ana Mountains appear to occupy habitat that is more mesic than populations in San Diego County and Baja California (Stephenson and Calcarone 1999).

Occurrence Status

Satureja chandleri occurs in small, restricted geographical areas within its range. California Natural Diversity Database (CNDDDB) occurrence reports for *Satureja chandleri* show one quarter of all documented populations to occur within Cleveland National Forest boundaries, forty-three percent occur on private property, almost eighteen percent are on land managed by the Bureau of Land Management (BLM), and twelve and on half percent occurs on land of unknown ownership (California Natural Diversity Database 2004). Cleveland National Forest records document three populations not listed in CNDDDB documented occurrences, increasing population occurrence from twenty-five percent to thirty-six percent on Cleveland National Forest land.

OCCURRENCE DATA of *Satureja chandleri* (San Miguel Savory) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
*	2-1	U	1940	Elsinore Mountains / CNF	RIV
*	2-2	U	1986	Ortega Highway / CNF	RIV
*	2-3	U	1972	NE of San Juan Station / CNF	RIV
18	2-4	10,000 +	1986	Chiquito Canyon / CNF	O
*	2-5	10,000 +	1993	Chiquito Canyon / CNF	O
15	*	U	1981	Lion Canyon / CNF	O

16	*	U	1982	San Juan Canyon / CNF	O
17	*	1000	1982	Hot Spring Canyon / CNF	O

- U = Unknown.
- * = an occurrence number has not been assigned
- CNF = Cleveland National Forest,
- O = Orange County
- RIV = Riverside County

Threats

Populations of *Satureja chandleri* on National Forest System lands may be subject to trampling by foot traffic from nearby trails and campgrounds (California Natural Diversity Database 2004). The species may also be vulnerable to horticultural collecting (Stephenson and Calcarone 1999).

Recorded populations of *Satureja chandleri* on private land are potentially threatened by inundation by proposed Fallbrook reservoir, herbicide used to control poison oak (*Toxicodendron diversilobum*), and one large occurrence in the Santa Ana Mountains is located near a proposed urban development project. Four populations known to occur within BLM jurisdiction, land proposed for exchange out of BLM ownership may affect 3 populations (California Natural Diversity Database 2004).

Conservation and Management Considerations

Satureja chandleri should be protected from severe disturbance on National Forest System lands, however overall management potential for this species is low.

The following is a list of conservation practices that should be considered for *Satureja chandleri*:

- Monitor populations along trails and adjacent to public facilities, implement protection/education measures as needed.
- Monitor, map, and survey potential habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Allow wildland fires to freely burn on through populations. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks and roads, but refrain from widening these roads as part of fire suppression activities as some populations are adjacent to roads. The use of hand line for fuel break construction is preferred.

Evaluation of Current Situation and Threats on National Forest System Lands

Satureja chandleri occurs in relatively few locations on the Cleveland National Forest. Some occurrences are near recreation areas and may be subject to trampling, however no substantial risks are known at this time. Known populations that have been monitored appear to be robust.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Satureja chandleri is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Satureja chandleri* would remain distributed across its current geographic range on National forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Satureja chandleri* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Sanicula maritima

**Scutellaria bolanderi ssp.
austromontana**

Scutellaria bolanderi ssp. austromontana

Scutellaria bolanderi Gray *ssp. austromontana* Epling (Southern skullcap)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4T2, S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Scutellaria bolanderi spp. *astromontana*, Southern skullcap, occurs in San Diego, Riverside, and San Bernardino counties. This species is known primarily from collections in the San Jacinto Mountains and the Peninsular Ranges of San Diego County (Beauchamp 1986, California Department of Fish and Game 2002, Reiser 1994), and from a historic collection near the San Bernardino Mountains (Stephenson and Calcarone 1999). In the Santa Ana Mountains it is documented from the Santa Rosa Plateau (Roberts et. al. 2004). More information is needed regarding the El Monte location in the San Gabriel Valley.

Distribution in the Planning Area

Scutellaria bolanderi spp. *astromontana* occurs on the Cleveland and San Bernardino National Forests. Occurrences in the vicinity of Palomar Mountain, near Pine Valley Creek, near Japatul Valley, and at Deer Park are on or adjacent to the Cleveland National Forest (California Department of Fish and Game 2002). One occurrence was recently relocated on the Cleveland National Forests at Indian Creek/Deer Park area, consisting of two small populations with approximately 500 individuals. Another occurrence has been recently reported on Viejas Mountain (Rebman pers. comm.) also on the Cleveland National Forest. Several occurrences are known on the San Jacinto District of the San Bernardino National Forest (Lardner pers. comm.; White draft 2001). Occurrences are also known from private lands within the planning area and also from the Santa Rosa Plateau.

Taxonomy and Natural History

Scutellaria bolanderi ssp. *astromontana* is a perennial rhizomatous herb in the mint family (Lamiaceae) that blooms June-August (California Native Plant Society 2001). It is one of two subspecies of *Scutellaria bolanderi* that occur in California. Subspecies *astromontana* differs from ssp. *bolanderi* in geographic range and in flower and leaf characters (Olmstead 1993).

Leaves are 2 times wider than long; basal petioles 2-10 mm; upper cauline blades ovate to cordate, crenate (rarely entire), base truncate to more or less lobed, tip rounded. Flower pedicel 2-3 mm, calyx 3-5 mm, ridged; corolla 12-14 mm, white, lower lip mottled, inner surface long soft-hairy. Fruit brown to black (Olmstead 1993).

Habitat Description

Scutellaria bolanderi ssp. *astromontana* grows on gravelly soil (sometimes gabbro) on stream banks or in mesic sites in oak or pine woodland at elevations of 1,400-8,000 feet (425-2,000 meters) (Stephenson and Calcarone 1999; California Department of Fish and Game 2002).

Occurrence Status

The California Natural Diversity Database (CNDDDB) records 16 occurrences for *Scutellaria bolanderi* ssp. *astromontana* (California Department of Fish and Game 2002). Seven of these occurrences potentially occur on the Cleveland National Forest, 3 on the San Bernardino National Forest, and one near the Angeles National Forest. The remaining occurrences are on privately held lands or land of unknown ownerships. Many of the CNDDDB occurrences are old and/or unconfirmed reports needing current population status surveys. There has been recent documentation of occurrences on the Cleveland and San Bernardino National Forests; these populations are extant and are protected as projects are proposed. The Santa Rosa Plateau occurrence was vouchered in 1989 and is expected to be extant.

OCCURRENCE DATA of *Scutellaria bolanderi* ssp. *astromontana* (Southern skullcap) on National Forest and adjacent lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
1	*	U	U	Morena Village / private near CNF	SD
2	*	U	U	USFS 16S06 and Pine Creek Road / CNF ?	SD

3	*	U	U	Pine Valley Creek / Noble Cyn Trailhead / CNF ?	SD
4	*	U	U	Japatul Valley / near CNF ?	SD
5	*	U	U	Viejas Valley / CNF, BIA	SD
6	2-1	500+	2001	Indian Creek, Deer Park / CNF	SD
10	*	U	U	Fry Creek, French Valley, Doane Creek / CNF ? and private	SD
12	*	U	U	Upper May Valley and Upper Hurkey Creek / SBNF ? Collected by Ziegler, vouchered at UCR (White 2001)	RIV
13	*	U	U	Idyllwild vicinity / SBNF ?	RIV
14	*	U	U	Strawberry Creek / SBNF ?	RIV
15	*	U	U	El Monte San Gabriel Valley / near ANF	LA
*	*	U	U	Viejas Mountain / CNF	SD

*	*	U	1989	Santa Rosa Plateau. Collected by Hirshberg, vouchered at UCR herbarium. (Roberts et. al. 2004).	RIV
*	*	U	U	Near Mountain Center, in unnamed ephemeral stream ca. ½ mi SW of Mtn. Ctr. Occurring with <i>Hemizonia mojavensis</i> (White draft 2001)	RIV

- U = Unknown
- * = an occurrence number has not been assigned
- SBNF = San Bernardino National Forest
- ANF = Angeles National Forest
- CNF = Cleveland National Forest
- BIA = Bureau of Indian Affairs (Viejas Indian Reservation)
- LA = Los Angeles County
- RIV = Riverside County
- SD = San Diego County

Threats

Populations of *Scutellaria bolanderi* spp. *astromontana* on state and federal lands are fairly well protected, while populations on private land may be subject to development (USDA Forest Service 1998). Populations in the mountains of San Diego County may be affected by recreational activities (Reiser 1994). Threats to occurrences within the Santa Rosa Plateau in the Santa Ana Mountains are expected to be minimal to none.

On the Cleveland National Forest, populations at Indian Creek/Deer Park are within a grazing allotment that may potentially impact plants, although the largest of these two occurrences is located along Indian Creek, in a moderately steep drainage surrounded by thick brush that limits access to grazing or other potential threats. The Viejas Mountain population may be within the area being considered for establishment of the Viejas Mountain Research Natural Area.

On the San Bernardino National Forest, threats to habitat are considered low at this time (Lardner per. comm.) Use of prescribed fire in habitat is avoided although backing fires are allowed. Effects to habitat from tree removal are avoided by maintaining a riparian area buffer.

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Scutellaria bolanderi* ssp. *austromontana*:

- Monitor, survey and map potential habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.
- Protect all populations.
- Allow wildland fires to freely burn on through populations. Minimize earth-movement in drainages during fire suppression activities. Use existing roads as fuel breaks and roads. The use of hand line for fuel break construction is preferred.
- Utilize riparian area buffers as necessary to protect habitat from proposed activities.
- Implement actions in the SBNF Meadow Habitat Management Guide to the greatest extent practicable.
- On the SBNF, complete a habitat management guide for vernal wetlands that includes this taxon.

Evaluation of Current Situation and Threats on National Forest System Lands

Scutellaria bolanderi ssp. *austromontana* is apparently uncommon but widely distributed in southern California. On the Cleveland National Forest, status of some occurrences have not been recently verified although others are known to be extant. It is possible the taxon may be more common than current records indicate. Because it grows along streams or in mesic areas, it could be subject to impacts from recreationists or grazing livestock. However, it is not recorded from any popular recreation areas, and it appears to grow in inaccessible areas of one allotment where it occurs. In addition, this taxon occurs in riparian areas and habitat for this taxon receives a higher level of protection due to implementation of riparian management strategies.

On the San Bernardino National Forest this taxon is included in the SBNF Meadow Habitat Management Guide. During project activities, occurrences also receive protection through implementation of riparian management strategies. There is a low level of threat to this taxon from Forest Service activities on the San Bernardino National Forest (Lardner pers. comm.).

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon but widely distributed in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Scutellaria bolanderi ssp. *austromontana* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects

through the development of a biological evaluation at the site-specific level.

Scutellaria bolanderi ssp. *austromontana* is widely distributed within its geographic range and often occurs in inaccessible habitats. *Scutellaria bolanderi* ssp. *austromontana* appears to have low vulnerability on the Cleveland National Forest (Stephenson and Calcarone 1999) and on the San Bernardino National Forest (Lardner pers. comm.). The direct and indirect effects from national forest management activities on species-at-risk, by alternative, are described in the FEIS. As described above (Evaluation of Current Situation and Threats), there are no substantial threats to the distribution or persistence of *Scutellaria bolanderi* ssp. *austromontana*. Variations in land use designations would not alter this current situation and the various emphases of the alternatives would not result in a substantial change in conditions for *Scutellaria bolanderi* ssp. *austromontana*. *Scutellaria bolanderi* ssp. *austromontana* would remain generally well distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for All Lands within Range of Taxon

Scutellaria bolanderi ssp. *austromontana* appears to have low vulnerability across its range. It is presumed stable within the Peninsular Range portion of its habitat; but such an assessment needs further verification. Also, information is needed about the distribution and population numbers of this species (Reiser 1994). Total abundance and distribution is suspected to be greater than actually recorded due to lack of surveys and documentation. The occurrence at the Santa Rosa Plateau in the Santa Ana Mountains is expected to continue to receive habitat protection over the long term. By maintaining the current distribution of *Scutellaria bolanderi* ssp. *austromontanum* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Scutellaria bolanderi* ssp. *austromontana* to suffer a decline in its overall distribution.

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Satureja chandleri

Sedum niveum

Sedum niveum

Sedum niveum Davidson (Davidson's stonecrop)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3; S3.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-2-2

General Distribution

Sedum niveum occurs in the San Bernardino and Santa Rosa mountains of Southern California and in Baja California, Mexico. Occurrences have also been documented from the New York Mountains in the Mojave Desert. Within the Santa Rosa Mountains, plants are found on Toro Peak and Santa Rosa Mountain (USDA Forest Service 2002). In the San Bernardino Mountains, occurrences are known from Sugarloaf and Charlton peaks, on the south side of Van Dusen Canyon, above Dry Canyon, at Snow Canyon, and above Dollar Lake (Krantz, et. al. 2000) and on the east side of Forest Road 2N93. *Sedum niveum* has also been recorded from Observatory Peak in the Sierra San Pedro Martir of Baja California, Mexico (Bennett 1979).

Distribution in the Planning Area

Within the planning area, *Sedum niveum* is known from the San Bernardino and Santa Rosa mountains. Although the exact number of occurrences is unknown, there are records from possibly thirteen locations on the San Bernardino National Forest. Occurrences include Charlton Peak and Dollar Lake (both within the San Gorgonio Wilderness of the SBNF), Sugarloaf Peak, Van Dusen Canyon, west of Hitchcock Ranch, and Santa Rosa Mountain. Occurrences are also known from lower Holcomb Valley, Forsee Creek Trail, and Lost Creek Canyon (Krantz, et. al. 2000) and on Forest Road 2N93. An occurrence on San Bernardino Mountain is questionable (Bennett 1979). The occurrence from Dry Canyon is probably also on the SBNF, but the exact location within Dry Canyon is unknown. A record from Snow Canyon may also be within or near the northern boundary of the San Jacinto Wilderness of the San Bernardino National Forest (USDA Forest Service 2002). The occurrence on Toro Peak is on the

Santa Rosa Indian Reservation.

Taxonomy and Natural History

Sedum niveum is a prostrate glabrous perennial herb in the stonecrop family (Crassulaceae). The plant has fleshy roots (rhizomatous stems) that are 1-3 dm long and 5-6 mm thick. Trailing stems are up to 2 dm long, 1-5.5 mm thick, succulent, branched, spreading and rooting, and forming diffuse mats. Branches are finally erect, 5-10 cm long, 1-3 cm high, and develop either loose rosettes that are 6-16 mm in diameter of spirally arranged leaves, or, eventually, elongated flowering stems that are 3-4 cm tall. Leaves are many, sessile, alternated, cuneate-obovate to oblanceolate, rounded to apiculate but mostly obtuse, plano-convex, fleshy, minutely papillose, dark to yellow green and sometimes speckled with red. Leaves are 4-13 mm long, 2-5 mm wide, and 1-3 mm thick.

Inflorescences are 1-2 cm long, containing between one and nine flowers. Flower petals are spreading to reflexed, 5-8 mm, lanceolate, acute, and white or pink-tinged or -veined. There are 10 stamens, with white filaments and anthers that are red to black with yellow pollen. The fruit is erect and 5-7 mm long, with yellowish or whitish nectar glands that are sometimes streaked with red. The seed is more or less 0.5 mm in length and subovoid, obscurely reticulate, lustrous and brown. Flowering occurs between late June and early August (Bennett 1979; Denton 1993).

The occurrence of *Sedum niveum* from Baja California has several differences from its more northern counterparts. The Baja California population has narrower leaves, larger and more spreading sepals, and red spots on the petals of many plants. The Baja California plants are also octoploid, with $n = 64$ chromosomes, compared to the $n = 16$ chromosome number of the U.S. populations. In addition, the flowering period in the Baja California occurrence happens later, between July and mid-September (Bennett 1979).

Habitat Description

Occurrences of *Sedum niveum* are found on steep, north-facing slopes on rocky ledges and in crevices composed of granitic or carbonate substrate. Some occurrences have been found on northeast- or northwest-facing slopes, but plants are generally shaded by rocks in these cases. Minimal sunlight exposure and summer thundershowers maintain moist soil for *Sedum niveum* plants. The plant is also purported to thrive on leaf mold derived from fallen pine needles (Walther in Bennett 1979). In southern California, occurrences are found between 5,450 and 9,685 feet in elevation, while in Baja California, Mexico, elevation range is 8,290 to 9,215 feet (Bennett 1979).

Sedum niveum occurs in upper montane coniferous forest with lodgepole pine (*Pinus contorta* var. *murrayana*), pinyon pine (*Pinus monophylla*), and white fir (*Abies concolor*) (USDA Forest Service 2002). Other associated species include *Ribes montigenum*, *Penstemon caesius*, *Silene parishii*, *Draba corrugata*, and *Selaginella watsonii* (Bennett 1979).

Within the southern California National Forests, suitable habitat for *Sedum niveum* is mostly distributed on slopes of the San Bernardino Mountains south of Big Bear Lake. Some areas of suitable habitat are within the San Gorgonio Wilderness, and these areas are threatened by trampling from equestrian and hiker use. Other areas of suitable habitat outside of the wilderness are threatened by dispersed recreation, mineral extraction activities, and ski area expansion (USDA Forest Service 2002). Suitable habitat for *Sedum niveum* on the San Jacinto Ranger District of the SBNF appears to be confined to the north-facing high-elevation slopes of the Santa Rosa and San Jacinto Mountains. Threats to this area are unknown.

Occurrence Status

There are currently no occurrences of *Sedum niveum* recorded in the CNDDDB (2004). However, there are at least 34 known occurrences, at least thirteen (possibly more) of which occur on the SBNF. Records from Dry Canyon and Snow Canyon may be on the SBNF, but the exact location of these occurrences is unknown. Population abundance and trend information is unknown for all occurrences of *Sedum niveum*.

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Sedum niveum* (Davidson's stonecrop)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
*	U	U	Charlton Peak, San Bernardino Mountains. SBNF-San Gorgonio Wilderness	SBD
300690 (RSA)	U	1973	SE of Dollar Lake, San Bernardino Mountains. SBNF-San Gorgonio Wilderness. Elev. 8000ft. (Shevock/RSA)	SBD
12572 (RSA)	U	1922	Dollar Lake, locally abundant on rock ledges, 9250 ft. (Munz, Pierson, RSA) SBNF	SBD
183937 (RSA)	U	1932	Dry rocky slope, ½ m E of Dollar Lake, 9300 ft. (Munz/RSA) SBNF	SBD

38831 (RSA)	U	1947	Dry rocky ledge, Dollar Lake, 9400 ft. (Munz, RSA) SBNF	SBD
33244 (RSA)	U	1946	Sugarloaf trail from Rathbone Creek, elev. 9500 ft. (Howe, RSA) SBNF	SBD
36758 (RSA)	U	1932	Steep NW slope between rocks, Sugarloaf Mt. (Fosberg, RSA) SBNF	SBD
*	U	2004	Sugarloaf Peak, San Bernardino Mountains. (VinZant, USFS) SBNF	SBD
*	U	U	South side of Van Dusen Canyon, San Bernardino Mountains. SBNF	SBD
*	U	U	Above Dry Canyon, San Bernardino Mountains. SBNF?	SBD
*	U	U	Lower Holcomb Valley on limestone outcrop, 7200 ft.	SBD
*	U	1978	Holcomb Valley, T3N, R1W, S36 on limestone at west end of Valley. This occurrence is just west of the Hitchcock Ranch and is most likely under claim for mining (Kopp) SBNF	SBD
*	U	U	Forsee Creek Trail, 7600 ft.	SBD
84208 (RSA)	U	1920	Creek east of Foresee Creek, north base of Mt. San Bernardino, 5500 ft. Location of this specimen is questioned by R.T. Clausen. SBNF	SBD

84211 (RSA)	U	1924	Lost Creek Canyon, 8,000 ft. (Peirson/RSA)	SBD
47967 (RSA)	U	1924	Frequent on rocks, Lost Creek, 7200 ft. (Munz and Johnson, PO)	SBD
*	U	U	Snow Canyon. U-in or north of San Jacinto Wilderness	RIV
206254 (RSA)	U	1968	Abundant among rocks on NE slope, ridge 1 mile NW of Toro Peak, 2250 m, August 3 (Moran, RSA) most likely SBNF	RIV
*	U	U	Toro Peak, Santa Rosa Mountains. Santa Rosa Indian Reservation.	RIV
*	U	1968	Common on rocky NE slope of Santa Rosa Mountain, 2250 m August 3. (Moran, RSA) this may be same occurrence as 1m NW of Toro Pk. Above. SBNF	RIV
*	U	U	Santa Rosa Mountain, Santa Rosa Mountains. Santa Rosa Indian Reservation.	RIV
655127 (RSA)	U	1999	South Fork Santa Ana River: East of poopout Hill; near water pipeline intake site. USGS Moonridge 7 1/2' quad. (S1/2) & (26 (N1/2) 34y08-09'N, 116y51'W (White/RSA)	SBD

303654 (RSA)	U	1979	San Bernardino National Forest, near Holcomb Creek where crossed by 3N12 below Hitchcock Ranch in Holcomb Valley; elev. 7150-7250 ft. crevices in rocks, dolomitic, on N facing slope above Holcomb Creek. (Thorne/ RSA)	SBD
616114 (RSA)	U	1998 2005	San Bernardino Mts.: on ridge east of sugarloaf pk. To trail heading down into green cyn. Elev. 9000-9950 ft. growing on steep N slope dominated by <i>Pinus contorta</i> ssp. <i>murrayana</i> . Also along east side of Forest Road 2N93 just east of <i>Botrychium</i> occurrence in Wildhorse meadow. (Kopp, Vollmer, Wagner, Yaeger). Photographed not vouchered.	SBD
40603 (RSA)	U	1948	Santa Rosa Mts. N slope, by rocks on steep N slope	RIV
289374 (RSA)	U	1974	10 air miles E. of Cima, on N side of granitic crest, ¼ mile N of summit; elev. 6800-7200 ft. along crest of mts. (Henrickson/RSA)	SBD
1817175 (CalFlora)	U	1986	NE of Banning, E branch of Millard Cyn, along trail to Kitching Peak (Pitzer, Myers, Wilkinson, Glenn)	SBD
JEPS50038 (SMASCH)	U	1929	San Bernardino Mts., Falls Creek above Mill Creek, decumbent over rocks in shade. elev. 7200 ft. (Peterson/CalFlora)	SBD

UC146389 (SMASCH)	U	1977	San Bernardino mts., on Van Dusen Cyn. Rd. 1.2 mi. on a steep, N facing, dolomite cliffs	
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- U = Unknown
- * = an occurrence number has not been assigned
- SBNF = San Bernardino National Forest
- NPS = National Park Service
- SBD = San Bernardino County
- RIV = Riverside County

Threats

Occurrences of *Sedum niveum* on SBNF lands are potentially threatened by mineral extraction activities, ski area expansion, fuels treatments and dispersed recreation. A threat to the habitat would be removal of the overstory (Bennett 1979).

Conservation and Management Considerations

The following list of conservation practices should be considered for *Sedum niveum*:

- Survey all new occurrences of *Sedum niveum* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Sedum niveum* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Sedum niveum* in the planning area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Occurrences of *Sedum niveum* on SBNF lands are potentially threatened by mineral extraction activities, ski area expansion, and dispersed recreation. Some locations on the San Bernardino National Forest are located in designated Wilderness or are otherwise protected from vehicles and trampling by their habitat preferences.

A threat to the habitat would be removal of the overstory (Bennett 1979). The San Bernardino and San Jacinto mountains experienced a high rate of tree mortality in some locations in the past several years. Since habitat for this species occurs on north slopes where moisture is higher and covered with *Selaginella watsonii*, in 2003, it was thought that tree mortality was highly unlikely and was not

considered a threat, but was mentioned to document the possibility. Since 2003, more trees have died within the taxon’s range resulting in concern for wildland fire effects to adjacent urban communities and escape routes along forest roads. Due to this situation, several locations within the range of *Sedum niveum* have since been helicopter logged or are proposed for this treatment. Therefore, in 2005, the effects of logging combined with reduced shade resulting from tree mortality and logging operations are included here as threat to this taxon. The degree of this threat is considered to be low based on the fact that *Sedum niveum* occurs in rocky outcrops within steep terrain that would not be used for road construction, nor utilized as log landings or helicopter landing sites. Plants observed growing on the roadcut along Forest Road 2N93 were located above the height that would be affected by road maintenance and were mostly growing within rocks.

Based on the above analysis, *Sedum niveum* has been assigned the following threat category:

- 5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	C	A

Sedum niveum is a USDA, Region 5 Forest Service, Sensitive species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site specific level.

Surveys within completed and recommended fuels treatments to date on the Mountaintop Ranger District have not encountered this taxon however there is potential that occupied habitat could be encountered within the life of the forest plan while performing fuel treatments in Wildland Urban Interface defense and threat zones. This information, combined with land use zoning of those occurrences with locations described in enough detail to locate them on the maps, and Forest-wide Standards that relate to mining and protection of rare species were considered when predicting outcomes.

The north slope of Santa Rosa Mountain is zoned as Back Country in Alternatives 1, 2, 4, and 5. In Alternative 4a, this location is zoned as Back Country Non-Motorized and Back Country. In Alternative 3, it is recommended wilderness and in Alternative 6 it is Back Country Non-Motorized.

Occupied habitat on the north slope of Sugarloaf Mountain is zoned Back Country Non-Motorized in Alternatives 1 and 4a. In Alternatives 3, 4 and 6, this area is recommended as the Sugarloaf Wilderness which would limit new ski area proposals. Under Alternative 5, Sugarloaf Mountain would become zoned Back Country.

The Holcomb Valley occurrence west of Hitchcock Ranch is zoned as Back Country in all alternatives except 6, however if this area were under existing claim, designation of this location as Back Country Non-Motorized may not limit use under a Plan of Operation.

Alternatives 3 and 6 appear to provide the greatest protection for this taxon; with Alternatives 4 and 4a providing the next best level of protection.

Viability Outcomes for All Lands Within Range of Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	B	B

Sedum niveum is known from the Santa Rosa Indian Reservation, the Mojave National Reserve and the Sierra San Pedro Martir, Baja California, Mexico. Threats and conservation management at these locations are not known, however it is presumed occurrences within the Mojave Reserve are managed for long-term protection.

By maintaining the current distribution of *Sedum niveum* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Sedum niveum* to suffer a decline in its overall distribution.

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**Scutellaria bolanderi ssp.
austromontana**

Sibaropsis hammittii

Sibaropsis hammittii

Sibaropsis hammittii S. Boyd & T. S. Ross (Hammitt's clay-cress)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B R-E-D Code 3-2-2

General Distribution

Sibaropsis hammittii, Hammitt's clay-cress, is a newly-described species discovered recently on three mountains in the Peninsular Ranges of southern California in San Diego and Riverside counties: at Elsinore Peak in the Santa Ana Mountains, and on Poser and Viejas Mountains in the Cuyamaca Range (Boyd and Ross 1997).

Distribution in the Planning Area

All occurrences of *Sibaropsis hammittii* are located on the Cleveland National Forest, although some portions of the populations spill over onto Indian reservation and private lands (Boyd and Ross 1997).

Taxonomy and Natural History

Sibaropsis hammittii is an annual species that flowers from March–April and is the sole member of the new genus, *Sibaropsis* (Hirshberg 1994, California Native Plant Society 2001). The leaf, flower, and fruit characteristics of this species distinguish it from any other mustard species occurring in California (Boyd and Ross 1997).

Leaves are narrowly linear (10-30 mm long by 0.5 to 1.0 mm wide), sessile, lack auricles, light green and slightly glaucous, glabrous except for a few cilia on lowest nodes; more or less erect-ascending, opposite at first 1-2 nodes of main axis and lowermost branches, becoming alternate and congested above; no true basal rosette. The inflorescence is loosely racemose, few flowered (less than 10), with

flower buds initially crowded. The pedicels are slender, 2-4 mm long in flower, 3-4 mm long in fruit. The calyx is tubular, glabrous; four oblong-lanceolate to oblong-ovate sepals subequal, erect, free at base, purplish to greenish purple with paler bases and narrow whitish bands at margin. The corolla has a well-developed limb and well-exserted petal claws; four unguiculate-spatulate petals, 8.5-10 mm long by 2.0-2.5 mm wide, with an apex that is shallowly and broadly notched with acute and rounded deltoid lobes, light purplish-lavender or pinkish-lavender with darker purple veins. Stamens are arranged in three unequal series. The ovary is oblong (2 mm) and variable, style bearing an unlobed discoid stigma that is slightly wider than style diameter. Fruit is a dehiscent silique, suberect, narrowly linear and somewhat flattened parallel to septum, 20-25 mm long, 0.6-0.8 mm wide, with a slender, persistent, moderately beaked style (Boyd and Ross 1997).

Habitat Description

Sibaropsis hammittii is found on vernal saturated clay soils in patches of purple needlegrass grassland surrounded by chamise chaparral (Boyd and Ross 1997). Occurrences at the Elsinore Peak locale are found on clay soils derived from basalt outcrops or marine sediments; on Poser and Viejas Mountains, occurrences are found on clay soils derived from gabbro. It appears that a constant supply of moisture and low levels of competition from other plants are required by *Sibaropsis hammittii* for successful growth (Boyd and Ross 1997).

Occurrence Status

The two known occurrences for this species are both on the Cleveland National Forest. One is at Elsinore Peak (Trabuco Ranger District) in the grassy areas south and east of the peak, where the species is associated with *Allium munzii* (Munz's onion). The other population is at Viejas and Poser Mountains, where the *Sibaropsis hammittii* is associated with *Acanthomintha ilicifolia* (San Diego thornmint) (Hirshberg 1994). Surveys on Viejas Mountain found seven populations of 25–100 plants and three populations of fewer than 25 plants. Surveys on Poser Mountain found six populations of 25–100 plants and two populations adjacent to National Forest System lands (Hirshberg 1994). More occurrences of *Sibaropsis hammittii* are expected to be found on gabbro and metavolcanic soils in the mountains of San Diego County and northwestern Baja California, Mexico (Stephenson and Calcarone 1999).

OCCURRENCE DATA of *Sibaropsis hammittii* (Hammitt's Clay-cress) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
*	2-1	500+	1994	Viejas and Poser Mtns. / CNF	SD

*	*	500+	1994	knoll just SE of Elsinore Peak / CNF	RIV
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- U = Unknown
- * = an occurrence number has not been assigned
- CNF = Cleveland National Forest
- RIV = Riverside County
- SD = San Diego County

Threats

Threats to some occurrences on Viejas and Poser mountains include unauthorized off road driving, unauthorized cattle grazing, trash dumping, and the potential for Tocalote (*Centaurea melitensis*), a state designated noxious weed, to spread into *Sibaropsis hammittii* habitat. All of the known populations of this species burned in the Cedar fire in the fall of 2003. The impact of the fire on the seed bank for this annual plant is unknown, but the species is expected to regenerate after the fire. However, the open ground created by the fire temporarily exacerbates the potential threats from unauthorized activities and possible spread of Tocalote on Viejas and Poser mountains.

The Elsinore Peak occurrence is adjacent to a Forest system road (6S07), a designated off-highway vehicle (OHV) area, and an electronic site under Special Use Permit. Protection measures (fencing, gating, and monitoring) implemented to keep OHVs from driving over habitat for *Allium munzii*, an endangered species, also protect *Sibaropsis hammittii*. The Elsinore Peak electronic site does not negatively affect *Sibaropsis hammittii*, as the electronic site is confined to the peak, up slope from the habitat. Vehicle use of the access road to the Elsinore Peak electronic site and unauthorized OHV use make the habitat vulnerable to erosion and non-native species invasion. *Avena* sp. (wild oats) and mustard (*Brassica*, *Hirshfeldia*) plants persist at this site (Hirshberg 1994). Because *Sibaropsis hammittii* is a small annual plant, it can also be subject to trampling during botanical surveys (Hirshberg 1994).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Sibaropsis hammittii*:

- Monitor and maintain existing barriers and fence lines.
- Monitor trends in unauthorized uses and work with adjacent landowners as necessary to reduce unauthorized activities on National Forest System lands.
- Monitor potential encroachment of nonnative annual grasses and mustards on Elsinore Peak and tocalote on Viejas and Poser mountains. Consider potential treatments.
- Monitor, survey and map potential habitat and species occurrences in the Cleveland National Forest, and incorporate these occurrences into the Sensitive Plant Atlas.

- Document recovery after the Cedar fire.
- Maintain the geographic and genetic diversity of the species by protecting all known populations on Federal lands.
- Allow wildland fires to freely burn through occurrences. Minimize earth-movement during fire suppression activities. Use existing roads as fuel breaks. The use of hand tools for fire suppression line construction is preferred.
- Do not develop additional trails or other facilities near known occurrences.

Evaluation of Current Situation and Threats on National Forest System Lands

Populations on the Cleveland National Forest appear stable (Stephenson and Calcarone 1999). *Sibaropsis hammittii* is considered to have moderate vulnerability on National Forest System lands due to its restricted habitat, very limited number of occurrences, proximity to an OHV area, roads, presence of invasive nonnative species and effects of unauthorized grazing, off road driving and trash dumping. *Sibaropsis hammittii* occurs with federally listed species at all three CNF locations and measures to protect populations are in place and working; however due to the level of unauthorized use, monitoring for unauthorized use and fence and sign maintenance are needed regularly to ensure habitat is protected. The very limited distribution of this species and its restriction to specialized soil conditions increases the chance that a stochastic damaging event –either natural or human-caused – at one of its population sites could substantially reduce the abundance of this species. Occurrences within the boundary of the Cedar fire are expected to recover from the soil seed bank; however effects remain unknown at this time. There is also a possibility that removal of chaparral species within habitat near Viejas and Poser Mountains promote additional opportunities for unauthorized uses to occur. Activities associated with wildfire suppression, such as fuel break and hand line construction, staging areas are other potential threats to this species.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	C	B	C	A

Sibaropsis hammittii is a USDA Region 5 Forest Service Sensitive species. This assures that any new

project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Protection measures in place for federally listed species where they overlap with *Sibaropsis hammittii* would continue to protect this taxon across all alternatives. Under alternatives 2-6, due to the fact that *Sibaropsis hammittii* occupied habitat overlaps with *Acanthomintha illicifolia* and *Allium munzii* habitat, *Sibaropsis hammittii* would also receive long term protection from the use of the following Standards. CNF Place Standard S13 “avoids or mitigates impacts to *Acanthomintha illicifolia* occupied habitat (Sweetwater Place).” CNF Place Standard S10, states “Future development at Elsinore Peak will be designed to avoid adverse effects to Munz’s onion (Elsinore Place).”

Under Alternative 1, current management of *Sibaropsis hammittii* within Back Country zoning would continue. *Sibaropsis hammittii* habitat overlaps completely with *Acanthomintha illicifolia* and *Allium munzii* habitat. Due to this situation, the conservation recommendations, standards and monitoring of unauthorized activities that apply to *Acanthomintha illicifolia* on Viejas Mt and those that apply to *Allium munzii* on Elsinore Peak under the Southern California Conservation Strategy would remain in place. The Viejas RNA and the Viejas Mountain Critical Biological Land Use zoning are not proposed in this alternative. Elsinore Peak would be zoned as Developed Area Interface.

Under Alternative 2, populations on Viejas Mountain would receive enhanced protection by establishment of the Viejas Research Natural Area (RNA); the entire mountain would also become a Critical Biological land use zone. Populations on Poser Mountain would remain subject to impact within Back Country zoning. Elsinore Peak would be managed under Developed Area Interface and Back Country zoning.

Under Alternative 3, All of Viejas Mountain would become a Critical Biological land use zone and an established Research Natural Area. Much of Poser Mountain and the north side of Elsinore Peak would be zoned Back Country Non-Motorized. The emphasis of this alternative on conservation and recovery of at-risk species increases the likelihood that monitoring would occur, fences would be regularly maintained and unauthorized activities would decrease. Increased focus to reduce the spread of invasive nonnative plants would also occur.

Under Alternative 4, neither the Viejas Research Natural Area nor the Viejas Critical Biological zone is recommended.* Poser Mountain and Elsinore Peak would remain zoned as Back Country. This alternative would provide the most emphasis on all types of recreation. In this alternative, there is a higher level of focus on management of recreation growth including monitoring recreation use and its effects and managing use in order to offset effects of uses on other resources such as wildlife and vegetation, emphasizing enforcement, and public education programs. This alternative would be expected to create a higher level of impacts to *Sibaropsis hammittii* habitat over the long-term because of the emphasis to sustain the recreation resource by maintaining or expanding facilities at a moderate rate with less emphasis on sustainable dispersed recreation.

Under Alternative 4a, a smaller area of Viejas Mountain containing occupied habitat of *Acanthomintha illicifolia* would become a Critical Biological land use zone. This would also protect *Sibaropsis hammittii* habitat where it overlaps with *Acanthomintha illicifolia*. The decision to recommend Viejas Mountain as an Research Natural Area would be deferred to another decision to be made within three years after signature of the Forest Plan Record of Decision. Portions of Viejas Mountain outside of the Critical Biological zone would be managed within a Back Country Non-Motorized zone. Poser Mountain would be zoned Developed Area Interface and Back Country Non-Motorized. The occurrence at Elsinore Peak would be managed under Developed Area Interface and Back Country zoning. Effects under this alternative would be expected to be less than in Alternative 4 as this alternative emphasizes maintenance of the setting through management of dispersed recreation and to maintain or expand existing facilities prior to constructing new ones at a low rate.

Under Alternative 5, Poser and Viejas mountains and Elsinore Peak would all be managed within Back Country zoning. The emphasis of this alternative on increasing motorized recreation may result in increased use of the roads in this area, leading to increased unauthorized off-route travel into plant occurrences. The occurrences on Poser Mountain would be most likely to suffer negative impacts under this alternative. For the Elsinore Peak population, the motorized recreation emphasis under alternative 5 would be expected to bring more people to the designated OHV area located near this occurrence. This in turn may increase incidents of unauthorized off-route vehicle travel in the area occupied by *Sibaropsis hammittii*, increasing the risk that portions of the population could be damaged.

Under Alternative 6, all of Viejas Mountain would become a Critical Biological zone and an established Research Natural Area. Much of Poser Mountain and the north side of Elsinore Peak would be zoned Back Country Non-Motorized. Elsinore Peak would be zoned as Developed Area Interface, and Back Country with Back Country Non-Motorized zoning adjacent to the north. There is a higher level of emphasis on Alternative 6 in low impact recreation, visitor capacity controls, public education and habitat restoration.

* Note: In alternative 4, the FEIS CBZ table does not recommend the Viejas CBZ, however the alt 4 map shows it as recommended. The viability outcome discussion is based on the FEIS table.

Viability Outcomes for All Lands Within the Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	C	B	C	A

Sibaropsis hammittii is considered to have moderate vulnerability across its range. The majority of the habitat is on National Forest System lands; only a small portion overlaps onto private lands. Private land

habitat is vulnerable to effects from urbanization, authorized cattle grazing, trash dumping, increased fire frequency, invasive nonnative species and damage by vehicles. Persistence of this species will likely depend on its protection on National Forest System lands. Therefore, outcomes for this taxon across its range would vary by alternative in the same manner as those on National Forest System lands.

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Sedum niveum

**Sidalcea hickmanii ssp.
anomala**

Sidalcea hickmanii ssp. anomala

Sidalcea hickmanii Greene ssp. *anomala* C. L. Hitchcock (Cuesta Pass checkerbloom)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: Rare

Heritage Rank: G3T1, S1.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Sidalcea hickmanii ssp. *anomala* is endemic to West Cuesta Ridge in San Luis Obispo County (California Natural Diversity Database 2004, Hoover 1970).

Distribution in the Planning Area

The California Natural Diversity Database (2004) contains three records of documented occurrences on the Los Padres National Forest: along Cuesta Ridge on the Ridge Top road northeast of La Trinidad mine, along Cuesta Ridge northwest of Cuesta Pass, and along Cuesta Ridge east-northeast of Dughi Springs. A fourth historic occurrence was collected along Chorro Creek on or adjacent to National Forest System lands (California Natural Diversity Database 2004). *Sidalcea hickmanii* ssp. *anomala* is documented from Camp San Luis Obispo. For more information regarding these occurrences and information on studies done prior to 1976 on Cuesta Ridge see Painter 2004.

Taxonomy and Natural History

Sidalcea hickmanii ssp. *anomala* is one of four subspecies of *S. hickmanii*. The subspecies are distinguished by flower and leaf characters and by their geographic ranges (Hill 1993). *Sidalcea hickmanii* ssp. *viridis* is endemic to the San Francisco Bay Area. *Sidalcea hickmanii* ssp. *parishii*, a Forest Service sensitive species, ranges to the east and to the southeast in the La Panza Range, the San Rafael Mountains, and on Sierra Madre Ridge. *Sidalcea hickmanii* ssp. *hickmanii*, also a rare species, occurs in the northeastern Santa Lucia Mountains of Monterey County.

Sidalcea hickmanii ssp. *anomala* is distinguished by its covering of grayish, stellate-shaped hairs, basal leaves that are often shallowly lobed, and deeply lobed stem leaves. The flowers are pinkish lavender and are subtended by lanceolate bracts. The bracts and bractlets are both $\pm =$ to the calyx. In *Sidalcea hickmanii* ssp. *parishii*, the upper leaves are unlobed or only shallowly lobed. In *Sidalcea hickmanii* ssp. *hickmanii*, the calyx is densely stellate-hairy and the bracts and bractlets are shorter than the calyx.

Sidalcea hickmanii ssp. *anomala* is a perennial herb that blooms in May (California Native Plant Society 2001).

Habitat Description

Sidalcea hickmanii ssp. *anomala* is found on rocky, serpentine soil associated with Sargent cypress forests at elevations of 1,950–2,600 feet (600–800 meters) (California Natural Diversity Database 2002).

Occurrence Status

Populations of *Sidalcea hickmanii* ssp. *anomala* are stable to increasing. Hoover (1970) described the status of *Sidalcea hickmanii* ssp. *anomala* as "locally plentiful along the ridge, especially in cleared spots." In 1994, the Highway 41 Fire burned almost the entire habitat occupied by *Sidalcea hickmanii* ssp. *anomala*. Prior to the fire, the population size was estimated at about 50 plants. After the fire, the population of *Sidalcea hickmanii* ssp. *anomala* exploded producing a population of plants estimated to be in the tens of thousands (Anonymous 2002). Post fire mapping of the plant's distribution showed it to be widely distributed throughout the West Cuesta Ridge area. Apparently a robust seed bank was present in the soil and this seed bank responded favorably to the summer wildfire event of 1994.

Threats

Potential threats to *Sidalcea hickmanii* ssp. *anomala* include fire break construction, vehicle traffic, and parking for target shooting (California Natural Diversity Database 2002). Because of the limited distribution of the taxon, threats also include stochastic events. Some populations are protected within the Cuesta Ridge Botanical Area (Stephenson and Calcarone 1999) but habitat here is still subject to some trampling and use by trespass off trail motor vehicles and bicycles.

Threats and possible threats at Camp San Luis Obispo include small populations, nonnative plants, cattle, feral pigs, feral goat, erosion from mines and tailings, road maintenance, mine and tailings reclamation projects, use of non-local plant materials in re-vegetation projects, fence construction and maintenance, vegetation removal along fence lines and boundaries, firebreak construction and maintenance, too frequent fires, out of season fires, military training activities, vehicles, trampling, soil compaction, dust, proposed pipeline construction, and trespassing bicyclists (Painter 2004).

Conservation and Management Considerations

Measures for protecting the populations could include designated parking for shooting areas with barriers that would discourage disturbance to the plants; restricting target shooting to areas outside of occupied habitat; monitoring populations along roads and near areas with high visitor activity; and signage, visitor education, or other restrictions to control visitor access.

Evaluation of Current Situation and Threats on National Forest System Lands

Sidalcea hickmanii ssp. *anomala* has a very narrow distribution, being endemic to the serpentine substrates of Cuesta Ridge. Within this narrow range, *Sidalcea hickmanii* ssp. *anomala* is locally abundant, especially after wildfire events. Although some habitat may be affected by incidental impacts resulting from various forms of dispersed recreation, there is and is likely to remain considerable amounts of habitat that is unaffected by recreation use and this habitat appears to be sufficient to maintain the plant's historic distribution on National Forest System lands.

Based upon the above analysis *Sidalcea hickmanii* ssp. *anomala* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Sidalcea hickmanii ssp. *anomala* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Sidalcea hickmanii* ssp. *anomala* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for All Land within Range of Taxon

By maintaining the current distribution of *Sidalcea hickmanii* ssp. *anomala* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Sibaropsis hammittii

**Sidalcea hickmanii ssp.
hickmanii**

Sidalcea hickmanii* ssp. *hickmanii

Sidalcea hickmanii Greene ssp. *hickmanii* (Hickman's checkerbloom)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: GT2 S2.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Sidalcea hickmanii ssp. *hickmanii* is endemic to the northern Santa Lucia Range in Monterey County (Hill 1993). The California Natural Diversity Database (2004) lists 13 occurrences, including two at Fort Hunter Liggett. A fourteenth and newly discovered occurrence is reported from the South Coast Ridge Trail above Big Creek (Nelson 2002).

Distribution in the Planning Area

Seven of the known occurrences of *Sidalcea hickmanii* ssp. *hickmanii* are on the Los Padres National Forest (Stephenson and Calcarone 1999). One occurrence is just south of Bear Mountain (Occurrence #5), one is southeast of Bear Mountain (Occurrence #4), one is just south of Junipero Serra Peak (Occurrence #9), one is just south of Hanging Valley (Occurrence #7), one is north of Hanging Valley (Occurrence #8), and the sixth is just north of Tassajara Hot Springs (Occurrence #10). The seventh occurrence is the aforementioned occurrence from the South Coast Ridge Trail.

It is documented from Fort Hunter Liggett by several specimens collected during the Fort Hunter Liggett floristic survey and by other collectors (Painter 2004): Hardham 5588 (SBBG), Hardham 5893 (CAS, RSA, SBBG), Hardham 6271 (CAS, RSA, SBBG), Hardham 7036 (UC), Hardham 7037 (CAS), Hrusa et al. 14549 (CDA, SBBG), Taylor 12621 (JEPS), Yadon s.n. (PGM). It is also documented from Pine Canyon west of King City Hardham 10044 (SBBG). The type specimen was collected in Reliz Canyon (Hickman (s.n. (UC, holotype))).

Taxonomy and Natural History

Sidalcea hickmanii ssp. *hickmanii* is a dicot in the mallow family (Malvaceae). It is one of four subspecies of Hickman's or chaparral checkerbloom that occurs in California. The subspecies are distinguished from one another by flower and leaf characters, the length and density of calyx hairs, and by their geographic ranges (Hill 1993). *Sidalcea hickmanii* ssp. *viridis* is endemic to the San Francisco Bay Area. *Sidalcea hickmanii* ssp. *parishii*, a Forest Service sensitive species, is found farther south in San Luis Obispo and Santa Barbara counties, and in the San Bernardino Mountains. *Sidalcea hickmanii* ssp. *anomala*, also a rare species, occurs on serpentine on West Cuesta Ridge in San Luis Obispo County.

In *Sidalcea hickmanii* ssp. *hickmanii* the distinguishing characters are fan-shaped leaves that are unlobed or shallowly lobed, a calyx that is densely stellate-hairy, and flowers with bracts and bractlets that are shorter than the calyx. The plant has dense gray-stellate hairs throughout (Matthews 1997).

Sidalcea hickmanii ssp. *hickmanii* is a perennial herb that blooms May–July (California Native Plant Society 2001).

Habitat Description

Sidalcea hickmanii ssp. *hickmanii* occurs in grassy openings in chaparral and on dry ridges at elevations of 1,100 to 3,900 feet (335-1,200 meters) (California Native Plant Society 2001).

Occurrence Status

Sidalcea hickmanii ssp. *hickmanii* is distributed in a limited number of occurrences but currently is not considered to be at risk of extinction (California Native Plant Society 2001). Vulnerability on National Forest System lands is thought to be low, although population trends are unknown (Stephenson and Calcarone 1999). Recent survey efforts (2003) indicate that population numbers may be very low (Wilken pers. comm.), as only three plants were found at Occurrence #7 and only 4 plants at Occurrence #8.

OCCURRENCE DATA of *Sidalcea hickmanii* ssp. *hickmanii* (Hickman's checkerbloom)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County

1	U	50-100+ in 1982	1982	JUNCTION OF SAM JONES ROAD AND SALMON CREEK ROAD, NORTH OF THE PALLISADES, FORT HUNTER LIGGETT. SITE IS MAPPED BETWEEN THE NE END OF THE PALLISADES AND THE WEST SIDE OF THE JUNCTION OF THE TWO ROADS.	MON
2	U	U	1961	MOUTH OF LOS BURROS CREEK, 7.5 MILES SOUTHEAST OF JOLON. INCLUDES COLLECTIONS FROM "LOS BURROS CREEK" AND "LOS BURROS CREEK 15 MILES SOUTH OF JOLON".	MON
3	U	U	1962	PINE CANYON, WEST OF KING CITY. MAPPED NEAR THE HEAD OF PINE CANYON.	MON
4	U	U	1977	ABOUT 1.5 MILES SOUTHEAST OF BEAR MOUNTAIN, SANTA LUCIA MOUNTAINS. MAPPED ALONG RIDGETOP IN N 1/2 OF SE 1/4 OF SECTION 31.	MON

5	U	U	1977	<p>BEAR MOUNTAIN, BELOW PINYON PEAK, SANTA LUCIA MOUNTAINS. MAPPED ALONG RIDGETOP AND NORTHEAST UPPER SLOPES WITHIN THE SE 1/4 OF SECTION 25 AND THE NE 1/4 OF SECTION 36.</p>	MON
6	U	U	1955	<p>DIVIDE BETWEEN RELIZ CANYON AND BEAR CANYON, SANTA LUCIA MOUNTAINS.</p> <p>INCLUDES TWO OTHER COLLECTIONS FROM ALONG THIS RIDGE SYSTEM: "RIDGE BETWEEN VAQUERO AND BEAR CANYON" AND "RIDGE BETWEEN RELIZ AND COLMAN CANYONS". COLLECTIONS FROM 3600' TO 3900'. MAPPED LOCATION AT CNDDDB IS BEST GUESS.</p>	MON
7	U	U	1977	<p>ARROYO SECO ROAD NEAR HANGING VALLEY CAMP, SANTA LUCIA MOUNTAINS.</p> <p>MAPPED ABOUT 1.5 MILES NORTH OF ESCONDIDO CAMPGROUND ON BOTH SIDES FO ARROYO SECO ROAD (INDIANS ROAD).</p>	MON

8	U	U	1977	ARROYO SECO ROAD NEAR JACKHAMMER SPRINGS CAMP, SANTA LUCIA MOUNTAINS. MAPPED ALONG BOTH SIDES OF ARROYO SECO ROAD (INDIANS ROAD) ABOUT 3 AIR MILES NORTH OF ESCONDIDO CAMPGROUND.	MON
9	U	U	U	ROAD TO JUNIPERO SERRA PEAK ALONG RIDGETOP, SANTA LUCIA MOUNTAINS. MAPPED ALONG THE SOUTHERN SLOPE OF JUNIPERO SERRA PEAK.	MON
10	U	U	1901	TASSAJARA HOT SPRINGS.	MON
11	U	A few in 1998	1998	ALONG ROAD NEAR TRIBUTARY TO LOS BURROS CREEK, ABOUT 0.8 MILE NORTHWEST OF BURRO MOUNTAIN, FORT HUNTER LIGGETT.	MON
12	U	< 500 in 1997	1997	NEAR BURMA ROAD, ABOUT 0.4 MILE SOUTHEAST OF SYCAMORE SPRING AND 2 MILES SW OF SAN MIGUELITO RANCH, FORT HUNTER LIGGETT. MAPPED ACCORDING TO UTM COORDINATES PROVIDED BY THE CENTER FOR ECOLOGICAL MANAGEMENT FOR	MON

				MILITARY LANDS (CEMML).	
13	U	< 10 in 1997	1996	RIDGE BETWEEN WIZARD GULCH AND STONY CREEK, ABOUT 3 MI SSE OF SAN ANTONIO RIVER AT PINALITA CREEK, FORT HUNTER LIGGETT. MAPPED NEAR RIDGE ROAD ACCORDING TO UTM COORDINATES PROVIDED BY THE CENTER FOR ECOLOGICAL MANAGEMENT FOR MILITARY LANDS (CEMML).	MON

U = Unknown

* = an occurrence number has not been assigned

MON = Monterey

Threats

Possible threats to *Sidalcea hickmanii* ssp. *hickmanii* on National Forest System lands include fire suppression and road maintenance.

Conservation and Management Considerations

Some occurrences of *Sidalcea hickmanii* ssp. *hickmanii* have not been verified in many decades and need to be monitored to determine their status. Cuttings from extant plants may be needed for use in off-site propagation. Plants propagated off-site may be needed to enhance existing occurrences.

Evaluation of Current Situation and Threats on National Forest System Lands

Sidalcea hickmanii ssp. *hickmanii* is a narrow endemic and due to the small size of extant occurrences there may be a risk that occurrences could be affected by road maintenance, fire suppression, and fuels

management.

Based upon the above analysis *Sidalcea hickmanii* ssp. *hickmanii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes For National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	D	B

Sidalcea hickmanii ssp. *hickmanii* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Current habitat conditions appear to be limiting *Sidalcea hickmanii* ssp. *hickmanii* to isolated patches and this condition would continue under alternatives 1, 2, 3, 4, and 4a. Under Alternative 5, increased emphasis on dispersed recreation, especially motor vehicle based recreation, would increase the risk that vehicles, road maintenance, and unauthorized off road travel would affect three of these small populations. Under all alternatives, three occurrences would be in Existing Wilderness (EW) and these occurrences would be less at risk from human impacts. Under alternative 6, the potential to use prescribed fire to benefit this habitat is higher.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	D	B

Across the historic range of *Sidalcea hickmanii* ssp. *hickmanii* there would be large gaps between occurrences. These large gaps would likely be due to the subspecies being inherently rare and not well

distributed, or it may be due to fire suppression preventing opportunities for germination and growth. By maintaining the current distribution of *Sidalcea hickmanii* ssp. *hickmanii* on National Forest System land under Alternatives 1-4a and 6, only Alternative 5 would be expected to contribute substantial adverse cumulative effects that would cause *Sidalcea hickmanii* ssp. *hickmanii* to suffer a decline in its overall distribution. Under Alternative 5, increased emphasis on dispersed recreation, especially motor vehicle based recreation, would increase the risk that vehicles, road maintenance, and unauthorized off road travel would affect three of these small populations on NFS lands. This and the alternative emphasis combined with the low number of occurrences on non-Forest System lands and ongoing effects to these occurrences contribute to the D outcome in Alternative 5.

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Personal Communication

Wilken, D. Rancho Santa Barbara Botanic Garden. [Personal communication with Mike Foster, Forest Botanist, Los Padres National Forest].

Sidalcea hickmanii ssp. anomala	Sidalcea hickmanii ssp. parishii
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Sidalcea hickmanii* ssp. *parishii

Sidalcea hickmanii Greene ssp. *parishii* (Robinson) C. L. Hitchcock (Parish's checkerbloom)

Management Status

Federal: U. S. Fish and Wildlife Service Candidate (U.S. Fish and Wildlife Service 2004, 70 Federal Register 24869, May 11, 2005);

Forest Service Sensitive; Bureau of Land Management Sensitive

California: Rare

Heritage Rank: G3T1 S1.2 – threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-2-3

General Distribution

Sidalcea hickmanii ssp. *parishii* is known from the outer South Coast Ranges, the Western Transverse Ranges, and the San Bernardino Mountains (Hill 1993). The California Natural Diversity Database (2004) lists 15 occurrences in the La Panza Range and the San Rafael, Sierra Madre, and San Bernardino Mountains.

Distribution in the Planning Area

Sidalcea hickmanii ssp. *parishii* occurs on the Los Padres and San Bernardino National Forests and has the potential to occur on the Angeles National Forest (Stephenson and Calcarone 1999). Fourteen of the 15 occurrences in the California Natural Diversity Database (2004) are reported to occur on National Forest System lands.

In 1981, Tim Krantz rediscovered 20 plants in 1981 near Barton Flats, San Bernardino County, where it had last been seen in 1924 by Peirson in a burned area (Krantz 1981). In 1995, a U.S. Forest Service botanist located two other small occurrences near Barton Flats, together supporting eight plants, in the same general area of Krantz's collection and where collections had been made earlier this century. Despite focused surveys for this taxon and wide-ranging surveys conducted to create a flora of the San Bernardino Mountains, no other occurrences had been located in San Bernardino County by the

year 2000 (Krantz et al. 2000). It was predicted that because the plant is a fire follower, that populations would appear if its habitat is burned (Krantz 1981; Munro-Burgess and DePuydt 1993). However, two burns in the Barton Flats area were surveyed for this taxon in 1995 and no plants were found (J. Hirshberg, Forest Service, *in litt.* 1995). This location was also resurveyed in July 2005 by a SBNF botanist with negative results. However, in 2005, a small occurrence was located in the vicinity of the Santa Ana River on the San Bernardino National Forest (Hawke pers. comm.).

One additional occurrence consisting of six plants was discovered in 2002 at Hawe's Ranch, near Little Pine Flat, on the San Bernardino National Forest. This occurrence is transmontane, about 12 air miles to the northeast of the Santa Ana River occurrences, and separated by many miles of presumably unsuitable montane coniferous forest habitats. This area burned in the Willow Fire in 1999. In July of 2005, approximately 1,000 plants were found upslope adjacent to this location (USDA Forest Service 2005b).

On the Los Padres National Forest, *Sidalcea hickmanii* ssp. *parishii* occurs on the Santa Lucia Ranger District (American Canyon in the La Panza Range and along Sierra Madre Ridge), the Santa Barbara Ranger District (San Rafael Mountains from Hell's Half Acre to McKinley Mountain to Big Pine Mountain), and the Mount Pinos Ranger District (Sierra Madre Ridge from McPherson Peak to west of Montgomery Potrero).

Taxonomy and Natural History

Sidalcea hickmanii ssp. *parishii* is a dicot in the mallow family (Malvaceae). It is one of four subspecies of *Sidalcea hickmanii* that occur in California. *Sidalcea hickmanii* ssp. *parishii* is distinguished from subspecies *hickmanii*, *viridis*, and *anomala* primarily by leaf and bract shape (Hill 1993).

Sidalcea hickmanii ssp. *parishii* is a perennial herb that blooms June-August (California Native Plant Society 2001).

Sidalcea hickmanii ssp. *parishii* is a fire-follower. Reports that *Sidalcea hickmanii* ssp. *parishii* is favored by other forms of disturbance such as grazing, hazard reduction at communication sites, trail construction, and fuelbreak maintenance may be based on a misunderstanding of the taxon's life history. After wildfire events, very large numbers of seeds germinate producing many hundreds if not thousands of seedling plants. In the several years after the wildfire, many of these seedlings are able to survive and as they mature they produce flowers and seeds. In the course of several decades, competition from large, longer-lived shrubs ultimately shade out and kill the vast majority of *Sidalcea hickmanii* ssp. *parishii* plants. After a period of many decades, wildfire will usually occur again and start the cycle again. It is the presence of seeds in the seed bank that is probably the most important reservoir of genetic material for the next generation of plants. The presence of remnant islands of *Sidalcea hickmanii* ssp. *parishii* where 5-40 plants exist on human-disturbed landscapes may not be important to the long-term viability of the taxon. However, this model is speculative and based only on a few

observations of how the species has responded to past wildfire events.

Habitat Description

Sidalcea hickmanii ssp. *parishii* grows in chaparral, cismontane woodland, and montane conifer habitat at elevations of 3,300–8,200 feet (1,000–2,500 meters) (California Native Plant Society 2001). Habitat for *Sidalcea hickmanii* ssp. *parishii* varies over time in response to wildfire and the post-fire response of the vegetation. Dense, mature stands of chaparral and woodland are generally unsuitable for *Sidalcea hickmanii* ssp. *parishii* until after wildfire has removed the bulk of the competing vegetation. *Sidalcea hickmanii* ssp. *parishii* may remain on-site after vegetative recovery has occurred but only in open areas – areas that are usually subject to some sort of periodic disturbance other than fire. Roadsides, cut road banks, and fuelbreaks often provide this type of disturbed habitat.

Occurrence Status

Sidalcea hickmanii ssp. *parishii* is distributed in several highly restricted occurrences and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). The distribution of *Sidalcea hickmanii* ssp. *parishii* is moderately well known on National Forest System lands, but its population trends are generally unknown (Stephenson and Calcarone 1999).

Observations of *Sidalcea hickmanii* ssp. *parishii*, grouped by general location and listed in chronological order within each group.

In Santa Barbara County, this taxon is known from three regions in Los Padres National Forest -- Big Pine Mountain, Sierra Madre Ridge, and McKinley Peak.

General Location 1- Hawe's Ranch, San Bernardino County

Occurrence No. (CNDDDB)	No. of Plants	Year Reported/Source (collector)	Location/Land Owner
None assigned	6 1000	2002 (Soza, Gross), 2004 (Kopp) 2005 (VinZant)	In burned area, along Cox Creek, 0.25 mile northeast of Hawes Ranch. On north facing hillsides, south of Cox Creek and east of Hawe's Ranch in 1999 Willow Fire area. Adjacent to occurrence above.

General Location 2 – Seven Oaks/Forsee Creek, Santa Ana River, San Bernardino County

Occurrence No. (CNDDDB)	No. of Plants	Year Reported/Source (collector)	Location/Land Owner
9	n/a	June 25, 1895 Bennet 1979 (Parish 3786)	Near Seven Oaks. At CNDDDB mapped near the Seven Oaks Resort; surveyors should also consider checking along the Converse River and near the town of Seven Oaks.
10?	n/a	June 25, 1895 Bennet 1979 (Parish 3925)	Forsee Creek near Seven Oaks
10?	n/a	August 26, 1920 Bennet 1979 (Peirson 2251)	Road crossing over Forsee Creek
10?	n/a	June 11, 1901 Bennet 1979 (Grant 4026)	Seven Oaks Camp
10 Includes former occurrence #12	n/a	June 24, 1922 Bennet 1979 (Peirson 4697) 2005 (VinZant)	Along Hwy 38 where it crosses forsee creek W of Barton Flats. Dry soil in small clearing, Forsee Creek. Not found in 2005, possibly due to increased canopy cover

10?	n/a	August 27, 1922 Bennet 1979 (Munz 6339)	Dry roadside, Forsee Creek
13	n/a	June 25, 1895 Bennet 1979 (Parish 3786)	Western slope of Mt. San Bernardino
15 and 16 Includes former occurrence #17.	< 20 8	July 16, 1924 July 17, 1924 July 21, 1987 July 17, 1995 Bennet 1979, Peirson 4971, Krantz 1981, and Hirschberg 1995 July 2005 (VinZant)	West of Barton Flats, T1N, R1W, Sec. 13. Part of population found above lowest switchback on Hill Ranch Rd., on granitic and gneissic rock associated with <i>Pinus coulteri</i> , <i>Quercus chrysolepis</i> and <i>Quercus kelloggii</i> . Sunny openings, clearing at edge of trail, on eroding bank, burned area, recent burn in chaparral. Site may have been converted to volleyball court (Sanders 1993). Not relocated in 2005. Chaparral has re-vegetated area. Greater canopy cover, with open areas dominated by cheatgrass may have lead to unsuitable habitat.

General Location 3 – Yucaipa, San Bernardino County

Occurrence No. (CNDDDB)	No. of Plants	Year Reported/Source (collector)	Location/Land Owner
None assigned	n/a	June 25, 1909 SMASCH (Reed 2755)	San Antonio Power Company pipeline trail

General Location 4– McKinley Mountain, Santa Barbara County

Occurrence No. (CNDDDB)	No. of Plants	Year Reported/Source (collector)	Location/Land Owner
3?	n/a	June 6, 1929 CalFlora (Hoffman)	Burned over tract at McKinley Mountain
	n/a	July 25, 1930 Hitchcock 1957 (Hoffman)	Open rocky slope, summit, Mission Pine
3?	n/a	May 27 1961 CalFlora (Smith 6393)	In disturbed ground along road in chaparral
3	n/a	June 1, 1961 SMASCH (Blakely 4478)	NW side of McKinley Mountain, 1000 ft W of Cold Springs
2 Includes former EO#3.	Few plants seen in 1961. 600+ observed in 1993, 1994. Plants in road that showed damage in 1993 did not come up in 1994.	June 12, 1961 SMASCH (Blakely 4475) 1994	In sun, in disturbed ground at side of road, saddle between McKinley and San Rafael Mts.
None assigned		July 30, 1976 CalFlora (Smith 11035)	Along fire road, Just E of Hell's Half Acre between Cachuma Saddle and McKinley Mountain
	600+	1993 Munro	McKinley Mountain

General Location 5– Big Pine Mountain, Santa Barbara County

Occurrence No. (CNDDDB)	No. of Plants	Year Reported/Source (collector)	Location/Land Owner
8	No plants observed in 1993	July 7, 1929 July 7, 1936 July 29, 1937 CalFlora (Hoffman), (Peterson 291), CalFlora (Bartholomew) 1993 (Munro)	Big Pine Mountain, San Rafael Mtns. on open banks, especially in burned areas (1936). LPNF T7N, R26W
14		1930	Mission Pine, San Rafael Mtns.. Exact location not known; site mapped as general to include Mission Pine campground, Mission Pine Basin, and Mission Pine. rocky summit. LPNF.

General Location 6 – Sierra Madre Ridge, Santa Barbara County

Occurrence No. (CNDDDB)	No. of Plants	Year Reported/ Source (collector)	Location/Land Owner
7?		June 6, 1957 CalFlora (Smith 5533)	In disturbed ground along the road in chaparral on road to McPherson Peak, ~2 miles W of Montgomery Potrero

7	21 plants in E. colony in 1993, 23 in 1994. unknown number in W. colony.	June 29, 1963 CalFlora (Blakely 6078) 1994	McPherson Peak, Sierra Madre Mtns. Two colonies reported; East side of peak South of Deer Spring and along road about .25 mi. West (NW?) of peak. Heavy grazing , road use numerous broken bottles. (Burgess) LPNF.
1	Less than 100 plants seen in 1981, 13 in 1993, 13 in 1994.	June 4, 1964 CalFlora (Smith 8479) 1994	On heliport along Sierra Madre Ridge Road, ~ 1 mile W of summit of Bates Canyon Road North of Montgomery Potrero near Branch Cyn., about 0.7 mi. WNW of Upper Branch Cyn. Spring, Sierra Madre Mtns. Mapped along trail just N. of Montgomery benchmark. Grazing, trampling by livestock, erosion of cut bank of road, and gopher problem. (Burgess) LPNF.
5? (should be 1)		June 4, 1964 CalFlora (Chandler 2015)	On disturbed ground near head of Bates Canyon
5	4 plants observed in 1993, 1 plant 1994.	June 24, 1964 CalFlora (Smith 8558) 1994	Sierra Madre ridge road near head of Bates Cyn., Sierra Madre Mtns. Mapped along jeep trail just W. of road to Cole Spring Campground(although directions by Burgess state that it is 0.4 miles W. of Jct.(Burgess)
4		June 12, 1968 CalFlora (Chandler 3792)	In burn area, ~ 2 miles W of Bates Canyon

5?		June 29, 1977 CalFlora (Smith 11086)	On fuelbreak in chaparral, crest of Sierra Madre Mountains at junction with Bates Canyon Road
18	Less than 50 plants seen in 1981, 12 IN 1993, 9 IN 1994.	July 14, 1981 Budzinski Field Survey Form 1994	Along long sierra Madre Rd. about 0.7 air miles ESE of Abel Cyn. Spring, just W. of Hog benchmark. Along road and slightly down slope from road, T9N, R27W, Sect.18. Upper slope brush encroachment, grazing road work, and erosion threats. LPNF.
19	1	1993	West of McKinley Mtn. along Cachuma Mtn. Rd. about 1.3 miles WNW of summit, San Rafael Mtns. 6.8 mi. E. of locked gate. Mapped along SE side of road within the SW 1/4 SE 1/4 sect. 6. LPNF.
None assigned	51-100	August 1, 1981 Budzinski Field Survey Form	On fuelbreak adjacent to road and cut bank of road
None assigned	49	July 2-4, 27, 1993 Munro-Burgess & DePuydt	Along road, on banks, on fuelbreak, at cleared site at McPherson Peak; five colonies total along about 15 miles of road from Montgomery Peak to ~ 1/4 mile W of Bates Canyon junction
None assigned	45	July 2-3, 1994 Munro	Same as above

None assigned	80-120	August 13, 1998 Steeck	Same as above
		Foster	McPherson Peak Communication Site
		June 7, 2003, Foster	McPherson Peak Communication Site

General Location 7 – American Canyon, San Luis Obispo County

Occurrence No. (CNDDDB)	No. of Plants	Year Reported/Source (collector)	Location/Land Owner
None assigned	< 20 plants	May – July 1988, 1989 Schettler	In 1-2 potreros
20	Locally common, 100's	May 15, 1997 Keil (26257)	Fringe of Machesna wilderness, ridge along road past Castle Crag, La Panza Mtns. On burned slopes.
None assigned	3000-5000	September 3-5, 1998 Rodriguez	On 80 acres of burned slopes

The Forest Service conducted surveys for this plant in 1993 and 1994 and located no plants at Big Pine Mountain, where historical collections were made in the 1930s. On McKinley Peak, a single large occurrence of about 600 individuals was re-located. On Sierra Madre Ridge, four small occurrences (of between 13 and 25 plants) were found, corresponding to the locations of historical collections. Two of the four smaller occurrences located during these surveys exhibited severe damage from cattle grazing and two were potentially threatened by road widening and grading (Munro-Burgess and DePuydt 1993). One population on Sierra Madre Ridge is adjacent to, and partially within, a communications facility and was repeatedly exposed to herbicides (B. Hitchins, Edwards Air Force Base, pers. comm.

1994) in the 1970s. There were 21 plants at this location in 1993, 12 plants in 1998, 28 in 2002, and 27 in 2003.

In May 1997, a population of *Sidalcea hickmanii* ssp. *parishii* was found in San Luis Obispo County, on National Forest land. This site had been burned the previous year and represents a County from which this taxon had not been previously collected. The Forest Service conducted additional surveys of burned areas in September 1998. Results are still being compiled. This extension of the known range of this taxon is substantial and increases the likelihood that additional populations have yet to be discovered on intervening, undeveloped, public lands.

Threats

Sidalcea hickmanii ssp. *parishii* is considered to have high vulnerability on the San Bernardino National Forest and moderate vulnerability on the Los Padres National Forest (Stephenson and Calcarone 1999). On private lands, the taxon is vulnerable to development projects that destroy its habitat (California Native Plant Society 2001).

Up until July 2005, fewer than 10 plants were currently known from the southern portion of this taxon's range in San Bernardino National Forest. In 2005, approximately 1,000 plants were observed upslope from the Hawe's Ranch locality. In some locations on the Forest, there is potential for erosion and encroachment of brush to affect occurrences (Stephenson and Calcarone 1999). The species is threatened with extirpation on the San Bernardino National Forest because of its rarity (Lardner and others 1998). The plant is found only rarely and seldom in the same locations; accordingly, it is difficult to manage the species without knowing where seed banks occur or where it may reappear again. Because members of the *Sidalcea hickmanii* complex often emerge following fires, it is possible that other occurrences remain undetected in the area. However, San Bernardino National Forest is located within a two-hour drive of 14 million people, has one of the highest visitor rates in the nation, and receives substantial impacts from recreational visitors (Forest Service 1988). Recreationists heavily use the area of the San Bernardino Mountains where historical collections were made near Seven Oaks and Barton Flats. Barton Flats supports campgrounds and group camps for over 500 visitors, 14 additional organizations' camps, 100 recreational residence cabins, and primary access roads and trails into the San Gorgonio Wilderness (Forest Service 1988). The occurrence of *S. hickmanii* ssp. *parishii* discovered in 1981 was located near a campground, and the disappearance of part of it in following years appears to have been caused by expansion of a camp volleyball court (T. Krantz, *in litt.* 1993). Vegetation and fuels management projects are a threat to all of this species' habitat in the San Bernardino National Forest. Planned fuels treatments are lesser of a threat to the Hawe's Ranch location due to its location away from WUI defense zones. In this location, the greater threat may be the creation of dozer lines during emergency fire suppression actions.

On the Los Padres National Forest, *Sidalcea hickmanii* ssp. *parishii* is threatened by grazing, trampling, erosion, native herbivores, road maintenance, and brush encroachment (Lardner and others 1998). Cattle grazing on the Branch Allotment threatens known occurrences and trampling by cattle is a potential

threat. In 1993 surveys, plants in two of the five populations in the allotment were severely grazed. In one population, eight of the plants occurred on a steep slope that was inaccessible to cattle; of the five plants accessible to cattle, three were protected within wire experimental cages and were about 2 feet tall, the remaining two plants had been grazed down to 4 to 6 inches (Munro-Burgess and DePuydt 1993). In the second population, 17 of the 20 plants had been grazed down to 2 inches in height. Cattle feces and hoof prints in the population suggested that the grazing was done by cattle (Munro-Burgess and DePuydt 1993). Currently, three of the four general locations where *Sidalcea hickmanii* ssp. *parishii* occurs are not subject to cattle grazing.

In surveys conducted in 1993, Munro-Burgess and DePuydt (1993) recorded that road maintenance activity had either damaged or buried all four of the plants found at one of the five populations. This population is one of two that are not in active cattle grazing allotments. Plants at one other population also occur along a roadside and are vulnerable to road maintenance activities. Maintenance of a McPherson Peak communication facility impacts one population. Construction activities in November 1996 were carefully conducted to avoid destroying any individual plants, however solar panels, antennas and an entrance road are currently within or bisect the population. Operators of the communication site are aware of the need to protect all *Sidalcea hickmanii* ssp. *parishii* plants and conditions have been added to their special use permits requiring that all operations be carried out in a manner that conserves existing plants. Regardless, the habitat at this site is no longer suitable for the long-term occupation of the site by *Sidalcea hickmanii* ssp. *parishii* and the contribution that these plants make to the viability of the taxon is limited.

Brush encroachment, or the absence of fire, is probably the most widespread threat to *Sidalcea hickmanii* ssp. *parishii*. For all but one of the areas on the Los Padres National Forest where *Sidalcea hickmanii* ssp. *parishii* occurs, there has been a fire free period of between 47 and 81 years. The absence of fire for four or more decades is the most probable reason that these known populations have declined.

Fire history for locations where *Sidalcea hickmanii* ssp. *parishii* has been reported on the Los Padres National Forest

Location	Year of Last Fire
1 mile West of Bates Canyon	1966
Head of Bates Canyon	1922
McPherson Peak	1966
Hog Pen Peak	1966

Montgomery Peak	1928
Big Pine Mountain	1933
Mission Pines	1923
McKinley Spring/San Rafael Peak	1923
McKinley Mountain	1923/1993
Hell's Half Acre	1966/1993
Cachuma Mountain	1966
American Canyon	1995

Conservation and Management Considerations

- Gather additional information on the life history and taxonomic relationships within the *S. hickmanii* complex. For instance: Conduct research on the factors affecting seed germination in this taxon. Conduct soil seedbank analyses in the San Bernardino National Forest in the Seven Oaks/Forsee Creek area surrounding the plants located by Krantz in 1981 and Hirshberg in 1995. Use seed collected from plants in San Luis Obispo County for laboratory studies on germination as this is likely to be the most abundant seed source. Consider also the Hawe's Ranch location on the SBNF.
- Prepare a Candidate Conservation Agreement in cooperation with Fish and Wildlife Service.
- Unless shown otherwise through sampling of the seedbank, assume that a seedbank exists within at least a ½-mile radius of all documented occurrences and in areas of suitable habitat and evaluate habitat disturbing activities accordingly. There is a high potential for existence of a soil seedbank more or less continuously along Sierra Madre Ridge Road between known occurrences.
- Create a conservation seed collection in long-term storage at one of the seed storage facilities cooperating with the Center for Plant Conservation.
- Determine the response of *S. hickmanii* ssp. *parishii* to prescribed fires experimentally, before subjecting an entire population area to prescribed fire.
- Avoid the use of prescribed fire in the spring, winter, or under atypical conditions in the areas surrounding occurrences unless experimental techniques on *S. hickmanii* ssp. *parishii* suggests *S. hickmanii* ssp. *parishii* will not be negatively affected by the conditions of such a burn.
- Survey areas of potential habitat, particularly in the first five years following fires.

- Conduct post fire surveys within the July 2005 fire just north of Barton Flats Visitor Center on the SBNF.
- In Santa Barbara County, particularly along Sierra Madre Ridge Road, the uncertainty about the extent of the seedbank versus the extent of above-ground plants makes management of small, roadside occurrences difficult. Any plants destroyed by road grading or severely damaged by cattle will not be contributing to the seedbank from which they emerged. Without additional information on potential surrounding soil seedbanks, management should be conservative. Existing occurrences should be managed to maintain existing individuals and any new recruits; if necessary, use physical protection measures to protect plants from livestock grazing and road grading.
- Compile information on surveys being conducted on the LP and SBNF in FY 05. Revise this account and update as necessary for use in FS management and to include this account into future biological evaluations.
- In addition to protection measures listed above, ensure plants that appear after fires are protected to maturity to produce and bank seeds. Install barriers, implement area closures or other measures as necessary to prevent unauthorized vehicle access to sites. Consider potential effects to established seed bank during Burned Area Emergency Rehabilitation assessment in known locations of the taxon.

Evaluation of Current Situation and Threats on National Forest Management Lands

Sidalcea hickmanii ssp. *parishii* has a spotty distribution, with isolated occurrences in several mountain ranges. Three of these ranges are on the Los Padres National Forest and one is on the San Bernardino National Forest. Most of these occurrences are small in size and apparently susceptible to impacts from road maintenance and dispersed recreation. All but one of the known occurrences is found on National Forest System lands.

Based upon the above analysis *Sidalcea hickmanii* ssp. *parishii* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	B	C	C	D	C

Sidalcea hickmanii var. *parishii* is a federal candidate, which assures that any consultation at the programmatic level will include this taxon. In the Biological Assessment for the Forest Plan Revision (a programmatic consultation), the USFS included this taxon (USDA Forest Service 2005a). In site-specific projects, this taxon has status as a Region 5 Sensitive species which assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

On the San Bernardino National Forest, Under Alternatives 1 and 5, the Hawes Ranch occurrence within Cox Creek is zoned Back Country and no special area designations are recommended that would increase protection. In Alternatives 2, 4, 4a and 6; it is zoned Back Country Non-Motorized, and in 3 it is recommended wilderness. Under all alternatives, the Santa Ana River watershed occurrences are zoned as Developed Area Interface. In addition, in Alternatives 3 and 6, this locality is also recommended as the Upper Santa Ana River Special Interest Area. In Alternatives 2-4a and 6 the western portion of the habitat is located within an eligible Santa Ana River Wild and Scenic River corridor.

On the Los Padres National Forest, current habitat conditions appear to be limiting *Sidalcea hickmanii* ssp. *parishii* to isolated patches and this condition would continue under alternatives 1, 2, 3, 4 and 4a. Under all alternatives, the occurrence of *Sidalcea hickmanii* ssp. *parishii* at American Canyon would be within the existing Machesna Wilderness and the Big Pine Mountain occurrence would be within Existing Wilderness and the Back Country land use zone. In Alternative 4a, besides occurring in the Machesna Wilderness, a portion of the American Canyon occurrence is located within the existing American Canyon Research Natural Area. Within the Big Pine Mountain population, one occurrence would be located within the recommended Big Pine Mountain Research Natural Area, with a portion of this occurrence located within the existing San Rafael Wilderness and Back Country Motorized Use Restricted land use zone. The precise location of the historical occurrence, CNDDDB#14 is unclear; however it may be within or near the Sisquoc proposed Wild and Scenic River corridor. The Sierra Madre Ridge occurrence would be located within Back Country, Back Country Motorized Use Restricted and the existing San Raphael Wilderness. No special designations are recommended within the boundary of this occurrence. Under Alternative 6, four occurrences (#2, #3, #7, and #18) of *Sidalcea hickmanii* ssp. *parishii* (on Sierra Madre Ridge and McKinley Mountain) would receive the highest level of protection within Back Country Non-Motorized land use zones making them less susceptible to impacts from dispersed recreation and road maintenance. Under Alternative 4a, these locations would the next highest level of protection from motor based recreation under management under a combination of Back Country Motorized Use Restricted, Back Country Non-Motorized, and Back Country land use zones. Under Alternatives 1-5 these occurrences would be managed within the Back Country land use zone where they would remain susceptible to motorized based recreation and road maintenance. Under Alternative 5, increased emphasis on dispersed recreation, especially motor vehicle based recreation, would increase the risk that vehicles, road maintenance, and unauthorized off road travel would affect these small populations.

Across the known range of this taxon, Alternatives 3 and 6 would provide the most protection from the threat of motorized recreation and associated threats related to roads under a combination of Back

Country Non-Motorized zoning, Special Interest Area and Research Natural Area recommendations, and a wilderness recommendation under Alternative 3. Under Alternative 4a the use of Back Country Motorized Use Restricted zoning provides a higher level of habitat protection over Alternatives 1, 2, 4 and 5 in most localities. Consideration of the Suitable Use restricting vehicle travel to Forest System roads and trails, along with Standards related to rare plant management, grazing, and recreation management also factor into the outcomes.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	D	C

Current knowledge indicates that most occurrences are located on NFS lands within the San Bernardino and Los Padres National Forests. Private occurrences in the Santa Ana watershed on the SBNF are subject to future camp developments and expansions over the life of the plan which may result in loss of occupied and suitable habitat. Findings from additional surveys and study of this taxon planned for the near future on NFS lands, is expected to improve management on the SBNF and LPNF over the long term, however there may be a loss of occurrences on private lands over the life of the plan. By maintaining the current distribution of this taxon on NFS lands under Alternatives 1-4a and 6, only the motorized land use zoning and the alternative emphasis in Alternative 5 could contribute to cumulative effects that would cause the species to suffer a decline in its overall distribution from FS activities. These factors contributed to the D outcome in this alternative.

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**Sidalcea hickmanii ssp.
hickmanii**

Sidalcea pedata

Sidalcea pedata

Sidalcea pedata A. Gray (Bird-footed checkerbloom)

Management Status

Federal: Endangered

California: Endangered

Heritage Rank: G1; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

There is no Critical Habitat designated or proposed for this species.

General Distribution

Sidalcea pedata is endemic to the San Bernardino Mountains in Big Bear Valley and surrounding areas including Baldwin Lake to the east, and Bluff Lake to the south (U.S. Fish and Wildlife Service 1998). The plant is currently reported from 10–17 occurrences (U.S. Fish and Wildlife Service 1998; California Natural Diversity Database 2004).

Distribution in the Planning Area

Sidalcea pedata is known from just a few occurrences on National Forest System lands in the San Bernardino National Forest. One occurrence is at Ski Beach on the southwest shore of Big Bear Lake. A second occurrence is along Metcalf Creek at Coldbrook Campground, but contains only a single individual. An occurrence along the south shore of Baldwin Lake is partly on National Forest System lands. A fourth occurrence is located in Lodgepole Meadow on NFS lands west of Bluff Lake and is part of the Bluff Lake occurrence.

A fifth occurrence consists of plants transplanted into Belleville Meadow, but this occurrence may no longer be extant. In the early 1980s (before federal listing), 12 *Sidalcea pedata* plants were transplanted here from a site that had a pending development. Several searches to find the plants in recent years have failed. Two individuals of *Sidalcea pedata* were found in 1999. The current status of these plants is not known at this time. A historical occurrence in Deep Creek Valley near Arrowbear is believed to be

extirpated (California Natural Diversity Database 2004); if found to be extant, this occurrence would represent a significant westward extension of the range.

Taxonomy and Natural History

Sidalcea pedata is a dicotyledon in the mallow family (Malvaceae). It is distinguished from other checkerbloom species by its perennial life cycle, leaves clustered near the base, spike-like inflorescences, and deeply dissected leaves (Hill 1993).

Sidalcea pedata is a perennial herb that blooms May-August (California Native Plant Society 2001). This species is gynodioecious and attracts specific pollinators (Leong pers. comm.). The seeds are small, and seed dispersal is probably limited to areas surrounding the parent plant (U.S. Fish and Wildlife Service 1998).

Sidalcea pedata is a perennial from a fleshy taproot. The stems are 2-4 dm, long-bristly, and somewhat stellate near the base. All but 1-3 leaves are basal with more or less ternate lobes and linear to elliptic segments. The inflorescence is spike-like, and the upper flowers are crowded. The calyx is 4-7 mm, uniformly finely stellate, and with longer marginal hairs. The petals are 9-12 mm, deep rose-pink, and have darker veins. The fruit segment is approximately 2.5 mm, smooth, and more or less beakless (Hill 1993).

Habitat Description

Sidalcea pedata inhabits moist, undisturbed soils in vernal moist montane meadows and seeps, sparsely vegetated drier meadows, and the edges of pebble plains in open woodlands at elevations of 5,200-8,125 ft (1600-2500 m) (USDA Forest Service 2002; California Native Plant Society 2001; California Natural Diversity Database 2004). It tends to occupy the drier portions of these habitats and is generally not found in swales that are densely vegetated by rushes and sedges (U.S. Fish and Wildlife Service 1998). *Sidalcea pedata* has been found in association with *Achillea millefolium*, *Elymus trachycaulus* ssp. *trachycaulus*, *Lupinus confertus*, *Potentilla gracilis*, *Danthonia cespitosa* ssp. *cespitosa*, *Taraxacum californicum*, *Poa pratensis*, and several other graminoid species (USDA Forest Service 2002).

There are approximately 4,430 acres of meadow habitat distributed in the San Bernardino and San Jacinto mountains (USDA Forest Service 2002). Meadow habitat is sensitive to activities that alter hydrology, remove vegetation, or cause soil erosion, especially during the winter and spring when the ground is most saturated. In meadow systems, particularly those on steeper slopes, erosion removes topsoil and fine-textured alluvium, resulting in gully formation. The resulting channelized surface runoff causes increased erosion and stream incision, channeling water away from the meadow and effectively lowering the water table. Over time, increased drainage of meadow soils can lead to a shift in floristic composition to more drought-tolerant species and tree and shrub species.

Grazing and trampling by livestock and other ground disturbances by recreational users such as hikers, mountain bikers, and vehicle use off classified roads encourage the establishment and spread of non-native species which degrade meadow habitat (USDA Forest Service 2002).

Occurrence Status

Sidalcea pedata has been extirpated from at least six sites, and populations on private land are generally declining (U.S. Fish and Wildlife Service 1998, California Natural Diversity Database 2004). Meadows are often lost to development, upstream water diversion, and channelization. Many major occurrences on private land are at imminent risk of loss or chronic degradation. California Endangered Species Act and Section 404 Clean Water Act restrictions have not effectively reduced these risks.

On National Forest System lands, the occurrences at South Baldwin Lake and Ski Beach (Big Bear Lake) appear to be increasing, although plant numbers vary annually depending on precipitation and habitat conditions. Monitoring estimates from 1989-1999 suggest individual plants vary between 450 and 1800 plants in the Ski Beach occurrence (USDA Forest Service 2000). The South Baldwin Lake occurrence is estimated to consist of 50 individuals. The Lodgepole Pine Meadow consists of ten individuals on NFS lands, there are more on the adjacent private lands at Bluff Lake Meadow. Two occurrences on National Forest System lands each consist of only one or two individuals (USDA Forest Service 2000).

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Sidalcea pedata* (Bird-foot checkerbloom)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1990	N end Baldwin Lake, Bear Valley. San Bernardino Mtns. Part of Baldwin Lake Ecological Reserve. Pebble plain meadow on saline clay w/ quartzite. w/ <i>Thelypodium stenopetalum</i> , <i>Poa atropurpurea</i> , <i>Taraxacum californicum</i> . Also w/ <i>Distichlis spicata</i> , <i>Iva axillaris</i> , <i>Poa pratensis</i> , <i>P. fendleriana</i> , <i>Agropyron intermedium</i> , <i>Hordeum californicum</i> , <i>Carex athrostachya</i> , <i>C. praegracilis</i> ,	SBD

			<i>Juncus balticus</i> . Upstream development is a threat to springs. ORVs, unauthorized woodcutting, quartzite theft are management problems. Site is partially fenced. TNC/SBNF/CDFG.	
2	U	1978	Deer Lick, Deep Creek Valley in the San Bernardino Mountains (near Arrowbear). Area searched in 1978. Meadow is gone and no plants were seen. Possibly extirpated. SBNF.	SBD
4	0	1939	Bear Valley Golf Course (area is now the community of Moonridge). Extirpated. Land owner: U.	SBD
5	< 2000 in 1979 on 6 acres	1988	Big Bear Lake, from Eagle Point to 0.5 mi. W of Stanfield Cutoff. On dense loamy clay in annually wet meadow. w/ Jeffrey pine, juniper, <i>Castilleja cinerea</i> , <i>Ivesia argyrocoma</i> , <i>Mimulus exiguus</i> , <i>Mimulus purpureus</i> , <i>Packera bernardina</i> , <i>Taraxacum californicum</i> , <i>Thelypodium stenopetalum</i> , <i>Perideridia parishii parishii</i> , <i>Poa atropurpurea</i> . Part of population destroyed in 1980 by development. Heavy ORV use and development. Portion of habitat to be managed by TNC. Incl. former occ. 19. PVT/TNC.	SBD

6	~8000 in 1979	1988	<p>Bluff Lake Meadow, E of Bluff Lake, Bear Valley, San Bernardino Mtns. Formerly used to graze horses; formerly owned by Pasadena YMCA and used as a camp. Two subpopulations in drier meadow on sandy loam soil. Horses removed from meadow in 1986? Occurrence seems to be recovering. <i>Sidalcea pedata</i> now inhabits formerly disturbed areas. w/ <i>Carex athrostachya</i>, <i>Juncus subfusca</i>, <i>Polygonum douglasii</i>, <i>Phelum pratense</i>, <i>Potentilla glandulosa</i>, <i>Aster occidentalis</i>. Incl. former occ. 16. PVT-The Wildlands Conservancy. Ten plants observed west of here in Lodgepole meadow on SBNF land in 2000. They are included in CNDDDB occurrence 6.</p>	SBD
7	< 40 in 1979	1979	<p>S shore of Big Bear Lake, from Mallard Lagoon SE 0.5 mi. (between Hwy 18 and Lakeview Drive). On sandy loam soil near springs, drainage ditches, and lake shore. Also a few small pockets on vacant lots among houses. w/ <i>Pinus jeffreyi</i>, <i>Salix</i> sp., <i>Artemisia tridentata</i>, <i>Castilleja cinerea</i>, <i>Packera bernardina</i>, <i>Carex</i> spp., <i>Perideridia parishii parishii</i>. Incl. former occ. 14. PVT threatened by development, grazing.</p>	SBD

8	U	1986	S of Baldwin Lake, Bear Valley, San Bernardino Mtns. Two populations seen in 1978. 4-acre area is in very good condition (Eliason pers. comm.). Site is heavily grazed by horses in other areas. In 1986, no plants were seen where horses were allowed to graze. PVT w/ the exception of a 4-acre area on the SBNF. T2N/R2E/S7: scarce in ungrazed meadow area just north of fenceline (White/RSA)	SBD
9	< 10 in 1981; 'few' in 1983	1983	E side of Baldwin Lake, Bear Valley, San Bernardino Mtns. Mapped as 3 separate polygons. PVT.	SBD
10	0	U	Big Bear Lake vicinity, 0.3 mi. SSW of Simmons Trout Lake, San Bernardino Mtns. Mapped w/ several other rare plant taxa. Extirpated (Krantz, et. al. draft 2000). Land owner: U.	SBD
11	0 in 1979	1979	Fawnskin Meadow, Bear Valley, San Bernardino Mtns. Possibly extirpated. PVT inundated by Grout Bay or developed.	SBD

12	< 100 in 1981 on 2 acres	1983	W end of Baldwin Lake, E of Big Bear City, Bear Valley. Near Pan Hot Springs. Two colonies. w/ <i>Poa atropurpurea</i> , <i>Thelypodium stenopetalum</i> , <i>Packera bernardina</i> , <i>Taraxacum californicum</i> . City of Big Bear has had extensive grazing. Also threatened by flood control development in 1983. Site quality is excellent (Krantz, et. al. draft 2000).	SBD
13	< 10 in 0.25 acres in 1979; 4 in 1978	1979	Meadow near entrance to Big Bear City Airport (Kiener Dr. & Fairway Blvd.) In meadow on sandy loam soil w/ <i>Pyrrcoma uniflora</i> ssp. <i>gossypina</i> , <i>Artemisia tridentata</i> , <i>Sisymbrium altissimum</i> , <i>Hordeum californicum</i> . Nearly extirpated. PVT disturbed by grading near fence, herbicide spraying (1980), and airplane hanger development.	SBD
17	606 in 1988	1988	S of Metcalf Bay, from Presbyterian Conference grounds to Big Bear Blvd. Along annual creek and meadows surrounded by Jeffrey pine forest. Dominants include <i>Artemisia arbuscula</i> , <i>Ranunculus californicus</i> , <i>Viola douglasii</i> , <i>Achillea</i> sp. Other rare plants incl. <i>Castilleja lasiorhyncha</i> , <i>Castilleja cinerea</i> . PVT largely extirpated in 1982- not being harmed further in 1983 (Eliason pers.comm.). In 1987, part of occ. was impacted by dredging. TNC monitored occurrence in 1988.	SBD

20	100+ in 1986; 50 in 1987	1987	Old Ski Beach at Kidd Cove, SW end of Big Bear Lake, San Bernardino Mtns. Previously threatened by water skiing, also heavily trampled. In a remnant meadow and in the midst of SBNF special use cabins. w/ <i>Castilleja lasiorhyncha</i> . Area fenced in 1986, but fence goes through middle of the remaining habitat. SBNF.	SBD
*	1	2001	Coldbrook Campground. Meadow w/ <i>Achillea millefolium</i> , <i>Elymus trachcaulus</i> ssp. <i>trachycaulus</i> , <i>Monardella linoides</i> , <i>Dodecatheon hendersonii</i> , <i>Rosa woodsii</i> . Campground is closed, but dispersed recreation, snowplay, and nearby equestrian and mountain bike use are potential threats. Only a single plant exists. SBNF.	SBD
658274 (RSA)	U	2000	San Bernardino Mts. Big Bear Lake: South shore of the lake at Metcalf Bay, between Prairie Lane and Metcalf View Drive, open grassland and wet meadow between Hwy 18 and the lake shore. T2N/R1W/S24. (White/RSA)	SBD
UCR48002 (SMASCH)	U	1987	San Bernardino Mts., Foxfarm Rd. near Big Bear Lake, clay meadow with <i>Poa</i> spp., <i>Artemisia tridentata</i> , <i>Elymus triticoides</i>	SBD

*	2	1999	Belleville Meadow. 2 plants observed in 1999 were extant from transplanted material in the 1980's.	SBD
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- *U = Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *TNC = The Nature Conservancy*
- *CDFG = California Department of Fish and Game*
- *SBD = San Bernardino County*

Threats

Historically, *Sidalcea pedata* was probably much more abundant before the construction of Big Bear Dam in the late 1800's. The creation of Big Bear Lake resulted in loss of a major mountain meadow system (U.S. Fish and Wildlife Service 1998).

Threats to *Sidalcea pedata* include any actions that could change the hydrological regime or result in soil compaction, or the introduction of invasive nonnative plant species. *Tamarix ramosissima* present in Baldwin Lake could affect two occurrences on NFS lands. Habitat loss and fragmentation may also affect the pollinator fauna (USDA Forest Service 2002). Most *Sidalcea pedata* occurrences are on private land, where the primary threat is habitat loss from development. Increased urban development will continue to add to the pressures on the few remaining areas of private lands that support known occurrences as well as areas with potential habitat.

On NFS lands, lake shore erosion at Ski Beach (occ. no. 20) may cause long-term degradation when lake levels are low however, engineering solutions would probably be available to remedy the threat if it arises (USDA Forest Service 2002). Roadside littering, and invasive nonnative plants affect the Baldwin Lake occurrence on the northwest shore and there is a possibility that boating access may affect this occurrence, however this has not been documented (USDA Forest Service 2002). Impacts from motorcycle, mountain bike, and equestrian use off designated trails originating from private land continue to impact plants at South Baldwin Lake (occ. no. 8. There are user created trails within Lodgepole Meadow but no effects to the occurrence have been noted.

Conservation and Management Considerations

The North Baldwin Lake occurrence (occ. no. 1), managed by the California Department of Fish and Game, is the only occurrence currently receiving full protection. Five other sites receive partial protection (Bluff Lake, Ski Beach, Eagle Point, Pan Hot Springs, and Metcalf Bay). The remaining occurrences were described by U.S. Fish and Wildlife Service (1998) as unprotected, degraded, or

threatened (U.S. Fish and Wildlife Service 1998). In 1999, the San Bernardino National Forest completed habitat improvement projects within most of the known locations on NFS lands. The Ski Beach occurrence was removed from boating maps, the porta-potty removed and the area fenced to exclude dispersed use. The south Baldwin Lake site was protected by fencing and signing along adjacent private lands (USDA Forest Service 2002). Fencing also protects the two transplanted plants within Belleville Meadow. New fencing in Belleville Meadow contain visitor use within the uplands and user created trails have been allowed to recover naturally. In 1999, a full time resource patrol officer was hired to monitor occurrences, maintain fence lines and signing in a timely manner and increase public environmental awareness. Forest Service personnel have been made aware of the individual plant located in Coldbrook Campground and the campground is in non-use status.

The following list of conservation practices should be considered for *Sidalcea pedata*:

- Continue implementation of the recovery plan for *Sidalcea pedata*.
- Implementation actions in the SBNF Meadow Habitat Management Guide to the greatest extent practicable.
- Investigate potential effects from boating access to the northwest shore occurrence on Baldwin Lake.
- Apply the habitat suitability criteria and detection protocol developed for this taxon to surveys at the project level.
- Survey all new occurrences of *Sidalcea pedata* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Sidalcea pedata* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Sidalcea pedata* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Sidalcea pedata is considered to have high vulnerability on National Forest System lands (Stephenson and Calcarone 1999) because it 1) is endemic to the Big Bear Valley area, 2) is restricted to montane meadows, a rare habitat type, 3) is present within a high use recreation area, 4) is affected by user created trail use and 5) is affected by changes in hydrological regimes. Fencing and signing of the Ski Beach occurrence in 1999 has been successful in protecting habitat from trampling and use of an unclassified trail. The installation of fencing and interpretive signing and the restoration of an unclassified trail in 2001 have succeeded in providing additional protection to the Belleville Meadow occurrence. An attempt has been made to reduce unclassified trail use off the private property on to NFS lands at the South Baldwin Lake occurrence in 2002 by installing signing. Monitoring of all protection measures occurs at high frequency and repairs are completed in timely manner. Implementation of strategies listed in the Meadow Habitat Management Guide completed on the San Bernardino National Forest in 2002 will provide continual protection for this species (USDA Forest Service 2002).

The Ski Beach occurrence and the South Baldwin Lake occurrences on NFS lands have a large number of individual plants and the trend for this species appears to be increasing on NFS lands (Stephenson and Calcarone 1999). Habitat degradation caused by user created trails and changes to hydrological regimes appear to be the largest threats at this time. The USDA Forest Service has identified activities that alter the hydrological function of meadow habitat for *Sidalcea pedata* (USDA Forest Service 2000). Specific activities include forest roads and trails, and dispersed recreation.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	C	A

Sidalcea pedata is listed under the Endangered Species Act of 1973, as amended, as endangered, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

The viability of this species is primarily tied to protection and management of meadow habitat. To provide for viability and recovery of this species, some of the most important habitat for this species must be clearly and substantially protected. With implementation of the USFWS Recovery Plan and the SBNF Meadow Habitat Management Guide, viability for this species on NFS lands is secure.

Under Alternative 1, current management would be retained and actions completed for the Southern California Conservation Strategy are expected to be retained under all alternatives. Under Alternatives 1-5, several populations would continue to be managed under Back Country zoning. The Ski Beach occurrence would be zoned Developed Area Interface under all alternatives, however because habitat for this taxon occurs in wet meadows, no Wildland Urban Interface zone fuel treatments are expected. Under Alternatives 4a and 6, the Lodgepole Meadow occurrence would be managed within a Back Country Non-Motorized zone. Under alternatives 2, 3, 4, 4a and 6, three of the nine acres of occupied habitat on NFS lands would be managed within a Critical Biological land use zone at the South Baldwin Lake occurrence. In all alternatives, four of the occurrences (six acres of the nine total NFS land) acres would be managed within the existing North Baldwin Holcomb Valley Special Interest Area managed for the botanical and zoological resource values for which it was established. Under Alternatives 2-6,

occurrences within this established SIA would receive additional protection as new projects are proposed from the use of Standard S33. Alternatives 1, 2, 3,4a and 6 prioritize invasive nonnative species in threatened and endangered species and riparian habitat. These alternatives would benefit occurrences where *Tamarix rasissimos* is present.

Consideration of the suitable use restricting motorized and mechanized vehicle travel to designated forest transportation system roads and trails, along with Standards associated with Special Interest Areas, dispersed recreation, special uses that relate to water extraction, and riparian areas factor in to the outcomes as do emphasis of the alternatives. Implementation of actions listed in the Recovery Plan and in the SBNF Meadow Habitat Management Guide also factor in to this outcome as do the emphasis of the alternatives as described below.

In Alternative 2, there is a higher level of investment in avoidance and minimization of effects to species-at-risk but provides little focus on the restoration of habitats. More intensive user controls would be designed to minimize user conflicts with sensitive environmental resources. Under alternative 3, there is a higher level of investment in proactive habitat improvement and surveys, and a stronger focus on habitat restoration compared to avoidance of habitat degradation. There is a higher level of investment in maximum visitor capacity controls and modification of existing facilities including a decommissioning of recreation facilities and individual sites that are affecting sensitive resources. Alternative 4 would provide the most emphasis on all types of recreation. In this alternative, there is a higher level of focus on management of recreation growth including monitoring recreation use and its effects and managing use in order to offset effects of uses on other resources such as wildlife and vegetation, emphasizing enforcement, and public education programs.

The difference between Alternative 4 and Alternative 4a is that 4a would not accommodate as much developed recreation and would focus more on mangement of the setting and dispersed area management. There is also is additional Back Country Non-Motorized zoning in 4a. Alternative 5 is designed to fully accommodate the projected demand for motorized recreation use, which may increase incidents of unauthorized off-route vehicle travel increasing the risk that portions of the populations could be damaged. In Alternative 6, there is a higher level of emphasis on Alternative 6 in low impact recreation, visitor capacity controls, public education and habitat restoration. Recovery of this species is expected to occur sooner under Alternatives 3 and 6 due to the emphasis on protecting ecological integrity.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

Sidalcea pedata is a locally endemic species restricted to meadow habitat in Big Bear and Holcomb Valley and occurrences are few. It is listed as endangered by the state of California offering some protection on private land, however the trend for this species on private land is declining (Stephenson and Calcarone 1999). Although two occurrences are protected within reserves, occurrences on private land are affected by development, grazing, grading and accidents that occur. As private land development increases, the demand for water and new diversions/extractions increases. This in turn increases the potential for changes in hydrological regimes that could affect wet meadow habitat. Maintenance of occurrences and habitat improvement on NFS lands may promote recovery of this taxon across NFS lands; however these actions will not prevent loss of occurrences on private lands.

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**Sidalcea hickmanii ssp.
parishii**

Sidothea caryphylloides

Sidotheca caryophylloides

Sidotheca caryophylloides (Parry) Reveal (Chickweed starry puncturebract)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Sidotheca caryophylloides is endemic to the southern high Sierra Nevada, Transverse Ranges, and San Jacinto Mountains (Hickman 1993).

Distribution in the Planning Area

Sidotheca caryophylloides has been collected from Pine Mountain, Reyes Ridge, and Reyes Peak on the Los Padres National Forest and the vicinity of Mount Baldy in the San Gabriel Mountains on the Angeles National Forest (CalFlora 2002).

In the San Bernardino Mountains occurrence locations include include Strawberry Peak, Lake Arrowhead, Running Springs, Deep Creek, Keller Peak, Deer Lick, Big Bear Lake, and Big Bear Valley (Krantz, et. al. draft 2000) on the San Bernardino National Forest. In the San Jacinto Mountains, it has been collected from the James Reserve on a four year old burn, near Mountain Center, and from Fuller's Mill (White draft 2002).

Taxonomy and Natural History

See Reveal (2005) and Jepson Flora Project (2005) for information regarding the name change from *Oxytheca caryophylloides* to *Sidotheca caryophylloides*.

Sidotheca caryophylloides is a dicotyledon in the buckwheat family (Polygonaceae). This annual herb

blooms July–September (California Native Plant Society 2001).

Sidotheca caryophylloides is a 10-25 cm plant. The leaves are 1-8 cm, generally oblanceolate, strigose, and glandular. The inflorescence is sparsely glandular at the nodes. The involucre is funnel-shaped and glabrous or glandular. The five involucral bracts are 4-7 mm, fused only at the base, and the awns are 0.3-1 mm. There are 2-3 flowers per involucre. The perianth is 1-2 mm, greenish white to reddish, and each lobe has three more or less regular lobes at the tip. Fruit are 1.2-1.5 mm (Hickman 1993).

Habitat Description

Sidotheca caryophylloides grows on sandy soils in montane conifer forests at elevations of 3,900–8,500 feet (1,200–2,600 meters) (California Native Plant Society 2001). This species mostly occurs in yellow pine forest (Munz 1974).

Occurrence Status

Sidotheca caryophylloides population trends on National Forest System lands are unknown; however, because this species is an annual, high annual variability is expected. The reported occurrence at Strawberry burned in the 2003 Old Fire. Status of this occurrence post-fire is unknown.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Sidotheca caryophylloides* (Chickweed starry punturebract)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
1429502	U	U	South slope of the San Bernardino Mountains. Land owner: U.	SBD
1821324	U	1929	Metcalf Bay, Big Bear Lake. San Bernardino Mountains. Land owner: U.	SBD
1821323	U	1927	Big Bear Lake. Land owner: U.	SBD
1222232	U	1891	Bear Valley dam, San Bernardino Mtns. SBNF	SBD

*	U	2000	Kellar Peak. Near Shady Cove Group Campground. Drainage. SBNF-Children's Forest.	SBD
*	U	U	Strawberry Peak, San Bernardino Mountains. Priv.	SBD
*	U	U	Lake Arrowhead. Ownership U.	SBD
*	U	U	Running Springs. Ownership U.	SBD
*	U	U	Deep Creek. Ownership U	SBD
*	U	U	Deer Lick. Ownership U	SBD
1198150	U	1963	Reyes Peak, ca. ¾ mi. W of Pine Mt. LPNF.	VEN
1823761	U	1965	Reyes Ridge Rd. W of trail to peak. LPNF or immediately adjacent.	VEN
1824826, 1824827	U	1965, 1956	Road on Pine Mt. W of Reyes Peak, off Hwy 399. LPNF or immediately adjacent.	VEN
1821767	U	1965	Below Reyes Peak near jct. trail to Peak and Reyes Peak Rd. LPNF.	VEN
1824825	U	1992	Pine Mt. Ridge, ca. 2 mi. E of Reyes Peak. LPNF.	VEN
1818100	U	1965	On south side at west foot of Reyes Peak. LPNF.	VEN
1824828	U	1956	End of road below S side of Reyes Peak on Pine Mt. Rd. LPNF or immediately adjacent.	VEN

- *U* = *Unknown*
- * = *an occurrence number has not been assigned*
- *SBNF* = *San Bernardino National Forest*
- *LPNF* = *Los Padres National Forest*
- *SBD* = *San Bernardino County*
- *VEN* = *Ventura County*

Threats

Sidotheca caryophylloides has a sparse known distribution and exhibits high annual variability; as a result, this species may be vulnerable to stochastic events resulting in occurrence extirpation. Most of the collections of this species are historical (records are more than 30 years old), and field validation of old locality information within each forest is needed (USDA Forest Service 2003).

The primary threat to this species habitat is fuels and vegetation management that will occur across most of this species habitat during the Plan period. Most of this work is driven by the need for "Forest Health" treatments of areas with high tree mortality. Such vegetation management may have short-term adverse affects with the possibility of longer-term beneficial affects tied to the more open vegetation structure and availability of open sandy soils. In addition, such impacts would be addressed at the project level.

The only other substantial threat to this species is vehicle travel off of designated system roads.

Conservation and Management Considerations

The conservation strategy for this species is to improve the knowledge of its distribution and ecological responses to fire and forest thinning projects. The following is a list of conservation practices that should be considered for *Sidotheca caryophylloides*:

- Survey all new occurrences of *Sidotheca caryophylloides* and any occurrences that have not been visited in the past ten years and record occurrence status, habitat condition, and threats.
- Monitor known and newly found occurrences following fire and Forest Health projects to document response.
- Collect a herbarium voucher specimen of *Sidotheca caryophylloides* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Sidotheca caryophylloides* in the planning area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Sidotheca caryophylloides is uncommon on sandy soils within montane coniferous forests of the

southern Sierra, Peninsular Ranges, and San Jacinto Mountains. This species is uncommon throughout its range, but in good rainfall years occurrences can consist of many thousands of individuals. Most of the recorded occurrences are vulnerable to identified threats, however this species is expected to tolerate moderate levels of disturbance and may benefit from some level of impact in the long-term.

Based on this analysis, *Sidotheca caryophylloides* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Sidotheca caryophylloides is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Sidotheca caryophylloides* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Sidotheca caryophylloides* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Sidotheca caryophylloides* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Sidalcea pedata

Sidotheca emarginata

Sidotheca emarginata

Sidotheca emarginata H.M. Hall (White-margined starry puncturebract)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2; S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Sidotheca emarginata is endemic to the San Jacinto and Santa Rosa Mountains of Riverside County, California (Hickman 1993).

Distribution in the Planning Area

Sidotheca emarginata occurs on the San Bernardino National Forest. Most occurrences are found in and around the Garner Valley, an area with two active grazing allotments (USDA Forest Service 2002). This species is reported from historic collections on the northwest slope of the Santa Rosa Mountains and from the Pines to Palms Trail, Pipe Creek, Hidden Lake area in the San Jacinto State Park and Tahquitz Peak in the San Jacinto Mountains (CalFlora 2002). More recent collections are known from Garner Valley Ranch, Pinyon flats, and Spitler Peak Trail (White draft 2002).

Taxonomy and Natural History

See Reveal (2005) and Jepson Flora Project (2005) for information regarding the name change from *Oxytheca emarginata* to *Sidotheca emarginata*.

Sidotheca emarginata is a dicotyledon in the buckwheat family (Polygonaceae). It is distinguished from similar members in the genus by floral characters (Hickman 1993). This annual herb blooms from February – August (California Native Plant Society 2001).

Sidotheca emarginata is 3-30 cm. The leaves are 1.5-7.5 cm, generally oblanceolate, sparsely strigose, and glandular. The inflorescence is sparsely glandular. The bracts are linear to ovate. The involucre is very widely funnel-shaped, laterally flattened, glabrous, and white-margined. There are 5 involucral bracts, which are 4-8 mm, more than half-fused, and with 1-1.5 mm awns. There are 3-6 flowers per involucre. The perianth is 2-5 mm, white to pink, with irregularly fringed lobes. The fruit are 1.8-2 mm (Hickman 1993).

Habitat Description

Sidotheca emarginata occurs at elevations of 3,900–8,200 feet (1,190–2,500 meters) on gravelly soils in openings within chaparral, lower montane coniferous forest, and pinyon-juniper woodlands (California Native Plant Society 2001). In at least one occurrence, *Sidotheca emarginata* is found with *Penstemon californicus*, a San Bernardino National Forest sensitive species (USDA Forest Service 1995).

Occurrence Status

Population trends and vulnerability on National Forest System lands are unknown.

The table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Sidotheca emarginata* (White-margined starry puncturebract)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1978	Santa Rosa Mts., Pinyon flats area near the dolomite mine, T07S/R05E/S11	RIV
2	U	1980	Santa Rosa Mts., 4.5 mi. S of Hwy 74 along Santa Rosa Mt. Rd. (USFS Rd. 7S02), T07S/R05E/S20	RIV
3	U	1937	Santa Rosa Mts., Vandeventer Flat, T07S/R04E, elev. 4650 ft.	RIV
5	U	1964	San Jacinto Mts. 2 mi. NE of Kenworthy Ranger Station, T06S/R04E/S19	RIV

6	U	1972	Garner Valley Ranch: T6S/R3E/S11, Dry bench above E. edge of meadow	RIV
1417576	U	1937	NW slope of Santa Rosa Mountains. Land owner: U	RIV
1381032	U	1922	Pines to Palms Trail, E slope of San Jacinto Mountains. Land owner: U. elev.5000 ft.	RIV
1365786	U	1922	Pipe Creek, San Jacinto Mountains. Hemet Valley. SBNF.	RIV
1429624	U	1901	Rocky ridges near Tahquitz. San Jacinto Mountains. SBNF-San Jacinto Wilderness.	RIV
596530 (RSA)	U	1960	Santa Rosa Mts., Garnet Queen Mine (Wheeler/RSA)	RIV
*	50+	1995	Quinn Flat. Open chaparral. Gravelly soil at base of slope near meadow. w/ <i>Penstemon californicus</i> . SBNF.	RIV
*	100's	2003	Desert View Trail between Hidden Lake and overlook in Mt. San Jacinto State Park. Plants occur in trail and are affected by trail use. Trail has been disguised, however some use is occurring. May 03 Eliason	RIV
593784 (RSA)	U	1995	San Jacinto Mts., Garner Valley, Idyllwild 7.5' USGS quad. T6S/R3E/SW ¼ S24 (Hirshberg/RSA)	RIV

544399 (RSA)	U	1991	San Jacinto Mts. Region, Pinyon Flats area near Ribbonwood, White calcareous outcrop forming small hill N of Hwy 74. (Boyd/RSA)	RIV
287109 (RSA)	U	1981	San Jacinto Mts. Region, burned area on E side of Mt. San Jacinto (USFS T4.5S/R3.5E) elev. 6000 ft. (Lyman/RSA)	RIV
64889 (RSA)	U	1922	San Jacinto Mts. Region, along the low hill slopes on E. side of Hemet Valley, ca. 1 mi. W of Kenworthy. Elev. 4500 ft. (Peirson/RSA)	RIV
64888 (RSA)	U	1937	San Jacinto Mts. Region, Santa Rosa Indian Reservation; elev. 4000 ft. (Woglum/RSA)	RIV
553952 (RSA)	U	1991	San Jacinto Mts. Region, SE end of Garner Valley, on Pacific Crest Trail, 2-3mi. N of jct. With Hwy 74; in vicinity of Bull Cyn. (Ballmer/RSA)	RIV
44206 (UCR)	U	1986	San Jacinto Mts., trail to Spitler Peak from Hurkey Creek Camp to Bonita Vista Rd. T5S/R3E/S35 (Sanders/UCR)	RIV
132913 (UCR)	U	1998	San Jacinto Mts., Pine Meadow in eastern Garner Valley, R-Ranch, just E. of Hwy 74, between Gold Hill and Thomas Mt., T7S/R4E (Wear/UCR)	RIV
146126 (UCR)	U	2003	San Jacinto mts., NE of South Ridge trailhead, E. of Idyllwild, T5S/R3E/S17 (Denslow/UCR)	RIV

- *U = Unknown*
- ** = An occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *RIV = Riverside County*

Threats

Sidotheca emarginata is vulnerable to overgrazing, trampling, development projects, and recreational activities (Stephenson and Calcarone 1999). This taxon has the potential to be impacted by chipping or placement of organic material following fuels treatments. Project design could avoid or minimize this impact (Eliason pers. com). More information is needed to determine the actual effects to this species on National Forest System lands.

Conservation and Management Considerations

The following list of conservation practices should be considered for *Sidotheca emarginata*:

- Survey all new occurrences of *Sidotheca emarginata* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Sidotheca emarginata* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Sidotheca emarginata* in the planning area using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Sidotheca emarginata is endemic to the San Jacinto and Santa Rosa Mountains of Riverside County, California (Hickman 1993). Few of these occurrences have been recorded recently, so the true threat to this species is not currently known. Based on what is known about this species distribution and habitat associations, and the potential for fuels treatments within habitat, and the threat inherent in poor knowledge *Sidotheca emarginata* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	B	A

Sidotheca emarginata is a USDA, Region 5 Forest Service Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

The recent NFS land acquisitions in the Garner Valley area, use of Forestwide standards, especially S35 that allows motorized and mechanized use on National Forest System roads and designated trails only were taken into consideration when determining these outcomes.

Under all alternatives, the Tahquitz occurrence would retain management within the existing San Jacinto Wilderness. Under Alternative 1, open-structure habitats in general; and *Sidotheca emarginata* in particular, would continue to be at risk from unauthorized vehicle travel off Forest Transportation System roads and trails. The Quinn Flat occurrence location would remain zoned as Developed Area Interface, and the Pipe Canyon occurrence location would remain zoned as Back Country.

Under Alternatives 2, 4, 4a and 5, Quinn Flat and Pipe Canyon locations would be zoned Back Country. Under Alternative 3, the Quinn Flat occurrence location would be designated as the Pyramid Peak B wilderness and the Garner Valley Special Interest Area. The Pipe Canyon occurrence location would retain Back Country zoning. Under Alternative 6, the Quinn Flat and the Pipe Canyon occurrence locations would become zoned as Back Country Non-Motorized and the Quinn Flat occurrence would be within the recommended Garner Valley Special Interest Area. The emphasis on protecting and enhancing biodiversity under alternatives 3 and 6 could improve the status of this species by relocating the occurrences, defining threats and protecting occurrences and habitat as necessary.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	B	A

Although ownership records of some of the historic locations are not specific enough to identify the land ownership, it is highly likely due to the current land status, that the majority of the known occurrences occur on NFS lands. Management of this species may be directly tied to NFS land management and that of San Jacinto State Park. Based on this assessment, and by maintaining the current distribution of

Sidotheca emarginata on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause *Sidotheca emarginata* to suffer a decline in its overall distribution.

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Sidothea caryphylloides

**Streptanthus albidus ssp.
peramoenus**

Streptanthus albidus ssp. peramoenus

Streptanthus albidus Greene ssp. *peramoenus* (Greene) Kruckeberg (Most beautiful jewelflower)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G2T2, S2.2 – threatened (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 1B; R-E-D Code 2-2-3

General Distribution

Streptanthus albidus ssp. *peramoenus* has been reported from Alameda, Contra Costa, Monterey, Santa Clara, and San Luis Obispo counties (CalFlora 2002, California Native Plant Society 2001, California Natural Diversity Database 2002). It is also found near the summit of Pico Blanco (Norman 2003).

Distribution in the Planning Area

Streptanthus albidus ssp. *peramoenus* occurs on the Monterey Ranger District, Los Padres National Forest at Salmon Creek just above Highway 1 (CalFlora 2002), on South Coast Ridge Road (Painter & Neese s.n. (SBBG)), and also occurs on National Forest System land in the San Carpoforo watershed (Hardham 12026 (SBBG)) and Lion Mountain areas (Hardham 18501 (SBBG)). It is also found in the area around the city of San Luis Obispo (California Natural Diversity Database 2002), and from several collections from California Polytechnic State University in San Luis Obispo (Painter 2004), suggesting that there is potential for *Streptanthus albidus* ssp. *peramoenus* to occur on the northern portion of the Santa Lucia Ranger District, Los Padres National Forest. It is also known from Fort Hunter Liggett (Painter 2004).

Taxonomy and Natural History

Streptanthus albidus ssp. *peramoenus* is a dicot in the mustard family (Brassicaceae) (Buck et al. 1993). It is a member of the *Streptanthus glandulosus* complex, a group of morphologically similar species that share a preference for ultramafic substrates (Kruckeberg 1957). The taxa in this complex are differentiated primarily by flower color, but floral color variation is a common feature within the

Streptanthus glandulosus complex and other *Streptanthus* species (Preston 1994). The taxonomic identity of the populations in Monterey and San Luis Obispo Counties is in question (California Native Plant Society 2001); these appear to represent disjunct populations of *Streptanthus glandulosus*, rather than *Streptanthus albidus* ssp. *peramoenus* (Mayer et al. 1994).

Streptanthus albidus ssp. *peramoenus* is an annual herb that flowers April–June (California Native Plant Society 2001).

Habitat Description

Streptanthus albidus ssp. *peramoenus* grows in chaparral, cismontane woodland, and valley and foothill grassland on serpentinite substrates. The elevation range for *Streptanthus albidus* ssp. *peramoenus* is 400–3,280 feet (120–1,000 meters) (California Native Plant Society 2001).

Occurrence Status

Streptanthus albidus ssp. *peramoenus* is found in a limited number of occurrences and is considered to be in danger of extirpation in a portion of its range (California Native Plant Society 2001). There is no information available regarding the status of occurrences found on National Forest System lands.

Threats

Streptanthus albidus ssp. *peramoenus* is at risk from loss of habitat to urban development and from grazing impacts (California Native Plant Society 2001). No site-specific threats have been identified for occurrences found on National Forest System lands. *Streptanthus albidus* ssp. *peramoenus* was only recently added to the Los Padres National Forest Watch List (2003) and only since that time has the Forest begun to track this species.

Threats and possible threats at Camp San Luis Obispo include cattle, non-native plants, military training activities, feral pigs, too frequent fires, fires in wrong season, trampling, and dust (Painter 2004).

Conservation and Management Considerations

More information is needed to determine the exact taxonomic status of the plants found on Fort Hunter Liggett and in San Luis Obispo County. If these plants are determined to be *Streptanthus albidus* ssp. *peramoenus*, then the potential for this taxon to occur elsewhere on the Los Padres National Forest will need to be reassessed.

Evaluation of Current Situation and Threats on National Forest System Lands

Streptanthus albidus ssp. *peramoenus* is uncommon, found only at two, or possible three locations on the Los Padres National Forest, and no threats have been reported for these locations. The occurrence

reported from the San Carpoforo watershed is located in the Silver Peak Wilderness. Under all alternatives, the occurrence found above Highway 1 in the Salmon Creek watershed is in area that would be the Back Country land use zone. Low intensity grazing is the only land use that would affect plants in this area and a recent analysis of the livestock use on Salmon Creek Allotment determined that this low level of grazing use is not expected to have any effect on the local distribution and abundance of *Streptanthus albidus* ssp. *peramoenus* (Foster 2003).

Based upon the above analysis *Streptanthus albidus* ssp. *peramoenus* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Streptanthus albidus* ssp. *peramoenus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Streptanthus albidus* ssp. *peramoenus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Sidotheca emarginata

Streptanthus bernardinus

Streptanthus bernardinus

Streptanthus bernardinus (E. Greene) Parish (Laguna Mountains jewel-flower)

Management Status

Federal: Cleveland National Forest Sensitive List, San Bernardino National Forest Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Streptanthus bernardinus occurs in the eastern Transverse Range and Peninsular Range in California. Its range may extend to Baja California (Buck, Taylor & Knuckeberg 1993), but this has not been verified (Reiser 1994).

Distribution in the Planning Area

Streptanthus bernardinus is known from around twenty-four occurrences on the San Bernardino National Forest, although this number may be arbitrary as occurrences appear to overlap and some are spread over wide areas. In the San Bernardino Mountains, this species occurs near Green Valley Lake, Little Green Valley, Crab Flats, Snow Valley, Running Springs, Cleghorn Ridge, the Lake Arrowhead area, and north and east of Fawnskin. This species appears to be most abundant in the Green Valley-Crab Flats area. Recently, a population was also documented below the Big Bear dam, just outside of the CalTrans Bridge replacement project area. *Streptanthus bernardinus* also occurs at San Sevaine and the head of the south fork of Lytle Creek in the San Gabriel Mountains. In Riverside County, this species is found in the Millard Canyon RNA at the south end of the San Bernardino Mtns., in the San Jacinto Mountains near Dark Canyon Campground, and in areas within Mt. San Jacinto State Park. There is one occurrence at Hall Canyon that extends from the UC Riverside James Preserve to the SBNF in the Hall Canyon RNA. *Streptanthus bernardinus* also occurs in a few areas of the Laguna Mountains in the Descanso Ranger District of the Cleveland National Forest (USDA Forest Service 2003).

Taxonomy and Natural History

Streptanthus bernardinus is a dicotyledon in the mustard family (Brassicaceae). This perennial flowers from June-July (Munz 1974). *Streptanthus bernardinus* is a simple to few-branched 3-6 dm tall perennial from a woody root crown. The basal leaves are 3-8 cm, 10-25 mm wide, oblanceolate, generally dentate above the middle, and rarely ciliate on the petioles. Cauline leaves are more or less lanceolate and acuminate, often with purple margins. The calyx is biradial; the sepals are 5-9 mm, light green in bud to becoming light yellow to white in flower. The sepals are widely oblong with scarious margins. There are 0-few bristles at the tip of the sepals. The petals are 7-11 mm, white, and slightly exerted. The filaments are free and the anthers are equal. The stigma is barely 2-lobed. Fruit are ascending or spreading, 5-8 cm, 1.5-2 mm wide, and generally straight. The seeds are oblong and winged (Buck, Taylor & Knuckeberg 1993).

Habitat Description

Streptanthus bernardinus inhabits lower montane coniferous forest between 1200-2500 m. It may occupy mesic areas such as streambanks or drier openings within the forest understory on granitic gravel or sand. *Streptanthus bernardinus* grows in open areas, including road cuts, skid trails, and natural forest openings with low litter accumulation. This species appears to tolerate somewhat disturbed areas, colonizing disturbed areas after the disturbance element has been removed. Associated species include *Pinus jeffreyi*, *P. ponderosa*, *Quercus kelloggii*, *Calocedrus decurrens*, and *Erysimum capitatum* (California Natural Diversity Database 1997; USDA Forest Service 2003) At San Sevine in the San Gabriel Mountains, *Streptanthus bernardinus* occurs in chaparral where it is associated with *Eriodictyon trichocalyx*, *Eriogonum fasciculatum*, *Ceanothus leucodermis*, *Rhamnus californica*, *Quercus chrysolepis*, and *Q. kelloggii* (USDA Forest Service 2003). One location on the Cleveland National Forest grows in association with *Calocedrus decurrens*.

Occurrence Status

Some occurrences are protected within Research Natural Areas (Millard Canyon RNA, Hall Canyon RNA, and the Fisherman's Camp RNA) on the San Bernardino National Forest and at the UC Riverside James Reserve. There are also occurrences at Cuyamaca Rancho State Park adjacent to the Cleveland National Forest.

The following table shows the recorded occurrences in/near the planning area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Streptanthus bernardinus* (Laguna Mountains jewel-flower)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	U	1983	NW side of Middle Peak. Mixed conifer forest w/ <i>Abies concolor</i> , <i>Calocedrus decurrens</i> , <i>Quercus kelloggii</i> . Also w/ <i>Monardella macrantha</i> ssp. <i>hallii</i> , <i>Psoralea rigida</i> , <i>Thermopsis macrophylla</i> var. <i>semota</i> . DPR-Cuyamaca Rancho State Park.	SD
2	U	1983	Cherry Flat. In low, open chaparral. Area is rocky and windswept. Associated w/ <i>Haplopappus parishii</i> , <i>Pteridium aquilinum</i> , <i>Erysimum capitatum</i> , <i>Calystegia fulcrata</i> . Large population. Area was burned by Conejo Fire in 1950 and Boulder Creek Fire in 1970. DPR-Cuyamaca Rancho State Park.	SD
3	< 10	1982	Hall Canyon. On N-facing slope in granitic gravel and sand. Associated w/ mixed conifer forest. w/ <i>Abies concolor</i> , <i>Calocedrus decurrens</i> , <i>Pinus jeffreyi</i> , <i>Quercus kelloggii</i> . UC Riverside James Reserve/SBNF-Hall Canyon RNA.	RIV
4	U	1980	San Jacinto Mtns., near small stream, ¼ mi. S of Dark Canyon Campground along Road 4S02. On dry bank above road under pines. In yellow pine forest with oaks. SBNF.	RIV

5	U	1982	Deer Lick Station, Running Springs, San Bernardino Mountains. SBNF/PVT?	SBD
6	U	1976	Green Valley Road, 1.4 mi. from JCT w/ HWY 18, San Bernardino Mtns. Along moist streamside and on shady W-facing slope (facing the stream) in Jeffrey pine forest. PVT in SBNF.	SBD
7	U	1974	Keller Peak Road, San Bernardino Mtns. SBNF.	SBD
11	U	1963	Green Valley Lake area, San Bernardino Mtns. Around 6,000'. SBNF.	SBD
12	150	1987	ca. 1.5 mi. NE of Running Springs and N of Green Valley Lake Rd., San Bernardino Mountains. In weathered granite soils in yellow pine forest dominated by <i>Pinus ponderosa</i> , <i>P. jeffreyi</i> . Also associated w/ <i>Erysimum capitatum</i> , <i>Eriophyllum lanatum</i> var. <i>obovatum</i> . 150 plants total in several subpopulations on private land. Camp development is a threat. Seven plants found on SBNF adjacent to camp. PVT/SBNF.	SBD
1819733 (CalFlora)	U	1927	Big Bear Lake. Land owner: U.	SBD

1249653 (CalFlora)	U	1953	At junction of Crest Forest Dr. and Great View Dr. 3 mi. N of Crestline, W end of mountains. Land owner: U.	SBD
802516 (CalFlora)	U	1989	Along Green Valley Lake Rd., 1.1 mi. N of Hwy 18. State of CA. Note that this location as described is in all likelihood on SBNF rather than state lands. SBNF?	SBD
1464246 (CalFlora)	U	1931	Arrowhead Lake. Hillside.	SBD
1820282 (CalFlora)	U	1963	ca. 0.5 mi. NW of Fawnskin Post Office. Owner: U	SBD
1819563 (CalFlora)	U	1963	Kuffel Canyon Road, S of Lake Arrowhead. Land owner: U.	SBD
1192198 (CalFlora)	U	1899	Bluff Lake, San Bernardino Mountains. Land owner: The Wildlands Conservancy.	SBD
1371356 (CalFlora)	U	1926	City Creek Grade. SBNF.	SBD
1820281 (CalFlora)	U	1989	W of Deep Creek and 1.75 mi. WNW of Green Valley Lake, SW of Fisherman's Camp at 5600 ft. Land owner: SBNF-Fisherman's Camp RNA.	SBD
1192199 (CalFlora)	U	1927	Pine Cove, San Jacinto Mountains. PVT.	RIV
1819734 (CalFlora)	U	1929	San Jacinto Mountain. Mt. San Jacinto State Park.	RIV

1249642 (CalFlora)	U	1954	ca. 2.7 mi. S of Julian, "Desert View". Land owner: U.	SD
1265082 (CalFlora)	U	1956	3.0 mi. S of Julian. Rocky hillside. Cuyamaca Mtns. Land owner: U.	SD
1404729 (CalFlora)	U	1899	Banner grade between Julian and Cuyamaca Mountains. Land owner: U.	SD
1192109 (CalFlora)	U	1924	Auto camp near Laguna Mtns. Laguna Lakes region. Land owner: U.	SD
1331660 (CalFlora)	U	1903	Cuyamaca Mountains. Land owner: U.	SD
*	U	U	Laguna Mountains. In a few areas. Early/inconspicuous and may be more common than previously thought. CNF-Descanso Ranger District. (USDA Forest Service 2003)	SD
*	4,000	1991	Buck Point, Head of S Fork of Lytle Creek. San Gabriel Mtns. Open mixed conifer woodland. Mostly in sun/semi-shade on steep, somewhat unstable slopes and among rocky outcrops, but also in shaded locations in deep soils with accumulated surface litter (oak duff, etc.). Associated w/ <i>Pinus lambertiana</i> , <i>Abies concolor</i> , <i>Ribes roezlii</i> , <i>Lotus crassifolius</i> , <i>Quercus kelloggii</i> , <i>Penstemon grinnellii</i> , <i>Erysimum capitatum</i> . Road into area is gated, but the gate is broken (as of 1991). No obvious disturbance. Population may be	SBD

			as high as 10,000 individuals. Fairly well represented in open understory on steep S- and E-facing slopes and on more gentle topography. SBNF.	
*	750	1917, 1991, 1993	San Sevaine. San Gabriel Mtns. Along FR 1N34D up to microwave tower. Exposed S- and E-facing slope on shallow, rocky soils in chaparral. Associated w/ <i>Eriodictyon trichocalyx</i> , <i>Eriogonum fasciculatum</i> , <i>Ceanothus leucodermis</i> , <i>Rhamnus californica</i> , <i>Quercus chrysolepis</i> , <i>Q. kelloggii</i> . Plants on road cut and on old bulldozer cut W of road. Plants extend up to the microwave tower, occurring around the tower and on the ridge heading W. No recent disturbance or threats, but grading/construction activities on the road or around the tower would impact plants. Plants appeared to be associated w/ disturbance. Most numerous in artificial openings in chaparral created by road cut, heavy machinery. SBNF.	SBD
*	30	1989	Green Valley Campground. Associated w/ <i>Abies concolor</i> , <i>Calocedrus decurrens</i> , <i>Pinus jeffreyi</i> . In previously disturbed areas in the campground or in openings along the edges of wooded areas. Some plants found on road cuts. No apparent threats at this time. SBNF.	SBD

*	> 2000	1989	<p>Green Valley Lake and Crab Flats. Along Crab Flats Rd., Green Valley Lake Rd. and on benches off of these roads. Along road cut banks, openings in forest, old skid trails, and low litter areas in mixed conifer forest (<i>Pinus jeffreyi</i>, <i>Abies concolor</i>, <i>Quercus kelloggii</i>, <i>Quercus chrysolepis</i>). Mostly weathered granite soils. Disturbance from OHVs, past timber sales, and roads, but this species occurs mostly in disturbed areas here (also occurs in undisturbed areas). SBNF.</p>	SBD
*	U	2000	Keller Peak. Near Shady Cove Group Campground. SBNF-Children's Forest.	SBD
*	2000+ in 1991	1990	Little Green Valley, around old camp buildings (buildings now removed), and along road banks of 2N19. SBNF.	SBD
*	U	1994	Switzer Park picnic area along Highway 18 in understory of <i>Quercus kelloggii</i> , <i>Pinus ponderosa</i> , <i>Calocedrus decurrens</i> . SBNF.	SBD
*	U	1989	Millard Canyon RNA on upper slopes and ridges above 6000'. SBNF-Millard Canyon RNA.	RIV
*	U	1991	Gray's Peak Trail and Hanna Flat Campground. Scattered throughout the area. SBNF.	SBD

*	U	1937	Hills near Julian. Owner: U	SD
*	U	1941	Green Valley. Owner: U	SBD
*	U	1982	Running Springs in T2N, R2W, Sec 4. PVT?	SBD
*	U	1997	N. Fork of Deep Creek on adjacent slopes in yellow pine forest from Snow Valley to Green Valley Lake Rd. and near Camp Wintaka. PVT/SBNF.	SBD
*	U	1994	Cleghorn Ridge along FS road 2N47, between 3N22 and Hwy 138, near Lake Silverwood. 4500-4700'. Fairly common on gravelly road cut. SBNF.	SBD
*	U	1994	Hooks Creek near Cedar Glen, E. of Lake Arrowhead. 5050'. Uncommon on dry slopes in yellow pine forest. Owner: U	SBD
*	U	1996	Yucaipa/Oak Glen area east of Oak Glen and west of Mile High Ranch in recently burned chamise chaparral and <i>Quercus chrysolepis</i> shrubland forest. Uncommon. 4100-4500'. PVT.	SBD
*	U	1993	N. of Fawnskin at base of Delamar Mtn. PVT.	SBD
*	U	1996	Lake Arrowhead area SE of Papoose Lake and N. of Cedar Glen. Uncommon in dry soil in ± spaces in yellow pine forest. 5140-5400'. PVT.	SBD

*	U	2003	N. Fork of Deep Creek along pipeline from Green Valley turnoff to Snow Valley recreation area. Fairly common on granitic slopes in yellow pine forest, 6300-6800'. PVT/SBNF.	SBD
*	U	1990s	Dogwood Campground. SBNF.	SBD
*	U	1990s	Crest Park area, east of Rim of the World High School and north of Hwy 18, scattered in disturbed openings in the yellow pine forest understory. SBNF.	SBD
*	U	1990s	Scattered on granitic slopes to the north of Hwy 18 across from Snow Valley Ski Area. In the understory of yellow pine/black oak forest. SBNF.	SBD
*	U	1990s	Below the Big Bear Dam. SBNF.	SBD
*	57	2004	San Bernardino Mts. E. of Cedar Glen along Fern Creek c.a. 2 km E. Emerald Bay, Lake Arrowhead, T2N/R3W/S13 (Roberts)	SBD
*	49	2004	San Bernardino Mts. E. of Cedar Glen ridge between Fern Creek and Shake Creek, c.a. 2.5 km E. Emerald Bay, Lake Arrowhead, T2N/R3W/S13 (Roberts)	SBD
*	456	2004	San Bernardino Mts. E. of Cedar Glen, Cedar Creek, c.a. 3.7 km E Emerald Bay, Lake Arrowhead T2N/R3W/S18 (Roberts)	SBD

*	40	2004	San Bernardino Mts. Shake Creek 2.9 km E. Emerald Bay, Lake Arrowhead and 1.2 km SE S. end Coulter Rd. ,T2N/R3W/S18 (Roberts)	SBD
*	U	2004	W. from Strawberry Peak to Crest Park in the E. & extends N from the Rim of the World and S of Hwy 189 (Belsher-Howe,Jim)	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*
- *RIV = Riverside County*
- *SD = San Diego*

Threats

Streptanthus bernardinus is threatened by prolonged or permanent ground disturbance. Specific threats to this species include road maintenance, ski area expansion, camp construction, vehicle use off of classified roads, trail construction, and heavy trampling. Occurrences in the Green Valley Lake area are impacted by road maintenance activities, but appear to recover over time. There are many proposed trail construction and camp construction projects proposed on the San Bernardino National Forest within known occurrence locations of *Streptanthus bernardinus* (USDA Forest Service 2003). Locations on the Cleveland National Forest are few, one occurrence occurs near recreational cabins under special use permit and has the potential to be affected by vegetation management for fuel reduction. Depending on the level of ground disturbance, this may or may not negatively affect habitat (pers. observation of this taxon).

Occurrences around Cuyamaca Peak within Cuyamaca State Park are especially at risk from heavy trampling as the vegetation around springs in this area is often trampled (Reiser 1994). On private land, *Streptanthus bernardinus* is threatened by development.

Conservation and Management Considerations

The following is a prioritized list of conservation practices that should be considered for *Streptanthus bernardinus*:

- Survey all new occurrences of *Streptanthus bernardinus* and any occurrences that have not been

- visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Streptanthus bernardinus* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
 - Map known and new occurrences of *Streptanthus bernardinus* in the planning area using National Resource Inventory System data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Streptanthus bernardinus is often found in disturbed sites such as along pipelines, road edges, along trails, adjacent to buildings, in and near developed recreation site, and in burned areas. This species appears to tolerate some level of disturbance. Several occurrences are large.

Based on the above analysis, *Streptanthus bernardinus* is currently assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Streptanthus bernardinus is a USDA, Region 5 Forest Service, Sensitive Species on the Cleveland National Forest. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Streptanthus bernardinus is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Streptanthus bernardinus* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Streptanthus bernardinus* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Streptanthus bernardinus* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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USDA Forest Service. 2003. "Records on file" at the Big Bear Ranger Station, San Bernardino National Forest.

**Streptanthus albidus ssp.
peramoenus**

Streptanthus campestris

Streptanthus campestris

Streptanthus campestris Wats. (Southern jewelflower)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G2, S2.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B R-E-D Code 2-1-2

General Distribution

Streptanthus campestris occurs in the Transverse and Peninsular Ranges from Santa Barbara County to San Diego County and northern Baja California (Buck, Taylor, & Knuckeberg 1993, CalFlora 2002, California Natural Diversity Database 2004).

Distribution in the Planning Area

Two occurrences are on the Los Padres National Forest in the San Rafael and Santa Ynez Mountains, one near Madulce Peak and one near Divide Peak. At least one occurrence is on the San Bernardino National Forest and other occurrences reported from the San Jacinto, and Santa Rosa Mountains are on or adjacent to the San Bernardino National Forest (California Natural Diversity Database 2004). Occurrences at the south end of the Laguna Mountains are on or adjacent to the Cleveland National Forest (California Natural Diversity Database 2004).

Taxonomy and Natural History

Streptanthus campestris is a dicot in the mustard family (Brassicaceae).

Streptanthus campestris is a short-lived perennial that is 1-2 feet (3-6 dm) tall. The basal leaves are obovate to oblanceolate and 2-4 inches (5-10 cm) long. The cauline leaves are lance-oblong and clasping. The inflorescence is an open raceme, 8-14 inches (2-3.5 dm) long. The purple sepals are 0.3-0.4 inches (7-10 mm) long with bristly tips. The petals are 0.35-0.5 inches (9-12 mm) long with yellow bases and purple tips. The fruit is spreading to ascending with oblong, winged seeds. Flowering

typically occurs from May–July (California Native Plant Society 2001).

Habitat Description

Streptanthus campestris grows on rocky soils in chaparral (including high desert transitional chaparral), conifer forest, and pinyon-juniper woodlands (California Native Plant Society 2001).

Occurrence Status

Streptanthus campestris is distributed in a limited number of occurrences but currently is not considered to be at risk of extinction (California Native Plant Society 2001). Vulnerability of southern jewelflower on National Forest System lands is moderate (Stephenson and Calcarone 1999). Population trends for occurrences in the Peninsular Ranges appear to be stable (Reiser 1994), although little information is available for other populations. The Divide Peak occurrence in the Los Padres National Forest was visited in 1994 and found to be a "frequent understory herb" (Taylor 1994).

Threats

No threats to *Streptanthus campestris* have been identified on National Forest System lands. The closely related *Streptanthus bernardinus* appears to be somewhat tolerant of disturbance.

Conservation and Management Considerations

More information is needed on occurrences and potential threats on National Forest System lands.

Evaluation of Current Situation and Threats on National Forest System Lands

Streptanthus campestris is uncommon on the national forests of southern California, known only from a hand full of locations on or adjacent to the Cleveland, Los Padres, and San Bernardino national forests, and no threats have been identified for these locations.

Based upon the above analysis *Streptanthus campestris* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Streptanthus campestris is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Streptanthus campestris* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Streptanthus campestris* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

Literature Cited

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Stylocline masonii

Stylocline masonii Morefield (Mason's neststraw)

Management Status

Federal: Forest Service: None; Bureau of Land Management: Sensitive

California: None

Heritage Rank: G1, S1.1 – very threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

General Distribution

Stylocline masonii is endemic to the southern San Joaquin Valley and the hills and plains around the south end of the San Joaquin Valley. The California Natural Diversity Database (2004) includes seven occurrences of *Stylocline masonii*, from an occurrence in northern Los Angeles County (Soledad Canyon), 3 occurrences in Kern County (Cyrus Canyon in the Sequoia NF, plains west of Bakersfield, and 5 miles west of Rosedale) eastern San Luis Obispo County (Commatti Canyon and Cholame), and one occurrence in Monterey County (Pleyto); for more information regarding this collection see Painter 2004. The record from Solidad Canyon appears to be the only recent collection of this species.

Distribution in the Planning Area

This species is recorded from near, but not on, National Forest System land in southern California. *Stylocline masonii* has been reported from the Angeles National Forest (Stephenson and Calcarone 1999), however, this is the Solidad Canyon occurrence, which is actually just north of the ANF boundary. The record of *Stylocline masonii* near Camatta Canyon Ranch suggests that this species may occur nearby on the Los Padres National Forest.

Taxonomy and Natural History

Stylocline masonii is a dicot in the sunflower family (Asteraceae) (Morefield 1993). There are seven *Stylocline* species in California. *Stylocline masonii* is distinguished by the shape and size of the flower head, glabrous chaff scales, and fruit length (Morefield 1993).

Stylocline masonii is an annual herb that flowers March-May.

Habitat Description

Stylocline masonii grows on sandy soils and in washes in chenopod scrub and pinyon-juniper woodlands (California Natural Diversity Database 2004, Matthews 1997). Occurrences are reported at elevations of 330-3,900 feet (100-1,200 meters) (Stephenson and Calcarone 1999, California Native Plant Society 2001).

Occurrence Status

Stylocline masonii is found in several highly restricted occurrences and is considered to be in danger of extinction throughout its range (California Native Plant Society 2001). No populations on National Forest System lands are known. Populations may fluctuate on an annual basis in response to precipitation patterns (California Natural Diversity Database 2004). *Stylocline masonii* has only been collected once (1991) since 1971. Most of the known sites were surveyed unsuccessfully in 1989 (California Native Plant Society 2001).

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Stylocline masonii* (Mason’s nest-straw)

Occurrence No.	No. of Plants	Year Reported	Location/Land Owner	County
UC1587713 (Ross, Boyd and Arnseth) CNDDDB#1	U	1991	Acton, Solidad Canyon, 34.4753 N, -118.194 E; private.	LA
JEPS13053 (Bacigalupe), CNDDDB#5	U	1956	Commatti Cn, 11 miles south of Shandon; probably = Camatta Cn. (CNDDDB); ownership unknown (1-2mi North of LPNF, Santa Lucia RD boundary)	SLO
UC581171 (Mason), CNDDDB#6	U	1935	Cholame Valley	SLO

Hardham 3092 (RSA), CNDDDB#7	U	1958	San Antonio River, near Playto. Occurrence extirpated by inundation under San Antonio reservoir (CNDDDB).	MON
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- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *LA = Los Angeles County*
- *SBD = San Bernardino County*
- *SLO = San Luis Obispo County*
- *MON = Monterrey County*

Threats

Stylocline masonii is threatened by development and habitat disturbance on private land (California Native Plant Society 2001). No threats are listed for the occurrence found in Soledad Canyon (Ross and Boyd 1996), although no habitat protection or management is known for this site.

Conservation and Management Considerations

More information is needed on occurrences of and threats to the *Stylocline masonii*. National Forest System Lands with suitable habitat near reported occurrences should be surveyed during the flowering period.

Evaluation of Current Situation and Threats on National Forest System Lands

Stylocline masonii is not known from National Forest System lands.

Based upon the above analysis *Stylocline masonii* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Stylocline masonii* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any

predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Stylocline masonii*.

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Swertia neglecta

Swertia neglecta (Hall) Jepson (Pine green gentian)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3 S3.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 4 R-E-D Code 1-1-3

General Distribution

Swertia neglecta occurs in the outer South Coast Ranges, Transverse Ranges, and San Bernardino Mountains from Santa Barbara, Kern, and Ventura Counties to San Bernardino County (CalFlora 2002, Pringle 1993).

Distribution in the Planning Area

At least six occurrences of *Swertia neglecta* are known on the San Bernardino National Forest. Plants occur on carbonate soils in Holcomb Valley and Big Bear Valley some occurrences grow in association with Cushenbury puncturebract (*Acanthoscyphus parishii* var. *goodmaniana*), a federally listed species (Stephenson and Calcarone 1999). A review of all pre-1998 vegetation plot data sheets and maps created for the carbonate plant conservation study (USDA Forest Service 1996) may yield other locations of this taxon on the San Bernardino National Forest (Stephenson and Calcarone 1999). *Swertia neglecta* is also known from just west of Little Pine Flats in pebble plain habitat.

On Los Padres National Forest, *Swertia neglecta* has been documented from 8 locations and is locally common in areas of about 0.1 to 1.0 acre in size; some populations number over 1,000 plants. The total number of plants detected on the Los Padres National Forest during recent surveys of six occurrences was estimated at 6,780. It is found on the southern flanks of Mount Pinos (Seymour Creek and Lockwood Creek), on Alamo Mountain, and the upper headwaters of Piru Creek and the Cuyama River around San Guillermo Mountain in Ventura County, and it is reported from the Sespe River watershed near Rose Valley and from atop Big Pine Mountain in Santa Barbara County (Smith 1998).

There are about 20 occurrences of *Swertia neglecta* on the Angeles National Forest in the Chilao-Horseflats area (Stephenson and Calcarone 1999).

Taxonomy and Natural History

Swertia neglecta is a dicot in the gentian family (Gentianaceae) (Pringle 1993).

Swertia neglecta is a perennial herb that blooms May–July (California Native Plant Society 2001).

Habitat Description

Swertia neglecta grows on sandy or gravelly soil in lower and upper montane coniferous forests and pinyon-juniper woodlands at elevations of 4,600–8,200 feet (1,400-2,500 meters) (California Native Plant Society 2001). On the Los Padres National Forest, *Swertia neglecta* is commonly found in openings of pinyon and Jeffrey pine woodland and is most abundant on pebble plain-like substrates.

Occurrence Status

Swertia neglecta is found in sufficient numbers and wide enough distribution that the potential for extinction is considered to be low (California Native Plant Society 2001). Population trends for this species are unknown, but given the persistence of populations that were collected from during the 1930s and relocated during 2001 it is likely that at some locations population trends are stable.

OCCURRENCE DATA – *Swertia neglecta* (Pine green gentian) from Rancho Santa Ana botanic Garden herbarium

Occurrence No.	No. of Plants	Year Reported	Location/Land Owner	County
7746 (RSA)	U	1967	San Gabriel Mts./ANF/ S. slope Mount Waterman, on W. ridge/ T3N/R10W/NE 1/4 S24	SBD
69411 (RSA)	U	1921	San Gabriel Mountains/ ANF/ Pine Flats stream N. slope of San Gabriel Mts., elev. 4900 ft.	SBD

- *U = Unknown*
- * = *an occurrence number has not been assigned*

- *SBNF* = San Bernardino National Forest
- *LA* = Los Angeles County
- *SBD* = San Bernardino County
- *SLO* = San Luis Obispo County
- *MON* = Monterey County

Threats

This species is vulnerable to mining activities, road maintenance and recreation impacts from hiking, camping, horseback riding, and off-highway vehicle use (Stephenson and Calcarone 1999). One occurrence on the San Bernardino National Forest is in an area proposed for a limestone mine overburden site. The occurrence west of Little Pine Flat was burned in the 1999 Willow Fire and was affected by construction of dozer lines. Plants recovered well post-fire.

Conservation and Management Considerations

Further monitoring of *Swertia neglecta* occurrences on National Forest System lands is needed.

Evaluation of Current Situation and Threats on National Forest System Lands

Swertia neglecta has a narrow range on National Forest System lands in southern California but within this narrow range it is relatively common and widespread. No current or anticipated land management activities are likely to result in reductions in the species range though individual plants may be impacted.

Swertia neglecta has been documented to be resilient to prescribed fire. On the San Bernardino, plants recovered well after the September 1999 Willow Fire. Population sizes are not small and known populations appear to be sufficiently large to withstand incidental impacts that result from dispersed recreation and grazing. On the San Bernardino National Forest, plants on carbonate soils will receive a level of protection when the Carbonate Habitat Management Strategy is implemented. Where plants are found on the pebble plain habitat west of Little Pine Flat they will also benefit from implementation of the Pebble Plain Habitat Management Guide.

Based upon the above analysis *Swertia neglecta* has been assigned the following threat category:

3. Common or widespread in plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Swertia neglecta is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Swertia neglecta* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Swertia neglecta* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Symphyotrichum greatae

Symphyotrichum greatae (Parish) G. L. Nesom (Greata's aster)

Management Status

Federal: None

California: None

Heritage Rank: G2 S2.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Symphyotrichum greatae is known from the southern slopes of the San Gabriel Mountains (Allen 1993).

Distribution in the Planning Area

Symphyotrichum greatae is found on the Angeles National Forest, and potential habitat exists on the San Bernardino National Forest (Stephenson and Calcarone 1999). CalFlora (2002) lists 23 observations, several of which appear to be in locations on the southern Angeles National Forest, including Gold, Eaton, and Pacoima Canyons and Arroyo Seco.

Taxonomy and Natural History

Symphyotrichum greatae is a dicot in the sunflower family (Asteraceae). Recent systematic work on the asters has recognized a more narrow circumscription of the genus *Aster*, and the California taxa have been segregated into several smaller genera (Nesom 1994). If this treatment receives universal acceptance, the accepted name for Greatae's aster will be *Symphyotrichum greatae*.

Aster greatae is a perennial rhizomatous herb that blooms June–October (California Native Plant Society 2001).

It is difficult to distinguish this taxon from *Aster hesperius* and *Aster occidentalis* (Allan et. al. 1995).

Habitat Description

Aster greatae is found in moist places within foothill and lower montane conifer habitats, including broadleaved upland forest, chaparral, cismontane woodland, montane coniferous forest, and riparian woodland (California Native Plant Society 2001). It occurs at elevations of 980–6,600 feet (300–2,010 meters) (California Native Plant Society 2001). The Field Guide to Rare Plants on the Angeles National Forest describes habitat as "moist or dry places in canyons, 2000-4000 ft. in chaparral and southern oak woodland" (Allan et. al. 1995).

Occurrence Status

Symphyotrichium greatae is distributed in a limited number of occurrences but currently is not considered to be at risk of extinction (California Native Plant Society 2001). Population status and trends on National Forest System lands are unknown.

Threats

Specific threats to *Symphyotrichium greatae* on National Forest System lands have not been identified (Stephenson and Calcarone 1999).

Conservation and Management Considerations

More information is needed for occurrences on National Forest System lands.

Evaluation of Current Situation and Threats on National Forest System Lands

Symphyotrichium greatae is endemic to the San Gabriel Mountains and within this narrow range the species appears stable in distribution.

Based upon the limited amount of information available on *Symphyotrichium greatae* it has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Symphyotrichium greatae* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Symphyotrichium greatae* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Swertia neglecta

Syntrichopappus lemmonii

Syntrichopappus lemmonii

Syntrichopappus lemmonii (A. Gray) A. Gray (Lemmon's syntrichopappus)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3; S3.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 4; R-E-D Code 1-1-3

General Distribution

Syntrichopappus lemmonii is known from the inner South Coast Range, eastern part of the western Transverse Range, and San Gabriel, San Bernardino, and San Jacinto mountains in Monterey, Kern, Los Angeles, San Bernardino, and Riverside counties (California Native Plant Society 2001, Johnson 1993).

Distribution in the Planning Area

Syntrichopappus lemmonii has been collected on the Angeles and San Bernardino national forests. Collections were made on the north slope of the San Gabriel Mountains, in Little Rock Creek canyon and Pinyon Ridge, and on the north slope of the San Bernardino Mountains near Cajon Pass and in the Deep Creek watershed (CalFlora 2000). Four occurrences are documented on the San Bernardino National Forest. There is potential habitat for this species on the Los Padres National Forest (USDA Forest Service 2003). It is documented from Fort Hunter Liggett (Painter 2004).

Taxonomy and Natural History

Syntrichopappus lemmonii is a diminutive member of the sunflower family (Asteraceae). *Syntrichopappus lemmonii* is an annual herb that blooms April–May (California Native Plant Society 2001). Because *Syntrichopappus lemmonii* is an annual, there may be significant fluctuation in population size; surveyors should take this into account when conducting focused surveys for this species. *Syntrichopappus lemmonii* is one of two *Syntrichopappus* species in California. *Syntrichopappus lemmonii* is distinguished from *Syntrichopappus fremontii* by its white ligulate flowers with red veins. *Syntrichopappus fremontii* has yellow ligules (Johnson 1993).

Syntrichopappus lemmonii is a more or less erect plant, sometimes becoming glabrous. The leaves are 3-8 mm and linear with obtuse tips. The inflorescence is characterized by 3-15 mm reddish peduncles, a 4-5 mm involucre, and 5-8 phyllaries. Ray flower ligules are 2-3 mm, white above, pinkish purple below, and red-veined. Fruit are 2-2.5 mm and (sub)glabrous. The pappus is 0 or of less than 30 bristles that are about 1 mm. (Johnson 1993).

Habitat Description

Syntrichopappus lemmonii grows on sandy or gravelly soils within chaparral, Joshua tree woodland, and pinyon/juniper woodland, at elevations of 2,900–4,900 feet (520–1,830 meters) (California Native Plant Society 2001). This plant is abundant after fires. In the Little Pine Flats area of the San Bernardino National Forest, *Syntrichopappus lemmonii* was observed growing in areas that had previously been used for Motorcycle Events. In the Deep Creek Watershed, it also occurs on the cut banks of the Pacific Crest Trail.

Occurrence Status

Because this is a highly variable annual plant species, occurrences vary widely from year to year in terms of numbers and extent. All of the following recorded occurrences are considered to be extant.

The following table shows the recorded occurrences in/near the southern California National Forests, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Syntrichopappus lemmonii* (Lemmon's syntrichopappus)

Occurrence No. (CalFlora)	No. of Plants	Year Reported	Location/Land Owner	County
1823034	U	1941	Mint Canyon. Near top of grade. Land owner: U. (on/near ANF)	LA
1190355	U	1960	About 2 mi. above and S of Little Rock-Palmdale Dam. Ridge between mouth of Kitter Canyon and Little Rock Creek Canyon. N base of San Gabriel Mountains ANF.	LA
1377707	U	1895	Manzanita. Land owner: U.	LA

1407722	U	1927	Pinyon Ridge, San Gabriel Mountains. ANF.	LA
1191728	U	1948	Little Rock above desert foothills of the San Gabriel Mountains. ANF.	LA
1462472	U	1880	San Bernardino plains. Land owner: U.	SBD
1191763	U	1948	W of Willow Canyon. Next tributary of Deep Creek. San Bernardino Mountains. SBNF.	SBD
1332463	U	1979	ca. 1 mi. ENE of Bowen Ranch; on Mojave Desert slopes, N side of San Bernardino Mountains. PVT.	SBD
1131315	U	1963	3 mi. NE of Cajon Pass [Antelope Valley, Hisperia]. Land owner: U.	SBD
1199181, 1276251	U	1921, 1906	Near summit of Cajon Pass. SBNF.	SBD
1412898	U	1935	3 mi. SE of mouth of Deep Creek. SBNF	SBD
*	U	U	Little Pine Flats area, east side of 3N14. SBNF.	SBD
*	U	2003	Garner Valley, near Morris Ranch Road. On low ridges at the edge of meadows. With <i>Arabis johnstonii</i> and <i>Androsace elongata</i> ssp. <i>acuta</i> . SBNF.	RIV
*	80	2004	Rouse Meadow (Hawke)	RIV

- *U = Unknown*
- * = *an occurrence number has not been assigned*

- *SBNF* = San Bernardino National Forest
- *ANF* = Angeles National Forest
- *SBD* = San Bernardino County
- *LA* = Los Angeles County
- *RIV* = Riverside County

Threats

Potential threats to this species include off road vehicle damage and exotic annual grass invasion promoted by (and promoting) frequent fire. This species is tolerant of low to moderate disturbance.

Conservation and Management Considerations

The primary conservation strategy for this species is to improve the knowledge of its distribution. The following is a list of conservation practices that should be considered for *Syntrichopappus lemmonii*:

- Survey all new occurrences of *Syntrichopappus lemmonii* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Syntrichopappus lemmonii* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Syntrichopappus lemmonii* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Syntrichopappus lemmonii is endemic to the southern and central California trans-montane foothills. It is either poorly collected or conspicuously rare throughout its range. While this species is recorded from only eight localities on NFS land in the southern California national forests, its habitat is relatively widespread, under-surveyed, and exposed to a relatively low-level of threats. Suitable habitat is distributed across the desert transition areas of the SBNF, ANF and LPNF, and it is possible that the species is patchily distributed throughout this area. While the recorded occurrences may be vulnerable to identified threats, this species has been observed to tolerate minor to moderate disturbance.

Based on this analysis, *Syntrichopappus lemmonii* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Syntrichopappus lemmonii is on the San Bernardino National Forest Watch list. During project surveys,

information will be recorded on occurrences of *Syntrichopappus lemmonii* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Syntrichopappus lemmonii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcomes for all Land within Range of Taxon

By maintaining the current distribution of *Syntrichopappus lemmonii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Taraxacum californicum

Taraxacum californicum Munz & I.M. Johnston (California taraxacum)

Management Status

Federal: Endangered

California: G2; S2.1 (California Department of Fish and Game)

California Native Plant Society - List 1B; R-E-D Code 3-2-3 (California Native Plant Society 2001).

General Distribution

Taraxacum californicum is endemic to the northeastern San Bernardino Mountains in San Bernardino County. Occurrences in the San Bernardino Mountains range from Big Bear and Holcomb valleys to South Fork Meadows in the Santa Ana River watershed. Thirty-eight extant occurrences are known (California Department of Fish and Game 2004). Seven additional occurrences have been added to the table below: three of which were obtained from Rancho Santa Ana Botanic Garden Herbarium (RSA), three were obtained from CalFlora (2002), and one from University of California Berkeley Herbarium (UC SMASCH).

Distribution in the Planning Area

Twenty-nine occurrences of *Taraxacum californicum* are documented on the San Bernardino National Forest (California Department of Fish and Game 2004). Nine other occurrences are on state, municipal, and private lands adjacent to National Forest System lands. The San Bernardino National Forest has mapped many of these occurrences at a higher resolution, identifying 73 specific localities for this species. Of these localities, 53 are on National Forest System lands, with the remainder on private lands (USDA Forest Service 2003).

Taxonomy and Natural History

Taraxacum californicum is a dicot in the sunflower family (Asteraceae). Only two species of the genus *Taraxacum* are known to occur in California. The other species, common dandelion (*T. officinale*), is a widespread nonnative species introduced from Europe (Stebbins 1993). *Taraxacum californicum* appears to hybridize with common dandelion (U.S. Fish and Wildlife Service 1998).. *Taraxacum*

officinale is apomictic (reproduces without fertilization), but produces fertile pollen while *Taraxacum californicum* produces solely by outcrossing. Theoretically, pollen from *T. officinale* could be involved in hybridization with *T. californicum* (Burger pers. comm. 2003). Morphological intermediates between these two species have been observed at several locations (Eliason pers. comm.).

Taraxacum californicum is a perennial herb that flowers from May through August (California Native Plant Society 2001). It is a self-incompatible, outcrossing species (Lyman and Ellstrand 1998). Leaves are oblanceolate, glabrous, and toothed or shallowly lobed. The inflorescence is characterized by solitary scapes, exceeding the leaves in fruit. Flowers are many in 2.2-3 cm diameter heads. The flowers are light yellow and 2-3 mm longer than the involucre. The outer phyllaries are 5-7 mm and erect. The inner phyllaries are rounded to truncate. The fruit are pale brown. The fruit body is approximately 3 mm long and is tubercled near the tip (Stebbins 1993; California Native Plant Society 1980).

Habitat Description

Taraxacum californicum occurs in mesic meadows and seeps, usually in areas free of taller vegetation, at elevations of 5,500-8,500 ft (1,675-2,590 m) (California Department of Fish and Game 2004). It is often associated with San Bernardino bluegrass (*Poa atropurpurea*), another federally listed species.

Taraxacum californicum occurs on meadow margins, and less frequently in the wetter areas of meadows. The USDA Forest Service (2000) describes the species as generally occurring in the moister portions of meadows, often along stream channels, in depressions, or in areas of saturated soils among typical wetland plants such as rushes and sedges, which are usually absent from drier portions where meadows intergrade with sagebrush. However, this species also occurs in the relatively open drier edges of the meadows, apart from more mesic plants (U.S. Fish and Wildlife Service 1998). The species appears to occur on microsites with relatively little accumulation of graminoid thatch, even though the species is tightly associated with wetland graminoids such as *Elymus*, *Poa*, *Juncus*, and *Carex* species. Relative abundance of the plants between these zones seems to vary within and between years with changes in soil moisture (USDA Forest Service 2003).

There are approximately 4,430 acres of meadow habitat distributed in the San Bernardino and San Jacinto mountains (USDA Forest Service 2002). Meadow habitat is sensitive to activities that alter hydrology, remove vegetation, or cause soil erosion, especially during the winter and spring when soils are wettest. In meadow systems, particularly those on steeper slopes, erosion removes topsoil and fine-textured alluvium, resulting in gully formation. The resulting channelized surface runoff causes increased erosion and stream incision, channeling water away from the meadow and effectively lowering the water table. Over time, increased drainage of meadow soils can lead to a shift in floristic composition to more drought-tolerant species and tree and shrub species. Grazing and trampling by livestock and other ground disturbances by recreational users such as hikers, mountain bikers, and vehicle use off classified roads encourage the establishment and spread of nonnative species which degrade meadow habitat (USDA Forest Service 2003).

Occurrence Status

Much of the montane meadow habitat that historically occurred in the Big Bear Valley was lost due to the creation of Big Bear Lake and because of urban and recreational development. Ten occurrences on private land have either been extirpated or are substantially degraded. The Wildlands Conservancy now protects occurrences on private lands at Bluff Lake and Cienega Seca. The North Baldwin occurrence is protected in part in a CDFG Ecological Reserve. Current population trends have not been measured but are likely declining. Most populations are small (fewer than 100 plants), and habitat degradation continues to occur. The non-native *Taraxacum officinale* is present at many of the sites (California Department of Fish and Game 2004).

All San Bernardino National Forest occurrences are at least partially protected from vehicle use off classified roads, although threats related to chronic hydrological changes, general dispersed recreation, and genetic swamping by common dandelion remain at many of the occupied meadows (USDA Forest Service 2003).

The following table shows the number of occurrences recorded in the literature, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Taraxacum californicum* (California taraxacum)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	1 in 1994 at N colony; 53 in 2000 in occ. #1 and #3	2000	South Fork Meadows, 2 mi. W of Grinnell Mountain. S Fork of the Santa Ana River, San Bernardino Mtns. Montane meadow. High meadows in river canyon. w/ <i>Sphenosciadium capitellatum</i> , <i>Carex senta</i> , <i>Heracleum lanatum</i> , <i>Carex senta</i> , <i>Salix lasiolepis</i> , <i>Veratrum californicum</i> , <i>Solidago confinis</i> , <i>Urtica dioica</i> var. <i>holosericea</i> , <i>Stachys</i> sp. 4 colonies extending ca. 0.5 mi. N of S Fork Mdws along the S Fork Santa Ana River to just SE of meadows. Heavily used trails nearby. Meadow is virtually undisturbed, but has some trash. Incl. former occ. #8. SBNF-San Gorgonio Wilderness.	SBD

2	< 1000 in 1983	1983	Cienega Seca, Oxyx Peak, San Bernardino Mtns. In montane meadow on organic soils w/ high clay content. w/ <i>Poa atropurpurea</i> , <i>Juncus</i> , <i>Carex</i> . Site proposed for RV campground. PVT-owned by Boy Scouts.	SBD
3	1 at S colony in 1994; 53 in 2000 in N colony and occ. #1	2000	S Fork Santa Ana River, ca. 0.5 mi. SE of Poopout Hill, San Bernardino Mtns. 2 colonies ca. 1-1.3 mi. downstream from S Fork Meadows. In wet meadow w/ <i>Salix</i> spp., various graminoids, <i>Sisyrinchium bellum</i> , <i>Achillea millefolium</i> , <i>Rosa woodsii</i> , <i>Veratrum californicum</i> , <i>Dodecatheon</i> , <i>Taraxacum officinale</i> , <i>Mimulus</i> , <i>Ribes</i> , <i>Trifolium</i> , <i>Polygonum bistortoides</i> . Heavily used trails nearby. Meadow is virtually undisturbed, except for some trash. SBNF.	SBD
4	U	1977	Heart Bar Creek, 1.5 air mi. S of Heart Bar Peak, San Bernardino Mtns. SBNF.	SBD
5	19 in 2000; 20 in 2002	2000	Horse Meadow, S of Barton Flats, ca. 2 mi. SW of confluence of S Fork w/ Santa Ana River, San Bernardino Mtns. Moist meadow w/ <i>Poa pratensis</i> , grasses, sedges, rushes, <i>Potentilla wheeleri</i> , <i>P. gracilis</i> , <i>Geranium richardsonii</i> , <i>Horkelia rydbergii</i> , <i>Muhlenbergia rigens</i> , <i>Rosa woodsii</i> , <i>Taraxacum officinale</i> , <i>Tragopogon</i> , <i>Salix</i> . 2 colonies on N and E sides of meadow. Significant number of <i>T. officinale</i> w/in and surrounding <i>T. californicum</i> . Loss of genetic diversity through hybridization is a	SBD

			threat. Very little ground disturbance. SBNF.	
6	146 in 2000	2000	Upper Fish Creek Meadows, ca. 2.9 mi. NW of summit of San Gorgonio Mtn. Wet meadow dominated by <i>Salix</i> spp., <i>Horkelia</i> spp., grasses, <i>Sisyrinchium bellum</i> , <i>Potentilla gracilis</i> , <i>P. wheeleri</i> , <i>Veratrum californicum</i> , <i>Mimulus</i> spp., <i>Chenopodium</i> spp., <i>Achillea millefolium</i> . <i>Taraxacum officinale</i> present. 2 colonies at W edge of Fish Creek Meadows. SBNF.	SBD
7	U	1942	Meadow, S base of Sugarloaf Mtn. Wet Meadow at 8000 ft. SBNF.	SBD
9	U	1977	Just E of town of Sugarloaf, San Bernardino Mtns. SBNF.	SBD
10	U	1977	ca. 0.9 mi. E of Fish Creek Meadows, San Bernardino Mtns. SBNF.	SBD
11	U	1924	E fork of Lost Creek, ca. 1 mi. N of Grinnell Mtn. SBNF.	SBD
12	U	1977	Green Canyon, 0.25 mi. NW of Green Springs, San Bernardino Mtns. SBNF.	SBD

13	3 at W colony and 142 at E colonies in 2000	2000	Bluff Lake, 1.8 mi. SW of town of Boulder Bay. 6 colonies. Plants occur from 0.2 mi. W of Bluff Lake to 0.4 mi. E of Bluff Lake. Wet meadow interspersed w/ <i>Pinus jeffreyi</i> . Assoc. w/ <i>Sidalcea pedata</i> , other sensitive spp, <i>Ranunculus</i> spp., <i>Achillea millefolium</i> , <i>Potentilla gracilis</i> var. <i>fastigiata</i> , <i>Horkelia rydbergii</i> , <i>Veratrum californicum</i> . Heavily grazed in past and formerly used as recreation camp. Diesel fuel spill in lake adj. to meadow in 1982. PVT-The Wildlands Conservancy.	SBD
14	U	1901	Seven Oaks Camp, San Bernardino Mtns. Mapped near Seven Oaks resort. Surveyors should check along Converse Creek and near the town of Seven Oaks. SBNF.	SBD
16	U	1977	Btw. HWY 18 at Metcalf Bay & Coldbrook Campground, San Bernardino Mtns. Occurs w/ several other rare spp. PVT.	SBD
17	10 in 2000	2000	N end of Baldwin Lake, San Bernardino Mtns. w/ <i>Plagiobothrys tenellus</i> , <i>Potentilla</i> , <i>Plantago</i> , <i>Eriogonum kennedyi</i> , <i>Thelypodium stenopetalum</i> , <i>Sidalcea pedata</i> , other sensitive plants. PVT upstream development, ORVs, trash, woodcutting, past burro trampling, quartzite theft = threats. Partly fenced in 1984; fence completed in 2000. Incl. former occ. 27. SBNF/CDFG/TNC/PVT.	SBD

19	U	1924	Arrastre Flat, San Bernardino Mtns. SBNF.Lat:34'18'10"N / Lon:116'51'50"W, (Johnston/RSA)	SBD
20	U	1988	W end of Holcomb Valley, San Bernardino Mtns. Area is unprotected from ORVs. Meadow with grasses and sedges surrounded by Jeffrey pine forest and pebble plain. Other rare spp. = <i>Poa atropurpurea</i> , <i>Pyrrocoma uniflora gossypina</i> , <i>Castilleja lasiorhyncha</i> , <i>Perideridia parishii</i> . Exotics also present. Grazing has eliminated or reduced sensitive spp. <i>Taraxacum officinale</i> is abundant. Area threatened by other activities. SBNF/PVT (Boy Scouts).	SBD
21	U	1988	Big Bear Lake, from Eagle Point to 0.4 mi. W of Stanfield Cutoff. Meadow, some on clay soils w/ quartzite cobble substrate. w/ <i>Packera bernardina</i> , <i>Poa atropurpurea</i> , <i>Thelypodium stenopetalum</i> , <i>Sidalcea pedata</i> , <i>Pyrrocoma uniflora gossypina</i> plus some pebble plain spp. PVT development, ORV use, dumping of dredge material, trampling by visitors, possible invasion by weeds. Incl. former occ. 23. PVT.	SBD
22	U	U	Bear Valley Golf Course (Moonridge), San Bernardino Mtns. Few plants seen by Krantz several years ago. Unknown if still extant. PVT.	SBD

24	< 10	1985	Pan Hot Springs, Baldwin Lake. On edge of meadow near elevated area of sagebrush scrub, assoc. w/ <i>Sidalcea pedata</i> , <i>Ranunculus</i> , <i>Plantago</i> . Area heavily used by nesting waterfowl. Excessive horse grazing in meadow. City of Big Bear.	SBD
25	U	1989	Upper Holcomb Valley. In wet meadow and pebble plains assoc. w/ <i>Thelypodium stenopetalum</i> and other sensitive spp. Needs fieldwork. SBNF. Occurrence is extant as of 2001 (Kopp)	SBD
26	U	1984	Erwin Lake. Nearly pristine wet alkaline meadow w/ high densities of <i>Thelypodium stenopetalum</i> , 11 other sensitive plant species. Wintering bald eagle and waterfowl habitat. Area mostly undisturbed and fenced. No hunting allowed. Grazing confined to non-sensitive areas. No formal protection. PVT.	SBD
28	U	1981	Lower Shay Meadow, Big Bear Valley. In meadow. PVT.	SBD
29	4 at S colony, 2 at N colony in 2000	2000	S of Big Bear Lake, 0.5 mi. S of Cedar Lake along FR 2N10, Metcalf Creek drainage. 2 colonies. Site is 2 mi. along Mill Creek Rd. and 2N10 from Coldbrook Campground. Wet meadow dominated by <i>Salix</i> , various grasses, <i>Taraxacum officinale</i> , <i>Achillea millefolium</i> , <i>Polygonum bistortoides</i> , <i>Perideridia parishii parishii</i> . Vehicle tracks from a single vehicle; some signs of littering. Land owner: U.	SBD

30	U	1988	N shore of Big Bear Lake, between shore and Hwy 38 near Big Bear Solar Observatory. In meadow adj. to lake. Campground development and visitor use are present threats. SBNF.	SBD
31	U	2000	Fish Creek Meadow, ca. 3.2 mi. NE of summit of San Gorgonio Mtn. Wet meadow dominated by grasses, <i>Potentilla gracilis</i> , <i>P. wheeleri</i> , <i>Horkelia</i> spp., <i>Salix</i> spp., <i>Sisyrinchium bellum</i> , <i>Chenopodium</i> sp. Also w/ <i>Ribes</i> , <i>Poa pratensis</i> , <i>Rosa woodsii</i> , <i>Equisetum</i> , <i>Castilleja miniata</i> . Meadow is undisturbed, but high numbers of <i>T. officinale</i> are here. Trails run around meadow in forested area. SBNF.	SBD
32	100 in 2001	2000	SE of Broom Flat, 1.1 mi. just SSW of Yocum Spring, W of Juniper Springs Campground. Semi-alkaline moist meadow dominated by <i>Potentilla gracilis</i> , <i>Iris</i> , <i>Achillea millefolium</i> , <i>Horkelia rydbergii</i> , <i>Trifolium</i> spp., <i>Potentilla wheeleri</i> . Sagebrush occurs at edge of meadow. <i>Taraxacum officinale</i> occurs throughout site. Visible disturbance incl. past cattle trampling and feces, vehicle tracks. SBNF.	SBD

33	2 in 2000	2000	Bow Canyon, S edge of Moonridge, ca. 0.7 mi. ESE of Gold Mine Ski Area. Moist to wet meadow surrounded by <i>Salix</i> . Dominants incl: <i>Geranium richardsonii</i> , <i>Aster</i> , <i>Veratrum californicum</i> , <i>Ranunculus californica</i> , <i>Horkelia</i> , <i>Lupinus</i> , <i>Viola</i> , <i>Urtica dioica</i> , <i>Dodecatheon</i> , <i>Achillea millefolium</i> , <i>Taraxacum officinale</i> , and grasses. Close to well-used trail and homes, but only minimal ground disturbance and garbage. Currently no signs or fences delineate PVT and SBNF land. SBNF.	SBD
34	135 in this occ. and occ. 35 in 2000	2000	Just W of Wildhorse Spring, 0.5 mi. ENE of Wildhorse Meadows, E of Sugarloaf Mtn, S of Big Bear City. Moist-wet meadow dominated by <i>Taraxacum officinale</i> , <i>Geranium richardsonii</i> , grasses, <i>Potentilla gracilis</i> , <i>Sisyrinchium bellum</i> , <i>Mimulus</i> spp. Soil is dark and organic. SW slopes. Hybridization w/ <i>T. officinale</i> is a potential threat. Recreational use is a possible threat, but meadow appears untouched. SBNF.	SBD
35	135 in this occ. and occ. 34 in 2000	2000	Wildhorse Meadows, 2 mi. E of Sugarloaf Mtn., S of Big Bear City. Moist-wet meadow dominated by <i>T. officinale</i> , <i>Geranium richardsonii</i> , grasses, <i>Potentilla gracilis</i> , <i>Sisyrinchium bellum</i> , <i>Mimulus</i> spp. Soil is dark and organic. SW slopes. Hybridization w/ <i>T. officinale</i> is a potential threat. Recreational use is a possible threat, but meadow appears untouched. SBNF.	SBD

36	5 in 2000	2000	Just above Big Meadows, ca. 0.4 mi. SSW of Heart Bar Campground, Santa Ana River, San Bernardino Mtns. Moist-dry meadow w/ <i>Salix</i> , <i>Horkelia rydbergii</i> , <i>Potentilla wheeleri</i> , <i>Potentilla</i> spp. Moist organic soil, N aspect. Along Santa Ana River horse trail. Horse trail through site. SBNF.	SBD
37	2 in 2000	2000	Fish Creek Trailhead, 0.3 mi. NE of N end of Fish Creek Meadows, 2.1 mi. SSE of Heart Bar Campground. Wet meadow w/ grasses, <i>Equisetum</i> , <i>Salix</i> , <i>Artemisia</i> , <i>Abies concolor</i> , <i>Pinus jeffreyi</i> , <i>Pteridium aquilinum</i> , <i>Horkelia rydbergii</i> , <i>Artemisia dracunculus</i> , <i>Keckiella</i> , <i>Poa pratensis</i> , <i>Geranium richardsonii</i> . Very little to no ground disturbance, but hybridization w/ <i>T. officinale</i> may occur. 4 individuals observed that looked like hybrids. SBNF.	SBD
38	4 in 2000	2000	Upper Red Ant Canyon, ca. 0.7 mi. E of Elsie Caves, S of Big Bear Lake. Plants are S of FR 2N08 on E side of meadow. Wet meadow surrounded by conifer forest w/ <i>Veratrum californicum</i> , <i>Scirpus microcarpus</i> , <i>Rosa woodsii</i> , <i>Geranium richardsonii</i> , <i>Potentilla gracilis</i> , <i>Horkelia rydbergii</i> , <i>Dodecatheon</i> , <i>Lupinus</i> , <i>Salix</i> , <i>Taraxacum officinale</i> . No visible disturbances. Possible threats incl. development of a foot trail from nearby campground through meadow. SBNF.	SBD

39	22 in 2000	2000	Spring between Grandview Point and Merriman Meadows, 1.3 mi. SE of Cedar Lake, S of Big Bear Lake. Plants found in northern part of meadow in shorter layers of shrubs. Moist-dry meadow w/ <i>Veratrum californicum</i> , <i>Geranium richardsonii</i> , <i>Salix</i> , <i>Horkelia rydbergii</i> , <i>Taraxacum officinale</i> , <i>Poa pratensis</i> , sedges, rushes, grasses. Moist organic soil. A few <i>T. officinale</i> plants present, including one possible hybrid. No visible disturbances. Threats = foot path to campgrounds, ORV road near meadow, hybridization. SBNF.	SBD
40	146 in W colony and 12 in other in 2000	2000	Sewage disposal facility, 2 airmi. E of Gold Mtn. summit, S edge of Baldwin Lake, Big Bear City. 2 small colonies. Moist meadow dominated by graminoids w/ <i>Potentilla anserina</i> , <i>P. gracilis</i> , <i>P. wheeleri</i> , <i>Achillea millefolium</i> , <i>Sisyrinchium bellum</i> , <i>Taraxacum officinale</i> , <i>Sidalcea pedata</i> , <i>Distichlis spicata</i> . Soil is dry to moist. A few lightly used trails through the meadow. Meadow is partially fenced. SBNF.	SBD
41	U	2000	NE end of Big Bear Lake, 0.6 airmi. SW of Blue Quartz Mine, W of Big Bear City. On sloping hill above a semi-bare area of alkaline soil. Dry meadow bordered by <i>Artemisia tridentata</i> , <i>Pinus jeffreyi</i> , <i>Juniperus occidentalis</i> . Meadow plants incl. <i>Packera bernardina</i> , <i>Astragalus lentiginosus</i> var. <i>sierrae</i> , <i>Artemisia ludoviciana</i> , <i>Potentilla anserina</i> , <i>P. glandulosa</i> , <i>Horkelia</i> . No visible disturbance. Potential threats =	SBD

			creation of foot trail to lakeshore. SBNF.	
42	5 in 2 small patches in 2000	2000	N edge of Big Bear Lake, 0.5 mi. W of North Shore School, San Bernardino Mtns. Lakeshore meadow habitat dominated by grasses, sedges, rushes, <i>Potentilla anserina</i> , <i>Potentilla</i> spp. Some patchy stands of <i>Juniperus occidentalis</i> , <i>Salix</i> spp. A few plants located directly w/in one of the lightly used foot paths. Potential for increased foot traffic. SBNF.	SBD
43	14 in W colony, 13 in E colony in 2000	2000	S of Big Bear Ranger Station, 1 mi. W of N Shore School, N edge of Big Bear Lake. A few plants located w/ in foot path. Meadow adjacent to pinyon-juniper woodland mixed w/ sagebrush. Dominated by <i>Potentilla</i> , <i>Poa</i> , <i>Carex</i> , <i>Juncus</i> , <i>Aster occidentalis</i> , <i>Potentilla glandulosa</i> , <i>Muhlenbergia rigens</i> , <i>Achillea millefolium</i> . 2 colonies near lakeshore. Trash, potential for increased path use, hybridization = threats. Fence was moved to protect W colony in 2001 (Kopp). SBNF.	SBD
337850 (RSA)	U	1979	Holcomb Valley, along Holcomb Creek below Hitchcock Ranch, where 3N12 crosses the creek, on open sagebrush flat, and dolomite slopes, elev. Ca. 7150 ft. (Thorne/RSA)	SBD
6215 (RSA)	U	1986	Mare Flats, elev. 8000 ft. (Crawford/RSA)	SBD

474574 (RSA)	U	1976	San Bernardino Mountains, NW end of Baldwin Lake, NW of Highway 38. Elev.ca. 6500 ft. Stabilized sand dune area with much desert vegetation, Pinyon-Juniper transition, assoc. with Artemisia tridentate, Purshia glandulosa, Opuntia, Sitanion hystrix. (Davidson/RSA)	SBD
801940 (CalFlora)	U	1989	San Bernardino Mts. Caribou Creek near Belleville, SW ¼ of S33/ T3N/ R1E. Elev. 7300ft. Moist meadow and Jeffrey pine forest near historic log cabin. (Taylor/CalFlora)	SBD
801939 (CalFlora)	U	1989	San Bernardino Mts., Bear Valley, hill in SW ¼ of SW ¼ S31/T3N/ R2E. Elev. 6800 ft. (Taylor/CalFlora)	SBD
1815478 (CalFlora)	U	1930	Twin Peaks Post Office, San Bernardino Mts. (Munz/CalFlora)	SBD
UC1536064 (SMASCH)	U	1976	2 mi. along 2N10 from Coldbrook Campground, near Mill Creek Rd. San Bernardino Mts. Thorne, DeBuhr, Davidson, Tilforth/CalFlora)	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *CDFG = California Department of Fish and Game*
- *TNC = The Nature Conservancy*
- *SBD = San Bernardino County*

Threats

Taraxacum californicum populations are currently subjected to a variety of impacts, including habitat

destruction, alteration, and fragmentation resulting from urban and recreational development; alteration of hydrologic regimes; unauthorized grazing by livestock, grazing by feral burros; hybridization with common dandelion; mining activities; and recreational activities (USDA Forest Service 2000, California Department of Fish and Game 2004). Disturbance favors establishment of the nonnative common dandelion, which appears to hybridize with *Taraxacum californicum*, creating concern about the genetic viability of the latter species (USDA Forest Service 2002).

The communities in Big Bear Valley have grown rapidly and are expected to experience increased growth through the next couple of decades. Most (approximately 70%) of the present and historical occurrences of *Taraxacum californicum* are on private lands and consequently lack federal protection under the Endangered Species Act. Increased urban development will continue to add to the pressures on the few remaining areas of private lands that support known occurrences or potential habitat. *Taraxacum californicum* lacks state protection on private lands.

As a meadow-obligate species, *Taraxacum californicum* is dependant on naturally functioning hydrology. Impacts or alterations to hydrology via diversions, extraction, erosion, stream incision, etc., threaten the viability of this species.

Approximately 9% (7.2 acres) of the known occurrences of *Taraxacum californicum* are under claim. Belleville Meadow is a popular prospecting site and several gold claims overlap the *Taraxacum californicum* occurrence. Effects to occupied habitat under claim do not occur at this time, and a site specific analysis would be completed prior to approval of a Plan of Operation, however effects from prospecting do occur. Direct impacts may result from ground-disturbing activities (*e.g.*, digging, sluicing, panning, storing/piling soil). Indirect impacts may occur as hydrological features of the landscape are changed (USDA Forest Service 2000).

A recovery plan for *Taraxacum californicum* is being developed but is not yet complete. It is likely that proper management of National Forest System lands will be crucial to the recovery of this species through protection of known occurrences, restoration/ reintroduction into historical and protected habitats, acquisition of lands that support occurrences or that are suitable for recovery efforts, and additional data collection and research to determine management needs (USDA Forest Service 2000).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Taraxacum californicum*:

- Implement strategies in the SBNF Meadow Habitat Management Guide and the USFWS Recovery Plan (when completed).
- Monitor and repair protective fence lines and signing in timely manner. Complete remaining habitat protection projects.
- Promote partnership for hybridization study.
- Apply the habitat suitability criteria and detection protocol developed for this taxon to surveys at

the project level.

- Survey all new occurrences of *Taraxacum californicum* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Collect a herbarium voucher specimen of *Taraxacum californicum* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Taraxacum californicum* in the planning area using SBNF data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Taraxacum californicum is considered to have high vulnerability on National Forest System lands (Stephenson and Calcarone 1999) because it 1) is endemic to a small area of land from Big Bear and Holcomb valleys to South Fork Meadows in the Santa Ana Watershed, 2) is restricted to montane meadows, a rare habitat type, 3) is present within mining claims, 4) is present within a high use recreation area, 5) is affected by dispersed and unclassified trail use, 6) is affected by changes in hydrological regimes, and 7) hybridizes with the nonnative *Taraxacum* species.

The trend for this species appears to be declining (Stephenson and Calcarone 1999). There is a possibility that future mining could affect the Belleville occurrence, however the probability is low. Habitat degradation caused by dispersed recreation, unclassified trail use, changes to hydrological regimes, unauthorized cattle grazing, and hybridization appear to be the largest threats at this time. The USDA Forest Service has identified activities that alter the hydrological function of meadow habitat for *Taraxacum californicum* (USDA Forest Service 2000). Specific activities include forest roads and trails, prospecting and dispersed recreation.

A large number of habitat protection measures for this species were implemented in 1999-2002 in locations prioritized as needing the most urgent protection. Monitoring of fence lines and signing occurs at high frequency and repairs are completed in timely manner. In 2001-2002, botanists surveyed additional occurrences and assessed threats when present. Therefore there are several additional locations that may benefit from habitat protection to reduce effects of unauthorized recreational use. The installation of fencing and interpretive signing and the restoration of an unclassified trail in 2001 have succeeded in providing additional protection to the northern Belleville Meadow occurrence. The southern portion of this occurrence along Caribou Creek continues to be affected by mountain bike use in the meadow despite several attempts to protect habitat. Funds were acquired in 2003 to provide additional protection at this location in 2004. An attempt has also been made to reduce unclassified trail use off the private property on to NFS lands at the South Baldwin Lake occurrence in 2002 by installing signing. Monitoring is needed to determine the extent of effects and types of protection measures needed from use of system trails, user created trails and effects of dispersed use at several other locations (occurrences 32, 36, 38, 42, and 43). The Broom Flat occurrence is within burro territory. Impacts appear to be minimal and consultation with the USFWS has been completed. Implementation of strategies listed in the SBNF Meadow Habitat Management Guide will provide continual protection for this species (USDA Forest Service 2002).

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	B	B	C	B	C	B

Taraxacum californicum is listed under the Endangered Species Act of 1973, as amended, as endangered, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

The viability of this species is primarily tied to protection and management of meadow habitat. With implementation of the SBNF Meadow Habitat Management Guide and practicable strategies in the USFWS Recovery Plan when completed, viability for this species on NFS lands is secure.

Under all alternatives, several occurrences (59 out of 194 occupied acres) would continue to be managed within the existing Baldwin Lake/Holcomb Valley Special Interest Area (SIA) established for the rare biological resources. Use of Forest-wide Standard S33 that instructs the Forests to manage SIA's so that activities and discretionary uses are either neutral or beneficial for the resource values for which the area was established will provide a higher level of protection than what is currently required within SIA's. Forty five of 194 acres of occupied habitat would retain management within the existing San Geronio Wilderness in all alternatives; this includes the Fish Creek occurrence. The South Fork of the Santa Ana River and Fish Creek are eligible as a wild and scenic river in all alternatives; these locations will be managed to retain their outstandingly remarkable values until a suitability analysis is completed.

Under Alternative 2, the South Baldwin Lake occurrence would be managed as a Critical Biological Zone. The Wildhorse occurrence would be provided extensive protection by designation of the Wildhorse Meadow Research Natural Area. The Fish Creek occurrence would be managed under the Fish Creek Meadows Special Interest Area. The Green Canyon occurrence would continue to be managed in a Back Country Non-Motorized zone. The Broom Flat occurrence would continue to be managed in a Back Country zone.

Under Alternative 3, the South Baldwin Lake occurrence would be managed as a Critical Biological

Zone. The Wildhorse occurrence would be managed within the recommended Wildhorse Meadow Research Natural Area. The Broom Flat occurrence would occur within the recommended Heartbreak Wilderness. The Green Canyon occurrence would be managed under the recommended Sugarloaf Wilderness.

Under Alternative 4, the South Baldwin Lake occurrence would be managed within a Critical Biological Zone. The Green Canyon occurrence would be managed within the recommended Sugarloaf Wilderness.

Under alternative 4a, the South Baldwin Lake occurrence would be managed within a Critical Biological Zone. The Green Canyon occurrence would occur within Back Country Motorized Use Restricted zoning; Broom Flat would be zoned Back Country. The Wildhorse occurrence would be managed within the recommended Wildhorse RNA.

Under Alternative 5, no Special Area designations are recommended and no land use zoning would benefit this species. In addition, the Green Canyon occurrence would receive reduced protection as zoning changed from Back Country Non-Motorized to Back Country. Roads and trails are pathways for the spread of invasive plant species into interior portions of the forest. Nonnative plant establishment, a documented impact to *Taraxacum californicum*, is more likely to increase under this alternative as larger numbers of unclassified roads become designated into the road and trail system.

Under Alternative 6, the South Baldwin Lake occurrence would be managed with a Critical Biological Zone. The Wildhorse occurrence would be managed within the Wildhorse Meadow Research Natural Area. The Green Canyon occurrence would be managed under the recommended Sugarloaf Wilderness (full wilderness proposal at this time, if wilderness boundary is reduced, this will not remain true). The Fish Creek Meadows Special Interest Area would also be designated. The Broom Flat occurrence would benefit from the current situation as zoning would change from Back Country to Back Country Non-Motorized. This is also true for the Bow Canyon occurrence where adjacent habitat would be managed as Back Country Non-Motorized.

Under Alternatives 2, 3, 4, 4a and 6, the South Baldwin Lake occurrence would be managed as a Critical Biological zone. Under alternatives 2, 3, 4a and 6, the Wildhorse occurrence would be provided protection within the Wildhorse Meadow Research Natural Area (RNA).

Special designations and zoning will play an important role in the protection and recovery of this species. In summary, Alternative 3 would provide the highest protection for this species, as the South Baldwin Lake Critical Biological Zone, the Wildhorse Meadow Research Natural Area and the Sugarloaf and Heartbreak Ridge Wilderness would be recommended for establishment. Alternatives 2, 4a and 6 would provide the second highest level of protection through designation of the South Baldwin Lake Critical Biological Zone and the Wildhorse Meadow Research Natural Area. Although designation of the Sugarloaf Wilderness in Alternative 4 is preferable, this would not change the current management of the Green Canyon occurrence to any noticeable degree because this occurrence is currently managed as Back Country Non-Motorized. Therefore Alternative 4 would provide lesser

protection than Alternatives 2, 3 and 6 due to non-designation of the Wildhorse Meadow Research Natural Area. Designation of the Heart Break Ridge Wilderness in Alternative 3 and changing the current zoning from Backcountry Motorized to Back Country Non-Motorized in Alternative 6 would also benefit this taxon.

In general, under Alternative 1, this species would be at continued risk from ongoing impacts to its habitat at approximately current levels. Alternatives 1 and 5 lack the ability to promote recovery through special designations or zoning. Under Alternative 5, there would be increased threats across the range of the species as a result of an increase in road and trail designation and use and additional water diversions/ extractions.

Hybridization of *Taraxacum californicum* with *T. officinale* reduces the potential for recovery and puts this taxon at high risk for extirpation. Therefore, even though *Taraxacum californicum* occurs over a wider range and there are more occurrences than some of the more restricted listed meadow species, viability outcomes are lower due to hybridization factor. Consideration of the Suitable Use restricting motorized and mechanized vehicle travel to designated Forest transportation system roads and trails, along with Standards for protection of listed species, recreation, riparian management, ground water extraction and mining factor in to the outcomes. Implementation of actions listed in the SBNF Meadow Habitat Management Guide and the USFWS Recovery plan (as practicable when completed) also factor in to the outcomes.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
C	C	C	C	C	C	C

Taraxacum californicum is a locally endemic species restricted to meadow habitat in Big Bear and Holcomb valleys and the Santa Ana River watershed. Hybridization has been observed on private land occurrences also (California Department of Fish and Game 2004). Horse grazing, vehicle use and housing development degrade and extirpate occurrences on private lands (California Native Plant Society 2001, California Department of Fish and Game 2004). As private land development increases, the demand for water and new diversions/extractions increases. This in turn increases the potential for changes in hydrological regimes that could affect wet meadow habitat. Maintenance of populations on NFS lands will contribute to recovery of this taxon; however conditions and situations related to development of private lands are expected to result in the loss of some occurrences over time.

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Syntrichopappus lemmonii

Tetracoccus dioicus

Tetracoccus dioicus

Tetracoccus dioicus Parry (Parry's Tetracoccus)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G3, S2.2 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B R-E-D Code 3-2-2

General Distribution

Tetracoccus dioicus, Parry's tetracoccus, is known from coastal southern California; the Peninsular Range foothills of Orange, Riverside, and San Diego counties; and Baja California, Mexico (Webster 1993, California Native Plant Society 2001). This species shows a preference for Los Posas soils (Reiser 1994).

Distribution in the Planning Area

One population was recorded in 1948 from National Forest System lands located near the San Juan Campgrounds, Trabuco Ranger District of the Cleveland National Forest (CNF) (California Natural Diversity Database 2004). Attempts to relocate this occurrence were unsuccessful in 2001 (Allen pers. comm.).

Taxonomy and Natural History

Tetracoccus dioicus is a deciduous shrub (0.5-3 m) in the Euphorbiaceae family that blooms from April–May (California Native Plant Society 2001). Plants are dioecious. This erect, branching species has grayish branches and reddish branchlets. Leaves are linear, 1.5-3 cm long, cuneate or rounded at the base, and sessile or with a short petiole. The staminate inflorescence is reddish, 2-8 flowers occur on slender pedicels 0.5-8 mm long. The calyx is 1 mm long and the filaments are hairy. Pistillate flowers are solitary, pedicellate, with a 2.5-5 mm long calyx. The capsule is 4-lobed, 8-10 mm long, and has smooth seeds (Webster 1993).

Habitat Description

Tetracoccus dioicus occurs on dry, stony slopes composed of gabbro-derived soils in chaparral and coastal scrub communities at elevations of 485–3,250 feet (165-1,000 meters) (California Native Plant Society 2001; California Natural Diversity Database 2004).

Occurrence Status

The California Natural Diversity Database lists 26 occurrences for *Tetracoccus dioicus*. On National Forest System lands there is one recorded occurrence from Cleveland National Forest located between the upper and lower San Juan Campgrounds (California Natural Diversity Database 2004). Attempts to relocate this one CNF occurrence were unsuccessful in 2001 (Allen pers. comm.). Other occurrences on protected federal or preserve lands are on The Nature Conservancy (2 sites), Bureau of Indian Affairs (3 sites on the Barona and Pala Indian Reservations), and one on Bureau of Land Management lands. The remaining occurrences (approximately 74%) are on privately owned lands. Many of these occurrences are old and/or unconfirmed records needing current population status reports. Some of the privately owned lands have over 100 to over 10,000 individuals.

OCCURRENCE DATA of *Tetracoccus dioicus* (Parry's Tetracoccus) on National Forest System lands

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
15	2-1	U	1948	W of Upper San Juan Campground / CNF	RIV

- U = Unknown
- * = an occurrence number has not been assigned
- CNF = Cleveland National Forest
- RIV = Riverside County

Threats

The population mapped between the upper and lower San Juan Campgrounds on the Cleveland NF has not been relocated. It is possible the location was mapped in a general manner and plants occur in the vicinity but not at the exact mapped location (Winter, pers. comm.). If it were to be relocated in the campground vicinity, effects from campground activities are expected to be minimal due to 1) previous closure of the lower San Juan Picnic Area to protect arroyo toad habitat, and 2) the upper San Juan Campground is only open annually from May-October, and 3) the area surrounding the campground is steep, and the species is a large shrub that would not be trampled (Winter, pers. comm.). Surveys for the

proposed widening of Highway 74 adjacent to the mapped location did not relocate plants and therefore would not affect the population (Winter pers. comm.). On private lands, habitat conversion for agricultural uses and development projects is adversely affecting the species (Stephenson and Calcarone 1999; California Native Plant Society 2001). Known impacts to occurrences on private lands include orchard expansion in the Pala Mesa area and disturbance related to residential expansion in the San Marcos Hills (Reiser 1994).

Conservation and Management Considerations

The following is a list of conservation practices that should be considered for *Tetracoccus dioicus*:

- Conduct surveys in suitable habitat in the vicinity of the historical location near San Juan Campground and protect populations if located.
- Conduct surveys of potential habitat along western edge of all districts, especially El Cajon Mountain, western Agua Tibia Wilderness, and Fallbrook Quads.

Evaluation of Current Situation and Threats on National Forest System Lands

Tetracoccus dioicus is considered to have low vulnerability of local extirpation on National Forest System lands based on the knowledge of only one occurrence that could not be relocated. There is potential for other populations of this species to occur on National Forest System lands that have not been discovered; surveys are needed in potential habitat especially in the vicinity of el Cajon Mountain (Winter pers comm.). Potential habitat for this species is being protected to some extent due to existing habitat protection measures for other rare, gabbro endemic plants both on and off National Forest system lands. Potential habitat would be minimally affected in the existing San Mateo Wilderness just located just south of the historical occurrence and in the Agua Tibia Wilderness Area on National Forest system lands. This species is dioecious; therefore protection of both male and female plants are important for reproduction.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in Plan area.

Viability Outcomes

Tetracoccus dioicus is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

No populations of *Tetracoccus dioicus* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions.

Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Tetracoccus dioicus*.

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Thelypodium stenopetalum

Thelypodium stenopetalum S. Watson (Slender-petaled thelypodium)

Management Status

Federal: Endangered

California: Endangered

Heritage Rank: G1; S1.1 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-3-3

There is no Critical Habitat designated or proposed for this species.

General Distribution

Thelypodium stenopetalum is endemic to the San Bernardino Mountains. The California Natural Diversity Database (2004) reports ten occurrences in Big Bear and Holcomb valleys and near Baldwin Lake. Two of the occurrences have been extirpated, and of the eight remaining occurrences, populations at the southwest end of Erwin Lake and at the southwest end of Big Bear Lake have not been recently documented and have been degraded or extirpated. The historical distribution of *Thelypodium stenopetalum* is not well known. It was once more common around Big Bear Valley, but habitat for the species has been reduced by an estimated 85% following construction of Big Bear Lake in the late 1800's and subsequent lakeshore development (U.S. Fish and Wildlife Service 1984).

Distribution in the Planning Area

Two occurrences are located on the San Bernardino National Forest. Belleville Meadow in Holcomb Valley supports the largest occurrence; a second occurrence at the south end of Baldwin Lake is partly on private land (USDA Forest Service 2000). The remaining occurrences are on state, City of Big Bear, and private lands.

Taxonomy and Natural History

Thelypodium stenopetalum is a dicotyledon in the mustard family (Brassicaceae). It is distinguished

from other *Thelypodium* species in California by its biennial growth habit, open inflorescence, sessile cauline leaves that are expanded to their base, and linear shaped petals (Rollins 1993).

Thelypodium stenopetalum is a biennial herb that generally flowers between May through August (California Native Plant Society 2001). Flowering stems are not produced until the second or third year. *Thelypodium stenopetalum* is a larval host plant for the rare Andrew's marble butterfly (*Euchloe hyantis andrewsi*). Eggs are laid at the tip of the flower stalk, and larvae feed on the upper fruit stalks. At the North Baldwin Lake occurrence, up to 20% of the *Thelypodium stenopetalum* plants showed insect damage (U.S. Fish and Wildlife Service 1998).

Thelypodium stenopetalum is a glabrous, glaucous biennial. The stems are more or less decumbent, 3-8 dm, and branched from the base. The basal leaves are 4-15 cm, oblanceolate to oblong, entire or wavy-margined, and thickish. Cauline leaves are ascending, sessile, 2-5 cm, more or less oblong-lanceolate, sagittate, clasping the stem, and more or less entire to few-toothed or shallowly lobed. The flower petals are linear, lavender or rarely white, and the blades are crinkled at the base. The paired filaments are free. The fruit are 3-5 cm, straight to more or less curved, cylindrical or rarely 4-angled, and more or less narrowed between seeds. The stalk above the receptacle is 0.5-3.5 mm, and stout. The pedicel is ascending, rarely more or less spreading, 4-8 mm, stout, and without a flat base. The style is 1-2 mm and slender. The embryonic root is at the edge or back of one of the cotyledons (Rollins 1993).

Thelypodium stenopetalum exhibits high variation in population size based on climatic conditions. It is much more abundant in years with average or above average precipitation than during drought years (USDA Forest Service 2003).

Habitat Description

Thelypodium stenopetalum is restricted to vernal wet meadows, alkaline flats, and lakeshores at elevations of 6,740–7,340 ft (2,054–2,237 m) (USDA Forest Service 2000). Populations tend to occupy the drier portions of meadow sites in sagebrush scrub dominated by *Artemisia nova* (less so by *Artemisia tridentata*) often in association with *Iris missouriensis*. Plants appear to utilize microhabitat sites under sagebrush, often germinating close to the base of the bushes.

Other associated species include *Gutierrezia sarothrae*, *Castilleja cinerea*, *Distichlis spicata*, *Oenothera californica*, and *Linum lewisii*. Soil moisture, alkalinity, and clay content appear to be important factors. *Thelypodium stenopetalum* also occurs in meadow-pebble plain ecotones. In these areas, it is associated with *Linanthus killipii*, *Mimulus exiguus*, *Mimulus purpureus*, *Castilleja lasiorhyncha*, *Poa atropurpurea*, *Pyrrocoma uniflora* var. *gossypina*, *Packera bernardina*, *Taraxacum californicum*, and *Sidalcea pedata* (U.S. Fish and Wildlife Service 1998).

There are approximately 4,430 acres of meadow habitat distributed in the San Bernardino and San Jacinto mountains (USDA Forest Service 2002). Meadow habitat is sensitive to activities that alter hydrology, remove vegetation, or cause soil erosion, especially during the winter and spring when the

ground is most saturated. In meadow systems, particularly those on steeper slopes, erosion removes topsoil and fine-textured alluvium, resulting in gully formation. The resulting channelized surface runoff causes increased erosion and stream incision, channeling water away from the meadow and effectively lowering the water table. Over time, increased drainage of meadow soils can lead to a shift in floristic composition to more drought-tolerant species and tree and shrub species.

Grazing and trampling by livestock and other ground disturbances by recreational uses such as hiking, mountain biking, and vehicle use off classified roads encourage the establishment and spread of nonnative species which degrade meadow habitat (USDA Forest Service 2003).

GIS analysis showed 455 acres of key habitat for *Thelypodium stenopetalum*, no additional occupied habitat, and 4,258 acres of modeled habitat in the San Bernardino Range.

Occurrence Status

There are approximately ten occurrences of *Thelypodium stenopetalum*, some of which have been extirpated. This species is in danger of extinction throughout its range (California Native Plant Society 2001). Belleville Meadow in Holcomb Valley supports the largest occurrence. The San Bernardino National Forest has monitored this occurrence for 10 years with population sampling along transects. A graduate student has plans to analyze the data and compile a report of findings. Although analysis is not complete, it appears that the Belleville Meadow occurrence fluctuates greatly with precipitation and climatic conditions, ranging between 500 and 75,000 plants depending on conditions. In 1998, it was estimated that *Thelypodium stenopetalum* inhabited approximately 12 acres of the meadow. The monitoring study began during an extended drought period, so the apparent increase may be a natural fluctuation related to rain/snowfall (USDA Forest Service 2000).

The following table shows the number of occurrences recorded in the literature and in SBNF files, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Thelypodium stenopetalum* (Slender-petaled thelypodium)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County

1	81 in 1998; 219 in 1992; 2091 in 1993; 2473 in 1994	1990	N shore of Baldwin Lake, S of Hwy 18. w/ <i>Sidalcea pedata</i> , <i>Taraxacum californicum</i> , <i>Poa atropurpurea</i> . Previous threats incl. upstream development, ORVs, woodcutting, burros, non-native spp., quartzite theft. Currently fenced. CDFG-Baldwin Lake Ecological Reserve.	SBD
2	U	1988	S shore of Big Bear Lake, just E of Eagle Point. In <i>Artemisia tridentata</i> meadows which are often on ecotone btw sagebrush and <i>Juncus/Carex</i> on alkaline clay. w/ <i>Sidalcea pedata</i> , <i>Taraxacum californicum</i> , <i>Packera bernardina</i> , <i>Poa atropurpurea</i> , <i>Pyrrocoma uniflora gossypina</i> . TNC established 15 acre preserve, much of the rest is to be developed. Parking lot destroyed part of population in 1980. ORV use and development are threats. PVT.	SBD
3	U	1984	E end of Erwin Lake. Nearly pristine alkaline wet meadow w/ high densities of <i>Thelypodium stenopetalum</i> . 11 other sensitive plant spp. in area. Mostly undisturbed and fenced. No hunting allowed and grazing confined to non-sensitive areas. Development threatens occurrence. PVT.	SBD

5	U	1984	SW of Erwin Lake to SE of Woodlands. Nearly pristine wet alkaline meadow w/ high densities of spp. 11 other sensitive plant spp. Mostly undisturbed and fenced. No hunting and grazing confined to non-sensitive areas. Development threatens occurrence. PVT.	SBD
6	< 50 in 1999; ~5000 in 2000	1980 2000	S shore Baldwin Lake, S of the Sewage Disposal Pond, N of Shay Rd. Dry meadow on alkaline clay soil w/ <i>Artemisia tridentata</i> , <i>Artemisia dracuncululus</i> , <i>Packera bernardina</i> , <i>Castilleja cinerea</i> , <i>Chrysothamnus naseosus</i> , <i>Potentilla anserina</i> , <i>Astragalus lentiginosus</i> var. <i>sierrae</i> , <i>Sidalcea pedata</i> . 8 populations mapped as 4 polygons. Development of horse ranch has eliminated habitat. N part of population has been extirpated (Krantz, et.al. draft 2000). PVT/SBNF. Survey in 2000 indicates FS occurrence north of housing development is robust. It co-occurs on private land where it is affected by heavy horse grazing and OHV use. Gates on private land boundary provide access to NFS land occurrence where an unclassified trail along fence edge used for foot, equestrian, off highway vehicle and mountain bike affects FS occurrence.	SBD

7	U	1982	SW shore of Baldwin Lake, S of Pan Hot Springs. Meadow w/ high densities of <i>Poa atropurpurea</i> , <i>Packera bernardina</i> , <i>Sidalcea pedata</i> . Most heavily used area on Baldwin Lake for waterfowl nesting. Grazing is a threat. City of Big Bear.	SBD
8	U	1979	Margin of Big Bear Lake at E end on S side, W of Big Bear City from forest to lake margin. Associated w/ <i>Pinus jeffreyi</i> , <i>Juniperus occidentalis australis</i> , <i>Castilleja cinerea</i> . PVT.	SBD
9	0	1937	Near Big Bear Post Office, near mouth of Pine Knot drainage. Convention center built here. Area entirely developed. Extirpated.	SBD
10	U 500-75,000	1980 2003	Upper Holcomb Valley. N of FR 3N16, E of crossing at Caribou Creek, W of log cabin. ORVs could threaten. At edges of seeps in open <i>Artemisia tridentata</i> meadow on clay soil w/ cobbles. w/ <i>Packera bernardina</i> , <i>Perideridia parishii</i> . Also w/ wet meadow/pebble plain communities. SBNF. Additional fencing and interpretive signing installed in 2001 to protect habitat. Monitoring and fence repair occur frequently.	SBD

11	0	1939	Bear Valley, Golf Course (Moonridge Meadows), San Bernardino Mtns. Site is now a turf golf course. Extirpated.	SBD
24630 (UCR)	U	1979	Eagle Point, immediately N of Oriole and Swan Dr., residential development only 50m away, annually wet from spring nearby. T2N/R1E/S20 (Krantz/UCR)	SBD

- *U = Unknown*
- ** = an occurrence number has not been assigned*
- *SBNF = San Bernardino National Forest*
- *SBD = San Bernardino County*

Threats

Meadows on National Forest System lands face a variety of threats. At the Belleville Meadow occurrence, prospecting, digging, dry washing, and unclassified trail use through the meadow are factors affecting *Thelypodium stenopetalum*. At the South Baldwin Lake occurrence, an unclassified trail originating from the adjacent private land that is used for hiking, horseback riding, mountain biking, and off highway vehicle use affects the *Thelypodium stenopetalum* occurrence (USDA Forest Service 2000).

The communities in Big Bear Valley are expected to experience increased growth through the next couple of decades. Approximately 69% of the known occurrences of *Thelypodium stenopetalum* are on private lands and are consequently without protection under the federal Endangered Species Act. Increased urban development will continue to add to the pressures on the few remaining areas of private lands with known occurrences or potential habitat.

Approximately 8% (8.6 acres [3.5 hectares]) of the known occurrences of *Thelypodium stenopetalum* are under claim. Belleville Meadow is a popular prospecting site and several gold claims overlap the *Thelypodium stenopetalum* occurrence. Effects to occupied habitat under claim do not occur at this time, and a site specific analysis would be completed prior to approval of a Plan of Operation, however effects from prospecting do occur. Direct impacts may result from ground-disturbing activities (*e.g.*, digging, sluicing, panning, storing/piling soil). Indirect impacts may occur as hydrological features of the landscape are changed (USDA Forest Service 2000).

Thelypodium stenopetalum is associated with vernal wet alkaline clay soils. This habitat association dictates that the viability of a population is dependent on the continuation of the water supply that feeds the springs and seeps. Consequently, this species' habitat may be dependent upon upstream water uses.

The USDA Forest Service has identified activities that alter the hydrological function of meadow habitat for *Thelypodium stenopetalum* (USDA Forest Service 2000). Specific activities include forest roads and trails, dispersed recreation and, to a lesser extent, recreation special uses.

On private lands, *Thelypodium stenopetalum* is seriously affected by grazing, vehicles, and urbanization (California Native Plant Society 2001).

Conservation and Management Considerations

A recovery plan for *Thelypodium stenopetalum* was approved in July 1998 (U.S. Fish and Wildlife Service 1998). The recovery plan identifies criteria for downlisting *Thelypodium stenopetalum* and recovery tasks that could include San Bernardino National Forest management or cooperation and/or National Forest System lands.

The following list of conservation practices should be considered for *Thelypodium stenopetalum*:

- Continue implementation of the 1998 recovery plan for *Thelypodium stenopetalum*, and the revised Recovery Plan when completed.
- Implement actions in the SBNF Meadow Habitat Management Guide.
- Continue to monitor fence lines and signing that protects populations and reconstruct in a timely manner as necessary. Work with adjacent landowners to reduce effects of unclassified trail use on NFS lands.
- Survey all new occurrences of *Thelypodium stenopetalum* and any occurrences that have not been visited in the past ten years, and record occurrence status, habitat condition, and threats.
- Apply the habitat suitability criteria and detection protocol developed for this taxon to surveys at the project level.
- Collect a herbarium voucher specimen of *Thelypodium stenopetalum* to document new occurrences or to verify a historical occurrence if the occurrence is not known to have been documented in at least ten years prior.
- Map known and new occurrences of *Thelypodium stenopetalum* in the area using NRIS data collection standards, and incorporate these occurrences into the Sensitive Plant Atlas.

Evaluation of Current Situation and Threats on National Forest System Lands

Thelypodium stenopetalum is considered to have high vulnerability on National Forest System lands (Stephenson and Calcarone 1999) because it 1) is endemic to the Big Bear Valley area, 2) is restricted to montane meadows, a rare habitat type, 3) is present within mining claims, 4) is present within a high use recreation area, 5) is affected by unclassified trail use and 6) is affected by changes in hydrological regimes. The primary threats to this species on NFS lands are user created trails and associated use occurring adjacent to private land and actions that would alter hydrological regimes including the potential for prospecting.

The installation of fencing and interpretive signing and the restoration of an unclassified trail in 2001 have succeeded in providing additional protection to the Belleville Meadow occurrence. An attempt has been made to reduce unclassified trail use off the private property on to NFS lands at the South Baldwin Lake occurrence in 2002 by installing signing. Monitoring of all protection measures occurs at high frequency and repairs are completed in timely manner. Implementation of strategies listed in the Meadow Habitat Management Guide completed on the San Bernardino National Forest in 2002 will provide continual protection for this species (USDA Forest Service 2002). Both occurrences on NFS lands have a large number of individual plants and the trend for this species appears to be stable. There is a possibility that future mining could affect the Belleville occurrence, however the probability is low. Habitat degradation caused by unclassified trail use and changes to hydrological regimes appear to be the largest threats at this time. The USDA Forest Service has identified activities that alter the hydrological function of meadow habitat for *Thelypodium stenopetalum* (USDA Forest Service 2000). Specific activities include forest roads and trails, dispersed recreation and, to a lesser extent, recreation special uses.

Based upon the above analysis this species has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System Lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	A	B	B	C	A

Thelypodium stenopetalum is listed under the Endangered Species Act of 1973, as amended, as endangered, which assures that any new project proposed in or near its habitat will undergo considerable analysis and be subject to consultation with the USFWS at the site-specific level.

The viability of this species is primarily tied to protection and management of meadow habitat. To provide for viability and recovery of this species, some of the most important habitat for this species must be clearly and substantially protected. With implementation of the USFWS Recovery Plan and the SBNF Meadow Habitat Management Guide, viability for this species on NFS lands is secure.

Consideration of the suitable use restricting motorized and mechanized vehicle travel to designated forest transportation system roads and trails, along with Standards associated with Special Interest Areas, dispersed recreation, special uses that relate to water extraction, riparian areas and mining factor

in to the outcomes. Implementation of actions listed in the Recovery Plan and in the SBNF Meadow Habitat Management Guide also factor in to this outcome as do the emphasis of the alternatives as described below.

Under Alternative 1, current management would be retained; because this taxon is a listed species, it would continue to benefit from the high level of habitat protection and monitoring under the Southern California Conservation Strategy. In this alternative, however the South Baldwin Lake occurrence would not be zoned as a Critical Biological zone, reducing potential for long term protection of this occurrence. The Belleville Meadow population would continue to be zoned as Back Country in all alternatives. The South Baldwin Lake occurrence would be managed within the South Baldwin Lake Critical Biological zone in Alternatives 2, 3, 4, 4a and 6 adding increased protection to 10 of the 38 acres of occupied habitat on NFS lands. Both the Belleville Meadow and the South Baldwin Lake occurrences would continue to be managed within the existing Holcomb Valley/North Baldwin Lake Special Interest Area under all alternatives. Under Alternatives 2-6, use of Standard S33 would provide additional protection to the rare plants in this SIA when new projects are proposed. All alternatives prioritize invasive nonnative species removal in threatened and endangered species and riparian habitat. This would benefit the South Baldwin Lake occurrence where *Tamarix rasissimosa* is present.

In Alternative 2, there is a higher level of investment in avoidance and minimization of effects to species-at-risk but provides little focus on the restoration of habitats. More intensive user controls would be designed to minimize user conflicts with sensitive environmental resources. Under Alternative 3, there is a higher level of investment in proactive habitat improvement and surveys, and a stronger focus on habitat restoration compared to avoidance of habitat degradation. There is a higher level of investment in maximum visitor capacity controls and modification of existing facilities including a decommissioning of recreation facilities and individual sites that are affecting sensitive resources. Alternative 4 would provide the most emphasis on all types of recreation. In this alternative, there is a higher level of focus on management of recreation growth including monitoring recreation use and its effects and managing use in order to offset effects of uses on other resources such as wildlife and vegetation, emphasizing enforcement, and public education programs.

The difference between Alternative 4 and Alternative 4a is that 4a would not accommodate as much as the projected recreation demand as in Alternative 4 and there would be a higher emphasis on management of dispersed recreation. Sustaining the setting in Alternative 4a instead of the sustaining the recreational resource as in Alternative 4 would be expected to benefit habitat over the long term.

Alternative 5 is designed to fully accommodate the projected demand for motorized recreation use, which may increase incidents of unauthorized off-route vehicle travel increasing the risk that portions of the populations could be damaged. The South Baldwin Lake Critical Biological zone is not recommended in this alternative, reducing potential for long term management of ten acres of occupied habitat. In Alternative 6, there is a higher level of emphasis on Alternative 6 in low impact recreation, visitor capacity controls, public education and habitat restoration. Recovery of this species is expected to occur sooner under Alternatives 3 and 6 due to the emphasis on protecting ecological integrity.

Viability Outcomes for All Lands within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
D	D	D	D	D	D	D

Thelypodium stenopetalum is a locally endemic species restricted to meadow habitat in Big Bear and Holcomb Valley; only 6-8 occurrences are extant. It is listed as endangered by the state of California offering some protection on private land. Two occurrences are protected on state and city land, two occurrences are protected on NFS lands and the remaining occur on private lands. Occurrences on private lands are degraded by horse grazing, vehicle use, and urbanization (California Native Plant Society 2001). As private land development increases, the demand for water and new diversions/ extractions increases. This in turn increases the potential for changes in hydrological regimes that could affect wet meadow habitat. Maintenance of populations on NFS lands will contribute to recovery of this taxon; however conditions and situations related to development of private lands are expected to result in the loss of some occurrences over time.

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Tetracoccus dioicus

**Thelypteris puberula var.
sonorensis**

Thelypteris puberula var. sonorensis

Thelypteris puberula (Baker) C. Morton var. *sonorensis* A.R. Smith (Sonoran maiden fern)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G5T3T4 S2.2? - threatened? (California Natural Diversity Database)

California Native Plant Society (2001): List 2; R-E-D Code 2-2-1

General Distribution

Thelypteris puberula var. *sonorensis* occurs at scattered coastal and desert area locations in Los Angeles, Riverside, San Bernardino, and Santa Barbara counties (California Native Plant Society 2001). The species is more common outside of California, where it ranges from Arizona south into Baja California and Sonora, Mexico. The California Natural Diversity Database (2004) contains records for 13 occurrences.

Distribution in the Planning Area

Thelypteris puberula var. *sonorensis* occurs on or adjacent to the Los Padres, Angeles, and San Bernardino National Forests. Smith (1976) listed six canyons where this fern occurs on or near the Los Padres National Forest, including Bartlett, Mission, and Romero Canyons. Collections at Monrovia Canyon, Roberts Canyon, and Santa Anita Canyon in the south foothills of the San Gabriel Mountains are on or adjacent to the Angeles National Forest. The taxon was collected at Little Sand Canyon on the south slope of the San Bernardino Mountains on the San Bernardino National Forest; it is also known from the canyons near Palm Springs (CalFlora 2000, California Natural Diversity Database 2004). Krantz and others (draft 2002) state this taxon "occurs in the San Gabriel Mountains and to the south.". White (draft 2003) states it "occurs at the east base of San Jacinto Mountains according to Munz".

Taxonomy and Natural History

Thelypteris puberula var. *sonorensis* is a fern in the thelypteris family (*Thelypteridaceae*).

Thelypteris puberula var. *sonorensis* is a perennial rhizomatous herb that produces spores January-September (California Native Plant Society 2001).

Habitat Description

Thelypteris puberula var. *sonorensis* grows in meadows, seeps, and along streams in foothill canyons to around 2,000 feet (610 meters) (California Native Plant Society 2001).

Occurrence Status

Thelypteris puberula var. *sonorensis* population trends on National Forest System lands are unknown (Stephenson and Calcarone 1999). Most occurrences have not been relocated since the original collections. The Hemlock Fire occurred in 1997 at the Little Sand Canyon location, but it is unknown whether the fire and subsequent flooding and erosion affected this occurrence (Stephenson and Calcarone 1999).

Threats

No threats have been identified for occurrence of *Thelypteris puberula* var. *sonorensis* that are found on National Forest System lands. Plants found in meadow habitats may be prone to impacts from foot traffic and other forms of dispersed recreation. Plants found on rocky cliffs and side slopes are expected to be less susceptible to impacts from dispersed recreation.

Conservation and Management Considerations

Acquire information regarding *Thelypteris puberula* var. *sonorensis* occurrences on National Forest System lands to determine population trends and potential threats. Implement actions to protect as necessary.

Evaluation of Current Situation and Threats on National Forest System Lands

Thelypteris puberula var. *sonorensis* has a distribution that is peripheral to National Forest System lands, with most occurrences being found just off of National Forest System lands in lower elevation foothills or desert canyons. On the San Bernardino National Forest, this taxon is included in the Meadow Habitat Management Guide and will benefit from conservation actions recommended in the guide (USDA Forest Service 2002). Riparian conservation management will benefit this taxon on all NFS lands where it occurs.

Based upon the above analysis *Thelypteris puberula* var. *sonorensis* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Thelypteris puberula var. *sonorensis* is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Thelypteris puberula* var. *sonorensis* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Thelypteris puberula* var. *sonorensis* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Thelypteris puberula* var. *sonorensis* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Thelypodium stenopetalum

**Thermopsis californica var.
semota**

Thermopsis californica var. semota

Thermopsis californica Wats. var. *semota* (Jeps.) Chen & Turner (Velvety false lupine)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4T2, S3.3 (California Natural Diversity Database 2003)

California Native Plant Society (2001): List 1B R-E-D Code 2-2-3

General Distribution

Thermopsis californica var. *semota*, velvety false lupine, is endemic to the Palomar and Laguna Mountains in San Diego County.

Distribution in the Planning Area

Within the National Forest System lands, *Thermopsis californica* var. *semota* occurs in the Descanso and Palomar Ranger Districts on the Cleveland National Forest (California Department of Fish and Game 2002).

Taxonomy and Natural History

Thermopsis californica var. *semota* is a perennial rhizomatous herb in the pea family (Fabaceae) that blooms March-June (California Native Plant Society 2001). Isley (1993) describes velvety false lupine as *Thermopsis macrophylla* var. *semota*, but most of what was recognized as *T. macrophylla*, including varieties *argentata*, *semota*, and *venosa*, has been determined to belong to a separate species, *T. californica* (Chen and others 1994). *Thermopsis californica* var. *semota* is one of four varieties of *Thermopsis californica* native to California. *Thermopsis californica* var. *semota* has a more southern distribution and is restricted to San Diego County, while *T. californica* var. *argentata*, *T. californica* var. *macrophylla*, and *T. californica* var. *venosa* have more northern distributions in California (Isley 1993).

Habitat Description

Thermopsis californica var. *semota* occurs primarily on the edges or within openings of lower montane conifer forests and in meadows and other areas with vernal moist soils (e.g., Cuyamaca Lake, Laguna Meadow). Many occurrences are reported in openings, on rocky slopes, and on outcrops within forests dominated by jeffrey pine (*Pinus jeffreyi*), black oak (*Quercus kelloggii*), sugar pine (*P. lambertiana*), and white fir (*Abies concolor*). The elevation range for *Thermopsis californica* var. *semota* is 3,400-6,100 feet (1,030-1,870 meters). The taxon has been found in lesser abundance in grasslands and sandy scrub habitats (Stephenson and Calcarone 1999; California Native Plant Society 2001; California Department of Fish and Game 2002).

Occurrence Status

This taxon is currently known from approximately 50 occurrences (Stephenson and Calcarone 1999; California Department of Fish and Game 2002). More than 30 documented populations are present on the Cleveland National Forest (Winter pers. comm.), many of which recorded in the Mount Laguna Recreation Area. Most populations consist of 100–500 plants, and some populations have several thousand plants (Winter pers. comm.).

OCCURRENCE DATA of *Thermopsis californica* var. *semota* (Velvety False Lupine)

Occurrence No. (CNDDDB)	CNF Record #	No. of Plants	Year Reported	Location/Land Owner	County
1	2-1	500 +	1990	S of Water-of-the-Woods Lake / CNF	SD
*	2-2	U	U	Laguna Meadow / CNF	SD
*	2-3	U	U	Monument Peak / CNF	SD
*	2-4	U	U	Monument Peak / CNF	SD
*	2-5	U	U	Cuyamaca Peak / CNF	SD
*	2-6	U	U	Boulder Creek Road / BIA, private	SD
*	2-7	U	U	Santa Ysabel / private	SD

*	2-8	U	U	Julian / private	SD
15	2-9	U	U	Simpson Ranch (Palomar) / CNF	SD
15	2-10	U	U	Mesa Grande / CNF	SD
5	2-11	51 – 100	1984	Mt. Laguna Recreation Area / CNF	SD
10	2-12	51 – 100	1984	Laguna Meadow / CNF	SD
12	2-13	5 – 10	1985	NE of Big Laguna Lake / CNF	SD
6	2-14	1001 – 10,000	1986	Filaree Flat Road / CNF	SD
3	2-15	100	1987	E of Morris Ranch / CNF	SD
7	2-16	1000	1988	Laguna Campground / CNF	SD
13	2-17	1000 +	1988	Garnet Peak / CNF	SD
7	2-18	1001 – 10,000	1985	Laguna Campground / CNF	SD
9	2-19	51 – 100	1984	Laguna Campground / CNF	SD
10	2-20	100	1989	NW of Water-of-the- Woods Lake / CNF	SD
10	2-21	10	1989	NW of Water-of-the- Woods Lake / CNF	SD
4	2-22	375	1989	El Centro Ravine / CNF	SD

8	2-23	500	1989	Flathead Flats / CNF	SD
11	2-24	2000	1989	Boiling Spring Ravine / CNF	SD
14	2-25	120	1990	Al-Bahr Shrine Camp / CNF	SD
1	2-26	1000	1989	S of Water-of-the-Woods Lake / CNF	SD
1	2-27	1000	1988	Wooded Hill / CNF	SD
*	2-28	U	U	FS Road 14S02 / CNF	SD
*	2-29	1000	1991	SE of Big Laguna Lake / CNF	SD
*	2-30	75	1995	Los Heucos Road / CNF	SD
*	2-31	500	1995	N of Gem Hill / CNF	SD
*	2-32	2,500	2002	Mesa Grande / CNF	SD

- U = Unknown
- * an occurrence number has not been assigned
- CNF = Cleveland National Forest
- SD = San Diego County

Threats

Thermopsis californica var. *semota* occurrences in the Cleveland National Forest have potential for impacts associated with recreation (e.g. camping, hiking, horseback riding), competition with nonnative species, population division by paved and dirt roads, vehicle traffic, and livestock grazing. A few occurrences recorded on National Forest land are located adjacent to or are bisected by Sunrise Highway and Filaree Flat Road, where in 1986 2-15 individuals were observed growing in the dirt road bed. Heavy recreation use and grazing pressures pose threats to populations located in or near Laguna Meadow, Laguna Campground, and the lakes of Laguna Meadow. Although grazing may impact *Thermopsis californica* var. *semota* populations in the Cleveland National Forest, observations suggest

this perennial herb is not heavily browsed by livestock. Where recreation may threaten *Thermopsis californica* var. *semota* populations, measures have been implemented to minimize associated impacts (e.g. barrier construction, trail re-routing).

Conservation and Management Considerations

As some *Thermopsis californica* var. *semota* populations are found on road margins, the species appears tolerant of mild disturbances. Although this species is not susceptible to heavy grazing and measures have been taken to protect known occurrences on National Forest land, trampling can occur from livestock use, and heavy recreational use and unauthorized off road driving use can also affect plants (Reiser 1994, USDA Forest Service 1998, California Native Plant Society 2001, California Department of Fish and Game 2002).

The following is a list of conservation practices that should be considered for *Thermopsis californica* var. *semota*:

- Monitor known populations in areas where recreation use and livestock grazing occur. Protect habitat as necessary.

Evaluation of Current Situation and Threats for National Forest System Lands

Thermopsis californica var. *semota* is endemic to the southern Peninsular Ranges, but it can be locally abundant where it occurs. Some populations on the Cleveland National Forest are subject to recreation impacts and grazing pressure in the Laguna Mountains Recreation Area. However, cattle apparently do not seek out this plant, and populations are resilient enough that private landowners with populations of this taxon on their property sometimes seek help in controlling it. Fences have been constructed around some occurrences of *Thermopsis californica* var. *semota* in Laguna Meadow to reduce trampling of the plants by cattle and people, and trails have been rerouted. In Laguna Campground, removal and rehabilitation of two campsites that included fencing and interpretive signing have protected habitat from trampling. This taxon does not seem to be substantially threatened by ongoing Forest Service activities at this time.

Based upon the above analysis this species has been assigned the following threat category:

4. Uncommon and narrow endemic in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Thermopsis californica var. *semota* is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Thermopsis californica* var. *semota* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Thermopsis californica* var. *semota* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Personal Communication

Winter, Kirsten. Forest Biologist, USDA Forest Service, Cleveland National Forest. June 19, 2002.
Comment submitted to the USDA Forest Service Southern Province Forest Plan Revision species
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***Thelypteris puberula* var.
*sonorensis***

Thermopsis macrophylla

Thermopsis macrophylla

Thermopsis macrophylla H. & A. (Santa Ynez false-lupine)

Management Status

Federal: Forest Service Sensitive; Bureau of Land Management Sensitive

California: Rare

Heritage Rank: G1 S1.3 – very threatened (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Thermopsis macrophylla is known from fewer than 15 occurrences in the Santa Ynez Mountains of Santa Barbara County, from La Cumbre Peak to about two miles west of Santa Ynez Peak (CalFlora 2002, California Natural Diversity Database 2004, California Native Plant Society 2001).

Distribution in the Planning Area

All ten occurrences of *Thermopsis macrophylla* that have been mapped are on the Santa Barbara Ranger District of the Los Padres National Forest. They range from Santa Ynez Peak east to Camino Cielo Road and La Cumbre Peak (Stephenson and Calcarone 1999). An occurrence reported from Big Pine Mountain needs to be field checked and verified.

Taxonomy and Natural History

Thermopsis macrophylla is a dicot in the legume family (Fabaceae). The genus *Thermopsis* underwent a taxonomic revision subsequent to the treatment published in *The Jepson Manual* (Isely 1993). Confusion over the taxonomic identity of *T. macrophylla* led Howell (1957) to describe what he believed to be a new taxon, *T. macrophylla* var. *agnina*, which was designated as rare by the California Department of Fish and Game. However, most of what was recognized in *The Jepson Manual* (Isley 1993) as *T. macrophylla*, including varieties *argentata*, *semota*, and *venosa*, has been determined to belong to a separate species, *T. californica* (Chen and others 1994). Variety *agnina* was based on plants that are now known to be typical *T. macrophylla* (Chen and others 1994). *Thermopsis macrophylla* is similar to *T.*

californica but is much more robust.

Thermopsis macrophylla is a perennial rhizomatous herb that blooms April-June (California Native Plant Society 2001). Its demographic characteristics resemble those of chamise (*Adenostoma fasciculatum*) in that it resprouts after fire and establishes large numbers of seedlings from the germination of heat-stimulated seeds (Borchert 1989). Wildfire can stimulate the germination of seeds and reduce chaparral stand densities, creating conditions for the growth and establishment of new plants.

Habitat Description

Thermopsis macrophylla grows on shallow, gravelly sandy loams derived from Matilija sandstone (Borchert 1989). Some occurrences are found in disturbed areas such as fuel breaks (California Natural Diversity Database 2004).

Occurrence Status

Thermopsis macrophylla has a highly restricted distribution in California but is not currently considered to be at risk of extinction (California Native Plant Society 2001). Population trends of *Thermopsis macrophylla* on National Forest System lands are unknown, but vulnerability appears to be low (Stephenson and Calcarone 1999). Borchert (1989) reported that there were several thousand plants in one study population spread out over two hectares and about 700 individuals spread out over 0.5 hectares in a second nearby occurrence (both of these sites are just northwest of Santa Ynez Peak). The population trends are difficult to assess due to the species' life history traits, i.e., stands typically exhibit a decreasing trend, being locally abundant after wildfire, and decreasing in numbers thereafter.

OCCURRENCE DATA – *Thermopsis macrophylla* (Santa Ynez false Lupine)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
1	AREA BURNED IN 1955 AND 1980. 200 PLANTS SEEN IN WESTERNMOST POLYGON AND 300 IN EASTERNMOST POLYGON IN 1999 BY WILKEN. HE SAW NO SEEDLINGS IN 1999.	1999	1-2 MI W OF SANTA YNEZ PK ALONG CAMINO CIELO RD. (ALSO INCL. SEC. 11.) THREE POLYGONS MAPPED ALONG ROAD THROUGH THE MIDDLE OF SECTIONS 10 AND 11.	SB

2	SMALL COLONY. SEEDING VOGOROUSLY AFTER 1955 BURN.	1980	W SLOPE SANTA YNEZ PK, SANTA INEZ MTNS, ALONG CAMINO CIELO. IN AREA OF REFUGIO PASS.	SB
3	U	1940's	ALONG JEEP TRAIL IN HILTON CYN, APPROX 2 MI TO N OF SANTA YNEZ PK, SANTA INEZ MTNS.	SB
4	U	1940's	ABOUT CAMP DRAKE WOODLAND (NOW A GIRL SCOUT CAMP), ON N SIDE IN TEQUEPIS CYN.	SB
5	U	1962	S SLOPE SANTA INEZ PK, SANTA INEZ MTNS.	SB
8	SEEN IN 1955. BORCHERT IS CERTAIN THAT THERE ARE NO PLANTS AT THIS SITE.	1955	JUNCTION OF CAMINO CIELO ROAD AND ROAD TO LA CUMBRE LOOKOUT, SHORT DEADEND ON RIDGE, SANTA YNEZ MOUNTAINS.	SB

9	SPECIES NOTED AS ABUNDANT WHEN COLLECTED IN 1963.	1963	10.2 MILES WEST OF HWY 154 (NOW = HWY 150) ON CAMINO CIELO, SANTA YNEZ MOUNTAINS. MAPPED ALONG WEST CAMINO CIELO TO THE EAST OF BROADCAST PEAK AT ABOUT 3400 FT.	SB
10	WILKEN CHECKED THIS OCCURRENCE OVER A FOUR YEAR PERIOD (PRIOR TO 2000) AND SAW NO PLANTS.	1959	6 MILES PAST KINEVAN CANYON ON CAMINO CIELO, SANTA YNEZ MOUNTAINS. MAPPED ALONG WEST CAMINO CIELO NORTH OF ELLWOOD CANYON AT AROUND 2600 FT.	SB

- *U* = Unknown
- * = an occurrence number has not been assigned
- SB = Santa Barbara

Threats

Road use, road maintenance, and dispersed recreation uses may affect some plants from time to time. There are no fences or barriers constructed around known occurrences. Plants may also be affected by fire suppression and invasive nonnative plants. Fire suppression can directly impact *Thermopsis macrophylla* through the removal of plants by dozers and hand tools. At this time, it does not appear that fire suppression has resulted in reduced fire frequencies for the area occupied by this species. Road maintenance, if not properly coordinated, can result in impacts from blading of plant material and incidental widening of maintained roads. Road maintenance practices can also alleviate noxious weed concerns or contribute to them depending on the manner in which the maintenance is conducted. Yellow star-thistle and fennel are two non-native species that threaten the vigor of *Thermopsis macrophylla* populations by occupying similar habitats.

Conservation and Management Considerations

- *Thermopsis macrophylla* is locally abundant after wildfires, gradually decreasing in abundance until the next fire; it is, therefore, sensitive to fire suppression.
- Management of this species should focus on measures that increase survivorship of recruits and resprouts. This species does not seem to produce sufficient numbers of seeds between fires to perpetuate itself. A 6- to 10-year fire interval is suggested to enable recruits to resprout in an environment of reduced competition from shrubs.
- To evaluate long-term population trends, monitoring could be carried out over the course of several fire cycles for at least 60 years. Experimental studies should investigate fire intensity as well as frequency to gain a better understanding of the population biology of this species (Borchert 1989).
- Known locations are protected from Forest Service project work that would adversely impact the species. The Camino Cielo Defensible Fuel Profile Zone project is currently in the implementation phase, and part of the project's purpose is to treat fuels in some of the areas occupied by *Thermopsis macrophylla*. The project will enhance the habitat of this taxon and provide opportunities for recruitment. The Los Padres National Forest is working with the Santa Barbara Botanic Garden to collect seeds for storage and increase. Plants grown at the Garden may be used to augment the existing populations if the need arises.

Evaluation of Current Situation and Threats on National Forest System Lands

Thermopsis macrophylla is a very narrow endemic, known only from the Santa Ynez Mountains at about 10 locations. Occurrences of *Thermopsis macrophylla* are threatened by off road travel, road maintenance, and invasive non-native plants.

Based upon the above analysis *Thermopsis macrophylla* has been assigned the following threat category:

5. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with substantial threats to persistence or distribution from Forest Service activities.

Viability Outcomes for National Forest System lands

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

Thermopsis macrophylla is a USDA Region 5 Forest Service Sensitive species. This assures that any new project proposed in or near its habitat must undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

Habitat for *Thermopsis macrophylla* has been degraded by road and fuelbreak construction and by the introduction and spread of invasive nonnative plants. Under all alternatives, the area where *Thermopsis macrophylla* occurs would be within the Back Country land use zone. Habitat conditions are stable or are stabilizing, but gaps in the species historic range would remain under all alternatives. Under Alternative 5, the combination of increased emphasis on fuels management (all alternatives) combined with increased emphasis on motor vehicle based recreation would create conditions that might further degrade habitat for *Thermopsis macrophylla*. Increased emphasis on dispersed recreation and motorized use would lead to increased effects from road and trail construction and maintenance, and road effects. It would also increase the level of unauthorized off road travel and increased opportunities for habitat to be damaged and for weeds to be introduced.

Viability Outcomes for All Lands Within Range of the Taxon

Predicted Outcomes by Alternative

1	2	3	4	4a	5	6
B	B	B	B	B	C	B

All of the known occurrences of *Thermopsis macrophylla* are on National Forest System land. Therefore, the predicted outcomes for all lands do not vary from the predicted outcomes for National Forest System lands.

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**Thermopsis californica var.
semota**

Triteleia ixiodes ssp. cookii

Triteleia ixiodes* ssp. *cookii

Triteleia ixioides (Wats.) Green ssp. *cookii* (Hoover) Lenz (Cook's *Triteleia*)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G5T2, S2.3 – no current threats known (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 2-1-3

General Distribution

Triteleia ixioides ssp. *cookii* is endemic to Monterey and San Luis Obispo counties (California Native Plant Society 2001) although Matthews (1997) does not include this taxon in her flora. According to Hoover (1970) *Triteleia ixioides* ssp. *cookii* is "known only in a small area of the Santa Lucia Range from near Cypress Mt. to Pine Mt." Recent fieldwork has resulted in the detection of *Triteleia ixioides* ssp. *cookii* on Fort Hunter Liggett (Painter 2004).

Distribution in the Planning Area

Triteleia ixioides ssp. *cookii* is reported to occur on the Los Padres National Forest in the San Carpoforo Creek watershed in the area near the San Carpoforo Campground (Yadon 1998, Painter 2004). The presence of known occurrences to the south and east of the Monterey Ranger District suggests that potential habitat for *Triteleia ixioides* ssp. *cookii* may exist elsewhere on the southern half of the ranger district.

Taxonomy and Natural History

Triteleia ixioides ssp. *cookii* is a monocot in the lily family (Liliaceae) and is separated from its congeners by its white to pale straw-colored perianth with reflexed lobes, its long pedicels, and a green ovary (Keator 1993). *Triteleia ixioides* ssp. *cookii* is one of five subspecies in *Triteleia ixioides*.

Triteleia ixioides ssp. *cookii* is a cormous perennial herb that flowers in May and June (California Native

Plant Society 2001).

Habitat Description

Triteleia ixioides ssp. *cookii* grows in closed-cone coniferous forest (i.e., near stands of *Cupressus sargentii*) and cismontane woodland on serpentine seeps, in wet ravines, and on streamsides (Utech 2002). The elevation range for *Triteleia ixioides* ssp. *cookii* is 500 to 1,640 feet (150-500 meters) (California Native Plant Society 2001).

Occurrence Status

There are no population records available for *Triteleia ixioides* ssp. *cookii*.

Threats

Although *Triteleia ixioides* ssp. *cookii* is distributed in a limited number of occurrences it is not considered endangered at this time (California Native Plant Society 2001). The area around San Carpoforo Campground is in designated Wilderness and this designation would not change under any of the proposed alternatives.

Conservation and Management Considerations

More information is needed on the occurrence of *Triteleia ixioides* ssp. *cookii* found in the San Carpoforo watershed and additional surveys are needed to determine if *Triteleia ixioides* ssp. *cookii* occurs elsewhere on the Los Padres National Forest

Evaluation of Current Situation and Threats on National Forest System Lands

Triteleia ixioides ssp. *cookii* is a narrow endemic, apparently restricted to a small portion of the Santa Lucia Range, mostly on private property that is peripheral to National Forest System lands. *Triteleia ixioides* ssp. *cookii* is reported to occur on the Los Padres National Forest in the San Carpoforo Creek watershed in the area near the San Carpoforo Campground. The area around San Carpoforo Campground is in designated Wilderness and this designation would not change under any of the proposed alternatives.

Based upon the above analysis *Triteleia ixioides* ssp. *cookii* has been assigned the following threat category:

4. Uncommon, narrow endemic, disjunct, or peripheral in the Plan area with no substantial threats to persistence or distribution from Forest Service activities.

Viability Outcome for National Forest System Lands

Variations in land use designations would not alter the current situation and the various emphases of the alternatives would not result in a substantial change in conditions for this taxon. *Triteleia ixioides* ssp. *cookii* would remain distributed across its current geographic range on National Forest System lands under all alternatives.

Viability Outcome for all Land within Range of Taxon

By maintaining the current distribution of *Triteleia ixioides* ssp. *cookii* on National Forest System lands, no alternatives are expected to contribute substantial adverse cumulative effects that would cause this taxon to suffer a decline in its overall distribution.

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Thermopsis macrophylla	Tropidocarpum capparideum
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Tropidocarpum capparideum

Tropidocarpum capparideum E. Greene (Caper-fruited Tropidocarpum)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G1 S1.1 – (California Natural Diversity Database 2004)

California Native Plant Society (2004): List 1B; R-E-D Code 3-2-3/3-3-3

General Distribution

Tropidocarpum capparideum was found in Alameda, Contra Costa, Glenn, Monterey, Santa Clara, and San Joaquin counties but was thought to be extinct (California Native Plant Society 2001) until recently rediscovered at two locations on Fort Hunter Liggett in Monterey County (California Natural Diversity Database 2004).

Distribution in the Planning Area

Tropidocarpum capparideum is not known to occur on the Los Padres National Forest (California Natural Diversity Database 2004, CalFlora 2002) but is suspected to occur on the Monterey Ranger District due to the presence of known occurrences about 5-7 miles east of the forest boundary in habitats similar to those found on the Monterey Ranger District.

Taxonomy and Natural History

Tropidocarpum capparideum is a dicot in the mustard family (Brassicaceae) (Rollins 1993).

Tropidocarpum capparideum is an annual herb that flowers in March and April.

For the record, it has been stated that plants found at Fort Hunter Liggett appeared to have fruit that differed from the published description (California Natural Diversity Database 2004), however E. Painter has provided information that collections from this location were sent to Missouri Botanical Garden and Dr. Ihsan Al-Shehbaz determined the fruit characteristics did not differ from the current circumscription (Painter 2004). More information on this taxon can be obtained from Dr. Dieter Wilken

(Santa Barbara Botanic Garden), Art Hazebrook (Fort Hunter Liggett), Meredith Osborne (California Department of Fish and Game), and Dr. Ihsan Al-Shehbaz, leading specialist on Brassicaceae including *Tropidocarpum* at the Missouri Botanical Garden (Painter 2004).

Habitat Description

Tropidocarpum capparideum habitat is found in valley and foothill grassland and low alkaline hillsides (California Native Plant Society 2001, Matthews 1997) at an elevation of below 1,500 feet (455 meters). On Fort Hunter Liggett the habitat at one location (Osborne et. al.) is described as an open gravelly slope/flat and at the second location as a large swale with moderately alkaline, slowly draining clay soil (California Natural Diversity Database 2004). At both locations non-native herbs dominate the vegetation.

Occurrence Status

The status of *Tropidocarpum capparideum* at Fort Hunter Liggett is not well known but it was reported that 10 plants were in one area that was not extensively searched with another 100 plants at a second location (California Natural Diversity Database 2004).

There are no known populations of *Tropidocarpum capparideum* on Los Padres National Forest.

Threats

Once thought extinct due to lost habitat, *Tropidocarpum capparideum* is potentially affected by military operations and other land disturbing activities that occur in the inner Coast Ranges. Grazing on National Forest System lands on the Monterey Ranger District may affect *Tropidocarpum capparideum* habitat, however this taxon is not known to occur on NFS lands at this time.

Conservation and Management Considerations

More information is needed to determine what areas on the Los Padres National Forest may provide suitable habitat for *Tropidocarpum capparideum*. Once identified, survey locations of potential habitat to determine presence or absence.

Evaluation of Current Situation and Threats on National Forest System Lands

Tropidocarpum capparideum, once thought extinct, may occur on National Forest System lands based on recent discoveries of the species on nearby Fort Hunter Liggett.

Based upon the above analysis *Tropidocarpum capparideum* has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

No populations of *Tropidocarpum capparideum* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Tropidocarpum capparideum*.

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Viola aurea

Viola aurea Kellogg (Golden violet)

Management Status

Federal: Forest Service Watch List

California: None

Heritage Rank: G3G4, S3S2 (California Natural Diversity Database)

California Native Plant Society (2001): List 2 R-E-D Code 2-2-1

General Distribution

Viola aurea, Golden violet, is known primarily from historic occurrences on the east slope of the Sierra Nevada Mountains and the Mohave Desert, although it has been recently reported from Sierra County (California Natural Diversity Database 2004; Little 1993). It also occurs in Nevada, where it may be more common (California Native Plant Society 2001).

Distribution in the Planning Area

Viola aurea is reported to occur in Cajon Pass (California Natural Diversity Database 2004), which is at the west end of the San Gabriel Mountains intersecting the San Bernardino National Forest. Twisselmann (1967) reported it to occur on the east slope of the Tehachapi Mountains southwest to Mount Pinos, and Smith (1998) reports that it possibly occurs at Pine Mountain Ridge, on or adjacent to the Los Padres National Forest. It is also reported from Doane Valley at Palomar Mountain State Park (California Natural Diversity Database 2004), which is adjacent to the Cleveland National Forest.

Taxonomy and Natural History

Viola aurea is a perennial herb in the violet family (Violaceae) that blooms April–June (California Native Plant Society 2001). Munz and Keck (1973) recognized another subspecies, *V. aurea* ssp. *mohavensis* from the western Mojave Desert, which has subsequently been reclassified as a subspecies of *V. purpurea* (Little 1993).

The gray-tomentose stem of *Viola aurea* originates from a woody taproot and is decumbent or

erect. From 6 to 13 cm tall, this Violet species has simple, canescent leaves with a blade base tapered to truncate. Oblong to round basal leaves (1-6) have 40 to 70 mm petioles, 12 to 50 mm blades, are crenate to shallowly and irregularly serrate, and possess an obtuse tip. Cauline petiole 14 to 55 mm long, lanceolate to ovate blade 15 to 37 mm with a generally dentate to serrate margin. Inflorescence peduncle is 30 to 100 mm and generally canescent. Flower petals are yellow. Including spur, lower petals are 8 to 13 mm long and 3 veined dark brown, whereas upper two petals purple or brown outside (Little 1993).

Habitat Description

Viola aurea occurs on dry, sandy slopes east of the Sierra Nevada, within the Mojave Desert, and in western Nevada (Little 1993). It occurs in sandy places within Great Basin sagebrush scrub and pinyon-juniper woodland at elevations of 4,500 and 6,500 feet (1,000–1,800 meters) (Little 1993, California Native Plant Society 2001). On National Forest System lands, *Viola aurea* would be found primarily in desert montane habitats (Stephenson and Calcarone 1999).

Occurrence Status

Viola aurea is not known to occur on National Forest System lands. The known occurrences are near National Forest boundaries, but presence on National Forest System lands has yet to be observed and documented. It is possible that populations exist within the San Bernardino National Forest and on Bureau of Land Management property located in Mojave Desert, on the eastern Sierra Nevada slope, and into the State of Nevada (California Natural Diversity Database 2004; Little 1993).

Threats

Existing populations of *Viola aurea* may be vulnerable to overgrazing, off-highway vehicle (OHV) use, and development (Stephenson and Calcarone 1999, California Native Plant Society 2001). Also, introduction of invasive nonnative species and associated competition for resources may threaten populations near roadways (California Natural Diversity Database 2004). This taxon is not known to occur on NFS lands, therefore no threats have been identified at this time.

Conservation and Management Considerations

Conservation of this species will depend on efforts outside of Forest Service actions. The following is a prioritized list of conservation practices that should be considered for *Viola aurea*:

- Areas within National Forest System lands that have potential suitable habitat and are subject to grazing and OHV use should be surveyed for the species prior to proposed management activities.

Evaluation of Current Situation and Threats on National Forest System Lands

No occurrences of *Viola aurea* are known from National Forest System lands, although potential habitat occurs on the San Bernardino and Cleveland National Forests. Surveys on suitable habitat are recommended to assist in determining vulnerability. No risks to potential desert montane habitats from Forest Service activities have been identified at this time.

Based upon the above analysis this species has been assigned the following threat category:

2. Potential habitat only in the Plan area.

Viability Outcomes

Viola aurea is on the San Bernardino National Forest Watch list. During project surveys, information will be recorded on occurrences of *Viola aurea* to the extent possible. This information will be used to track or "watch" for trends in species abundance and distribution.

No populations of *Viola aurea* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Viola aurea*.

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Tropidocarpum capparideum

Viola pinetorum ssp. grisea

Viola pinetorum ssp. grisea

Viola pinetorum ssp. *grisea* E. Greene (Grey-leaved violet)

Management Status

Federal: Forest Service Sensitive

California: None

Heritage Rank: G4G5T1; S1.3 (California Natural Diversity Database)

California Native Plant Society (2001): List 1B; R-E-D Code 3-1-3

General Distribution

Viola pinetorum ssp. *grisea* is known from approximately 10 occurrences in the southern Sierra Nevada and Tehachapi Mountains (California Native Plant Society 2001, Little 1993, Twisselmann 1967). A single historical occurrence is recorded from Big Bear Valley in San Bernardino County (CalFlora 2002), but this collection may be *Viola pinetorum* ssp. *pinetorum*.

Distribution in the Planning Area

Twisselmann (1967) reported that *Viola pinetorum* ssp. *grisea* ranged as far west as Mount Pinos, which would place the species within or near the Los Padres National Forest. The questionable record from Big Bear Valley is on or near the San Bernardino National Forest. If, as appears likely, the historical occurrence from Big Bear Valley is mis-applied and the report from Mount Pinos is unsubstantiated, this taxon is not known from the area.

Taxonomy and Natural History

Viola pinetorum ssp. *grisea* is a dicotyledon and a member of the violet family (Violaceae). It belongs to a group of species that is highly variable and in need of further study. As currently recognized, *Viola pinetorum* ssp. *grisea* includes southern Sierran and Tehachapi populations formerly placed in *V. purpurea* ssp. *xerophyta* (Munz 1974; Little 1993). *Viola pinetorum* ssp. *pinetorum*, which is occasional in the western Transverse Ranges, San Bernardino and San Jacinto mountains (including Mt. Pinos and Big Bear Valley) was also formerly *V. purpurea* ssp. *xerophyta*, in part (Little 1993). Reported historical occurrences of *Viola pinetorum* ssp. *grisea* from the San Jacinto and San Bernardino

Mountains (USDA Forest Service 2003) could well be populations of *V. purpurea* ssp. *xerophyta* that have been reassigned to *V. pinetorum* ssp. *pinetorum*.

Viola pinetorum ssp. *grisea* is a perennial herb that blooms between April and July (California Native Plant Society 2001). The stems are prostrate to erect from a woody taproot. The leaves are simple, linear to ovate, and generally more or less toothed or wavy margined. The blade base is tapered and the tip is acute. The basal leaves are 4-20 cm, thin or not, and the cauline leaves are 30-150 mm, generally four times the width. The lowest petal, including the spur, is 5-11 mm. The flower is lemon-yellow, and the lower three petals are purple-brown veined. The lateral two petals are bearded. The upper two petals are more or less purple-brown outside. Fruit are 4-7 mm and puberulent. *Viola pinetorum* ssp. *grisea* is differentiated from ssp. *pinetorum* by the following characteristics. *Viola pinetorum* ssp. *grisea* is 4-10 cm and canescent. The leaves are 3-10 mm wide. The basal leaves are 40-95 mm, and the cauline leaves are 30-80 mm. The peduncle is less than 70 mm (Little 1993).

Habitat Description

Viola pinetorum ssp. *grisea* grows in upper montane conifer and subalpine conifer forests, on dry slopes and peaks from 4,900 to over 11,000 feet (1,493 to over 3,352 meters) in elevation (Little 1993; California Native Plant Society 2001).

Occurrence Status

There are no known occurrences of this species in the plan area. Much of Bear Valley has been developed since Parish's collection was made in 1886, so even if this collection is properly assigned to *V. p.* ssp. *grisea*, the occurrence may be extirpated.

The following table shows the recorded occurrences in/near the area, the number of plants reported to be present, and the general location of these occurrences.

OCCURRENCE DATA – *Viola pinetorum* ssp. *grisea* (Grey-leaved violet)

Occurrence No. (CNDDDB)	No. of Plants	Year Reported	Location/Land Owner	County
CalFlora 1214638	U	1886	Bear Valley, San Bernardino Mountains. Collected by Parish. Land owner: U.	SBD

- *U* = Unknown
- * = an occurrence number has not been assigned

- *SBD = San Bernardino County*

Threats

Unknown within the planning area.

Conservation and Management Considerations

The following conservation practices should be considered for *Viola pinetorum* ssp. *grisea*:

- Determine the proper taxonomic identity of the 1886 Parish collection. If it is *Viola pinetorum* ssp. *grisea*, attempt to relocate the historic locality.

Evaluation of Current Situation and Threats on National Forest System Lands

Viola pinetorum ssp. *grisea* is not currently known from the plan area. The single historic record is questionable and should be verified.

Based on the above analysis, *Viola pinetorum* ssp. *grisea* has been assigned the following threat category:

2. Potential habitat only in the Plan Area.

Viability Outcomes

Viola pinetorum ssp. *grisea* is a USDA, Region 5 Forest Service, Sensitive Species. This assures that any new project proposed in or near its habitat has to undergo a careful analysis of effects through the development of a biological evaluation at the site-specific level.

No populations of *Viola pinetorum* ssp. *grisea* are known to occur on National Forest System lands, but the taxon should be considered when conducting plant surveys in potential habitat. It is, therefore, not possible to describe the effects of the alternatives without making a host of unsupportable assumptions. Highly speculative analysis of this sort does not provide for a meaningful comparison of alternatives. Any predictions on viability would be similarly uninformative and unreliable. Therefore, no such analysis is presented for *Viola pinetorum* ssp. *grisea*.

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Viola aurea
