Appendix D. Terrestrial Wildlife and Plant Species Supplemental Information

The Forest adopted an ecosystem and species-specific approach, known as a coarse-filter/fine-filter approach, to provide for the diversity of plant and animal communities and the long-term persistence of native species in the plan area. The coarse-filter plan components are designed to maintain or restore ecological conditions for ecosystem integrity and ecosystem diversity in the plan area within Agency authority and the inherent capability of the land. The habitat needs of all plant and animal species are provided by plan components associated with the coarse filter of terrestrial vegetation conditions. Fine filter plan components are also written to specifically provide for the needs of some species due to their status (at-risk) or specific habitat needs that are not covered by the coarse filter.

This appendix provides species lists and information on wildlife and plant species to supplement Chapter 3 of the DEIS, including the habitat associations for each species.

Wildlife Species Habitat Associations

Table 1 lists wildlife species analyzed in the EIS and their habitat associations; it is not an exhaustive list of all the species found on the HLC NF. Habitat associations are groupings of vegetation types as referred to in the Terrestrial Wildlife Diversity section of the DEIS. Some species may use more habitat associations than indicated in Table 1, which is intended only to provide a general overview of terrestrial wildlife diversity on the HLC NF. SCC would be adopted with the action alternatives. Under the No Action alternative, the designations for Regional Forester Sensitive Species (RFSS) would be retained. Management indicator species (MIS) are not identified in the table, but would be included in the no action alternative.

Table 1. HLC NF Wildlife Species Habitat Associations

Species	Species Status	Grass-forb-shrub	Late-successional, old-growth, large trees	Snags	Coarse woody debris	Hard-wood Forest	High Elevation Habitats	Aquatic, Wetland, and/or Riparian	Dry Conifer (Warm-dry PVT)	Mixed Conifer (Warm Dry, Cool Moist, & Cold PVTs)	Cave, Cliff, Rock, other Geologic
Amphibians and Reptiles											
Western toad	RFSS		X					X			
Garter Snake								X	X		
Salamander			X		X	X		X			
Birds											
Bald eagle	RFSS							X			
Barred owl			X	X						X	
Black rosy finch							X				
Black-backed woodpecker	RFSS		X	X							
Boreal Owl			X							X	
Brown Creeper			X	X						X	
Clark's nutcracker							X		X		
Cooper's hawk										X	
Flammulated owl	SCC, RFSS		X	X					X		
Golden eagle											X
Gray-crowned rosy finch							X				
Great gray owls				X						X	
Harlequin duck	RFSS							X			
Hawk Owl				X						X	
Lewis's woodpecker	SCC		X	X		X			X		
Mountain bluebird				X					X		
Northern flickers				X		X		X		X	
Northern goshawk			X							X	
Northern (American) three-toed woodpecker				X						X	

Species	Species Status	Grass-forb-shrub	Late-successional, old-growth, large trees	Snags	Coarse woody debris	Hard-wood Forest	High Elevation Habitats	Aquatic, Wetland, and/or Riparian	Dry Conifer (Warm-dry PVT)	Mixed Conifer (Warm Dry, Cool Moist, & Cold PVTs)	Cave, Cliff, Rock, other Geologic
Nuthatch				X		X		X	X	X	
Peregrine falcon		X									X
Pileated woodpecker			X	X					X	X	
Screech Owl				X		X		X			
Sharp-shinned hawk										X	
Shorebirds and Waterfowl								X			
White-tailed ptarmigan							X				
Mammals											
Long-eared myotis	RFSS			X						X	X
Fringed myotis	RFSS								X	X	X
Silver-haired bat				X							
Townsend's big-eared bat	RFSS									X	X
Beaver						X		X			
Bighorn sheep	RFSS	X							X		X
Black bear		X				X		X	X	X	
Bobcat									X		
Bushy-tailed woodrat											X
Canada lynx	TEPC				X					X	
Coyote		X				X		X	X	X	
Deer		X				X		X	X	X	
Elk		X				X			X	X	
Fisher	RFSS		X					X		X	
Golden-mantled ground squirrel					X		X				X
Gray wolves	RFSS	X							X		
Grizzly bear	TEPC	X				X	X	X	X	X	
Hoary marmot							X				X

Species	Species Status	Grass-forb-shrub	Late-successional, old-growth, large trees	Snags	Coarse woody debris	Hard-wood Forest	High Elevation Habitats	Aquatic, Wetland, and/or Riparian	Dry Conifer (Warm-dry PVT)	Mixed Conifer (Warm Dry, Cool Moist, & Cold PVTs)	Cave, Cliff, Rock, other Geologic
Moose						X		X		X	
Mountain goat							X				X
Mountain lions					X				X		
Northern bog lemming	RFSS							X			
Northern flying squirrel			X	X	X	X				X	
Pika							X				X
Pine marten			X	X	X					X	
Red foxes		X									
Red squirrel					X	X				X	
Short-tailed weasel				X	X						
Shrews					X			X			
Snowshoe hare										X	
Voles		X			X			X			
Wolverine	TEPC						X				X

Plant Species Habitat Associations

Table 2 lists the plant species that are listed under the Endangered Species Act, those that were determined to be SCC, and those that were RFSS on the HLC NF and summarizes their habitat information. SCC would be adopted with all of the action alternatives. If the no alternative were selected, SCC would not be adopted. Rather, RFSS would be managed for by plan components.

Table 2. HLC NF Plant Species and associated habitat

Plant Species	Conservation Categories	Habitat Guild	Habitat Description
Adoxa moschatellina	SCC, RFSS, SOC, G3	Mesic-Montane-Disturbance-Talus	Vernally moist places in the mountains at the bottom of undisturbed, open rock slides that have cold air drainage.
Amerorchis rotundifolia	SCC, RFSS, SOC, Adjacent SCC	Wetland-riparian	Spruce forest around seeps or along streams, often in soil derived from limestone. High fidelity to a very narrow range of ecological tolerance that typifies a stable or near climax community and does not tolerate disturbance.
Aquilegia brevistyla	SCC, RFSS, SOC, S2	Wetland-riparian	Open woods and stream banks at mid-elevations in the montane zone.
Astragalus convallarius	SCC, SOC	Grasslands	Grasslands and open ponderosa pine woodlands in the valley and foothills. *Festuca scabrella, Festuca idahoensis* and *Elymus spicatus* are common bunchgrass associates.
Astragalus lackschewitzii	SCC, SOC, RFSS, S2, G2	Alpine	Open, gravelly and rocky slopes and ridgetops with calcareous soil and talus; subalpine to alpine.
Botrychium ascendens	RFSS, G3	Wetland-riparian	Stream, floodplains of glaciated bottoms dominated by shrubs with lush cover by forbs, grasses, and mosses in NW Montana. Often associated with wetlands dominated by spruce and alder. Mostly in sub-irrigated habitats 2700-6000 (9500) ft elevation
Botrychium crenulatum	SCC, RFSS, SOC, G3	Wetland-riparian	Various mesic sites from low to moderate elevations, including roadsides and other disturbed habitats. Can occur in open habitats, but more often in closed canopy habitats.
Botrychium paradoxum	SCC, RFSS, SOC, G3, Adjacent SCC	Wetland-riparian	Mesic meadows associated with spruce and lodgepole pine forests in the montane and subalpine zones; also found in springy western red cedar forests.
Braya humilis	SCC, SOC, S2 (S1 Nature Serve)	Mesic-Montane-Disturbance-Talus	*(Neotorularia humilis)* Sparsely vegetated, vernally moist, calcareous soil in the alpine zone and similar sites with sparse vegetation cover dominated by *Potentilla fruticosa, Carex scirpoidea, Phlox kelseyi* and *Zigadenus elegans* in montane settings along the Rocky Mountain Front.
Carex chordorrhiza	RFSS, Adjacent SCC, SOC	Peatlands	Wet, organic soil of fens in the montane zone

Plant Species	Conservation Categories	Habitat Guild	Habitat Description
Carex rostrata	RFSS, SOC, S2	Peatlands	Wet, organic soils of fens in the montane zone, including floating peat mats
Castilleja kerryana	SCC, SOC, G3	Alpine	Rocky or gravelly limestone substrates of Cambrian origin; slopes and ridges from upper subalpine krummholz or turf communities in upper alpine fell fields
Cypripedium parviflorum	SCC, RFSS, S3	Wetland-riparian	Fens, damp mossy woods, seepage areas, and moist forest-meadow ecotones in the valley to lower montane zones.
Cypripedium passerinum	SCC, RFSS, SOC,S2, Adjacent SCC	Wetland-riparian	Fens, damp mossy woods, seepage areas, and moist forest-meadow ecotones in the valley to lower montane zones.
Delphinium bicolor ssp. *calcicola*	SCC, T3 (variety equivalent to G3)	Grasslands	Shortgrass prairie and grass-sagebrush communities on limestone-derived soils, usually with coarse fragments at the surface, or on limestone outcrops. 4000-7000 m elevation.
Draba densifolia	SCC, SOC, S2	Alpine	Gravelly, open soil of rocky slopes and exposed ridges in the montane to alpine zones.
Drosera anglica	SCC, RFSS, SOC	Peatlands	With sphagnum moss in wet, organic soils of fens in the montane zone.
Drosera linearis	SCC, RFSS, SOC, S2, Adjacent SCC	Peatlands	With sphagnum moss in wet, organic soils of fens in the montane zone.
Erigeron lackschewitzii	RFSS, SOC, G3	Alpine	Exposed alpine settings (gravelly talus) with water-retaining calcareous soil derived from a dolomite substrate, rock-covered surfaces impeding water loss from shallow soil beneath, exposed, windy sites (saddles, protruding outcrops, crests of updraft chutes), and areas with first snowmelt and late soil recharge above 6000 ft.
Eleocharis rostellata	SCC, RFSS, SOC, Adjacent SCC	Peatlands	Wet, often alkaline soils, associated with warm springs or fens in the valley and foothills zones.
Elymus innovatus	SCC, RFSS, SOC, S2	Grasslands	Moist meadows, forest margins and openings along rivers and streams in the valley and lower montane zones.
Epipactis gigantea	SCC, RFSS, SOC, S2, Adjacent SCC	Wetland-riparian	Stream banks, lake margins, fens with springs and seeps, often near thermal waters.
Erigeron flabellifolius	SCC, SOC, G3	Mesic-Montane-Disturbance-Talus	Gravelly soil or talus in the subalpine and alpine zones.
Gentianopsis macounii	SCC, RFSS, SOC, S2	Peatlands	Wet, organic soil of calcareous fens in the valley and foothill zones.
Goodyera repens	SCC, RFSS, SOC	Mesic-Montane-Disturbance-Talus	North-facing, mossy forested slopes in the montane zone.

Plant Species	Conservation Categories	Habitat Guild	Habitat Description
Grindelia howellii	SCC, SOC, RFSS, G3, S2, Adjacent SCC	Grasslands	Vernally moist, lightly disturbed soil adjacent to ponds and marshes, as well as similar human-created habitats, such as roadsides and grazed pastures.
Juncus hallii	RFSS	Wetland-riparian	Moist grassland and sedge meadows from the montane to alpine zones. Flats or benches on the gentle to mid-upper slopes (3500) 6000-8800 feet elevation
Lycopodium dendroideum	SCC, RFSS, SOC, S2	Mesic-Montane-Disturbance-Talus	Moist, coniferous forest in the valley and lower montane zones.
Micranthes tempestiva	RFSS, G2, S2, SOC	Mesic-Montane-Disturbance-Talus	Vernally moist, open soil in meadows and on rock ledges in subalpine and alpine zones 7500-9500 feet elevation
Oxytropis podocarpa	RFSS, SOC, S1	Alpine	Gravelly ridges and slopes, often on limestone, in the alpine zone. Basins or on steep slopes and ridges with limestone-derived soils, 6500-8500 feet elevation
Phlox kelseyi var. *missoulensis*	SCC, RFSS, SOC, G3	Grasslands	Open, exposed, limestone-derived slopes in the foothills to exposed ridges in the subalpine zone.
Pinus albicaulis	TES - Candidate	Alpine	High elevation, harsh, exposed slopes and ridgetops
Polygonum austiniae	SCC, RFSS, SOC	Mesic-Montane-Disturbance-Talus	*(Polygonum douglasii var. austiniae)* Gravelly, often shale-derived soil of open slopes and banks in the montane zone.
Potamogeton obtusifolius	SCC, RFSS, SOC	Aquatic	Open water; Shallow water of lakes, ponds, and sloughs in the valley, foothill, and montane zones.
Potentilla nivea var. pentaphylla	RFSS, SOC	Alpine	Dry, shallow, gravelly soil or talus and scree of exposed ridges, slopes, and summits in the montane to alpine zones 4600-10000 ft elevation
Ranunculus pedatifidus	SCC, SOC	Wetland-riparian	Moist meadows and open woodlands in the montane to alpine zones.
Salix barrattiana	RFSS, S2, SOC	Alpine	Alpine habitat, 6500 – 9500 ft elevation
Schoenoplectus subterminalis	SCC, RFSS, SOC	Aquatic	Open water and boggy margins of ponds, lakes, and sloughs at 0.1-3 m depth in the valley, foothill, and montane zones.
Scorpidium scorpioides	SCC, RFSS, SOC, S2, Adjacent SCC	Peatlands	Exposed or submerged rocks in rivers and streams. Also found on wet soil in calcareous seeps and fens, and soil of bogs, ponds, and other wetlands. From low elevations to about 10,000 feet.
Sphagnum fimbriatum	SCC, SOC, S1	Peatlands	Nutrient-rich wet soil and peat, at the edges of bogs and poor fens on mineral soil, somewhat exposed to wooded fens. Elevation: low to high.
Stipa lettermanii	SCC, SOC, S1	Mesic-Montane-Disturbance-Talus	Coniferous forest (*Pinus contorta* and *Picea engelmannii*) with openings.

Plant Species	Conservation Categories	Habitat Guild	Habitat Description
Thalictrum alpinum	RFSS, S2, SOC	Mesic-Montane-Disturbance-Talus	Typically moist meadows or stony slopes in montane and lower subalpine areas. Can occur on drier, upper portions of hummocks. Sometimes along streams 4500-8500 feet elevation.
Trichophorum cespitosum	RFSS, S2, Adjacent SCC, SOC	Peatlands	Sphagnum-dominated fens and wet meadows in the montane to alpine zones. Rare in Montana.
Veratrum californicum	RFSS, S2, SOC	Wetland-Riparian	Wet meadows and streambanks in the montane and subalpine zones 5500-8000 feet elevation.

RFSS = Regional Forester Sensitive Species (alt A); SCC = Species of Conservation Concern (action alts); SOC = species of concern; S1 = state ranking 1; S2 = state ranking 2; G3 = global ranking 3.

Other Plant Species of Interest

Culturally Important Plant and Fungi Species

Several culturally important plant and fungi species are present on the HLC NF. Culturally important species include those that have been used historically and/or are presently used for ceremonies, rituals, nutrition, or medicinally. Small camas (*Camassia quamash*), thinleaf huckleberry (*Vaccinium membranaceum*), chokecherry (*Prunus virginiana*), common beargrass (*Xerophyllum tenax*), and bitterroot (*Lewisia rediviva*) are all culturally important plant species that occur on both forests. While small camas, thinleaf huckleberry, chokecherry, and bitterroot are prized for their edibility, common beargrass is important to western North American indigenous peoples for basketry, regalia, and medicinal purposes. Morel (*Morchella spp*.) mushrooms, highly prized for their flavor, are culturally important edible fungi species hunted and harvested by many across both forests.

Plant species of other interest

In addition to potential SCC, other plants and communities are of interest to the public or resource specialists. The values placed on these species include considerations such as high value or limited wildlife habitats, recreational uses, spiritual values, or importance to ecosystem integrity. Four plant guilds are identified as communities of interest; these are addressed in further detail in the Terrestrial Vegetation section because they are components of the coarse filter analysis for nonforested vegetation.

- Grasslands
- Mesic shrubland
- Shrub-steppe
- Xeric ecotones

Twelve individual species are identified as plants of interest.

- *Artemisia tridentata subsp. vaseyana* (mountain big sagebrush)
- *Camassia quamash* (camas)
- *Cercocarpus ledifolius* (mountain mahogany)
- *Lewisia rediviva* (bitterroot)
- *Purshia tridentata* (antelope bitterbrush)
- *Salix spp*. (willow)
- *Prunus virginiana* (chokecherry)
- *Vaccinium membranaceum* (thinleaf huckleberry)
- *Juniperus scopulorum* (rocky mountain juniper)
- *Pinus flexilis* (limber pine)
- *Pinus ponderosa* (ponderosa pine)
- *Populus tremuloides* (quaking aspen)

Artemisia tridentata subsp. vaseyana (Mountain Big Sagebrush)

Mountain big sagebrush (*Artemisia tridentata subsp. vaseyana*), an aromatic shrub of the Asteraceae family, dominates much of the shrub-steppe plant community across the HLC NF. It generally occupies open dry sites at elevations below montane forests where winters are cold and dry, spring and early summer months receive most precipitation, and drought is expected from mid-summer through the fall (Welch, 2005). Sagebrush steppe vegetation dominated by mountain big sagebrush is also characterized by the presence of native forbs and cool season perennial bunch grasses (e.g., Agropyron, Festuca, Koeleria, Poa, Stipa). Sagebrush steppe vegetation on the HLC NFs has high levels of native plant species diversity and provides essential habitat requirements for many wildlife species, such as the sagebrush sparrow (*Artemisiospiza belli*), greater sage-grouse (*Centrocercus urophasianus*), pronghorn antelope (*Antilocapra americana*), and sagebrush vole (*Lemmiscus curtatus*), while also providing valuable grazing land for livestock.

Mountain big sagebrush is sensitive to encroachment by conifers; studies have shown that in southwestern Montana, it is declining due to competition from Douglas-fir (Grove, Wambolt, & Frisina, 2005; Gruell, Brown, & Bushey, 1986). Douglas-fir expansion into grass and shrub communities may in part reflect natural ecotone dynamics, but overgrazing, climate changes, and fire exclusion have likely caused more extensive encroachment than would be present naturally. This species is also addressed in the Terrestrial Vegetation section of the DEIS.

Camassia quamash (Camas)

Camassia quamash (small camas) occurs in deep soils of wet meadows across the HLC NF. It is important to traditional cultures for nutrition, ceremonies, or rituals. Camas is apparently secure in Montana. Because digging the roots destroys the entire plant, care should be taken with regards to harvest in order to maintain populations.

Cercocarpus ledifolius (Curl-leaf Mountain Mahogany)

Cerocarpus ledifolius (*curl-leaf mountain mahogany*) is an evergreen shrub that occurs on limestone or sandstone stony slopes, cliffs, and rock outcrops from valleys to montane zones across the HLC NF. It grows in a variety of plant communities, including rocky habitats, xeric ecotones, and shrub-steppe. While its flowers are small and inconspicuous, the silver-haired, spiral, persistent style attached to each seed is notable. It provides an important food and cover source for wildlife year-round. Traditional cultures have used it for fuel, dyes, and many important medicinal purposes. Curl-leaf mountain mahogany is apparently secure in Montana. Although, with more frequent high severity fires, often related to increased fine fuel loads from exotic annual grasses, curl-leaf mountain mahogany populations are declining in many areas throughout its range (Hanson et al, 1999), as it is not a fire-sprouter and is killed by fires. This species is also addressed in the terrestrial vegetation section of the DEIS.

Kelseya uniflora (One-flower kelseya)

One-flower kelseya is a unique species that occupies crevices and limestone cliffs on the HLC NF. It creates large cushions and exhibits bright pink flowers in the spring. Naturalists seek out this plant for its unique habitat and early spring color. One-flower kelseya is endemic to Montana where it is apparently secure. In the adjacent state of Wyoming, it is considered imperiled. Due to the unique habitat one-flower kelseya occupies, disturbance is unlikely to impact populations. Climate change may contribute to changes in range or extent of populations.

Lewisia rediviva (Bitterroot)

Bitterroot occurs in well drained soils of sparsely vegetated grasslands across the HLC NF. It is important to traditional cultures for nutrition. Bitterroot is apparently secure in Montana. Because digging the roots destroys the entire plant, care should be taken with regards to harvest in order to maintain populations.

Purshia tridentata (Antelope Bitterbrush)

Antelope bitterbrush, a three to six foot tall shrub in the Rosaceae family, infrequently occurs on stony or sandy soil of grasslands, shrub-steppe, and open ponderosa-pine forest from valley to montane zones across the HLC NF. It provides an important food and/or cover source for ungulates, rodents, birds, and several insect species. Traditional cultures also use bitterbrush for many medicinal purposes. This species is also addressed in the terrestrial vegetation section of the DEIS.

The abundance and distribution of bitterbrush is largely influenced by climate and fire regimes. As a shade intolerant, nitrogen-fixing shrub, it is an early colonizer on disturbed sites in several plant communities (e.g., xeric ecotones, shrub-steppe) on the HLC NF. It competes with nonnative, invasive, annual grasses such as cheatgrass (*Bromus tectorum*), which are spreading rapidly throughout bitterbrush habitat. This invasion has increased fine fuel loads, causing more frequent high severity fires, where bitterbrush, considered a weak sprouter, is often killed. Sprouting ability following fire is influenced by fire severity and season, where bitterbrush may sprout following light-severity fires that occur in spring (Zlatnik, 1999). In Montana, bitterbrush communities have experienced declines of 10-30% in population size, range extent, and/or occupied area during the past 30 years.

Salix spp (Willow)

Many species of willow exist, and are of interest because of their habitat value, limited extent, and pressures exerted by factors such as grazing and fire suppression. Willows require a seasonally high water table and free water in the soil to survive and regenerate. Most species are shade-intolerant and those species that occur along streams in narrow steep valleys would likely not persist if conifers overtop and shade them. Browsing pressure by both native and domestic ungulates can lead to loss of vigor and eventually death if it is chronic and persists. These species are also addressed in the terrestrial vegetation section of the DEIS.

Prunus virginiana (chokecherry)

Chokecherry is often associated with mesic shrublands, moist forest, or riparian areas. It is important to traditional cultures for nutrition, ceremonies, rituals, and medicinal purposes. The berry is sought after and collected by members of the public for wildcrafting purposes. Chokecherry is secure within its range.

Vaccinium membranaceum (thinleaf huckleberry)

Thinleaf huckleberry occurs across the HLC NF and prefers open coniferous woods. It is important to traditional cultures for nutrition, ceremonies, rituals, or medicinal purposes as well as a food staple for wildlife. Commercial collections also occur for wildcrafting purposes. The abundance and distribution of thinleaf huckleberry is largely influenced by disturbance including fire regimes. Although thinleaf huckleberry can be difficult to establish, it often responds to favorably to disturbance and in the absence of natural fire, thinleaf huckleberry is less productive than it would have been historically.

Juniperus scopulorum (Rocky Mountain Juniper)

Rocky mountain juniper is a component of xeric ecotones as well as an understory species in dry forests. The abundance and distribution of juniper is largely influenced by climate and fire regimes. It tends to become abundant in the later stages of succession, where it slowly becomes established after other grasses and shrubs. This species is addressed further in the terrestrial vegetation section of the DEIS.

Pinus flexilis (limber pine)

Limber pine is a relatively long-lived, native five-needled pine which grows east of the Continental Divide. Although marginal for timber values, limber pine is an important pioneer species that provides watershed protection and wildlife habitat; it grows on dry sites at both upper and lower tree lines and in between on sites too harsh for other conifer species (Jackson et al. 2010). It occurs in the xeric ecotone and rocky habitats guilds, and on the HLC NFs its presence correlates with limestone substrates. It grows in association with whitebark pine at high elevations on the HLC NFs. This species is identified as a focal species for monitoring, and is addressed in further detail in the terrestrial vegetation section of the DEIS.

Pinus ponderosa (ponderosa pine)

Ponderosa pine is a shade-intolerant species that is highly resistant to fire mortality when mature due to its thick exfoliating bark, high open crown, high foliar moisture content, large buds, deep roots, and the ability to self-prune (Saveland, Bakken, & Neurenschwander, 1990). This species is addressed further in the terrestrial vegetation section of the DEIS.

Populus tremuloides (quaking aspen)

Aspen is highly valued for its contribution to biodiversity and habitat; with the exception of riparian areas, aspen communities are considered the most biologically diverse ecosystems in the Intermountain West (Campbell and Bartos 2001). It is addressed further in the terrestrial vegetation section of the DEIS.

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