USDA

United States Department of Agriculture

Sierra Nevada Forest Plan Monitoring Accomplishment Report 2014

Forest Service

Pacific Southwest Region

R5-MR-063

October 2015

Front Cover Photo
Spotted Owl: Sheila Whitmore

Sierra Nevada Forest Plan Monitoring Accomplishment Report for 2014

Sierra Nevada Forest Plan Implementation

In 2014 the Forest Service, Pacific Southwest Region, which includes California, Hawaii, Guam, and the Trust Territories of the Pacific Islands, continued several long-term monitoring studies in the Sierra Nevada. The studies focus on developing scientifically valid assessments of the status of several species and increasing understanding of how forest and rangeland management under direction in the Sierra Nevada Forest Plan Amendment (SNFPA) Record of Decision 2004 may affect species, ecosystems, and processes.

Contents

For more information:
Patricia Flebbe
Monitoring Coordinator
707.562.8682
pflebbe@fs.fed.us

Fisher and Marten Status and Trend Monitoring

This project, led by Dr. Jody Tucker, conducts annual, systematic surveys across the national forests of the Sierra Nevada to track the status and trend of carnivore populations, specifically Pacific fisher (*Pekannia pennanti*) and American marten (*Martes americana*). Data are also routinely collected using the same survey techniques for a suite of other co-occurring carnivores and small mammals including gray fox (*Urocyon cinereoargenteus*), bobcat (*Lynx rufus*), mountain lion (*Puma concolor*), ringtail (*Bassariscus astutus*), spotted skunk (*Spilogale gracilis*), striped skunk (*Mephitis mephitis*), black bear (*Ursus americanus*), and weasels (long-tailed and ermine; *Mustela spp*.).

In 2014 sampling was focused on the southern Sierra Nevada (Sierra and Sequoia National Forests) because the existing fisher population is limited to this area. Sample units are located on a modified version of the Forest Inventory and Analysis (FIA) grid, with center points of the units offset from the FIA points by 100 m in a random direction. Each unit consists of six baited survey stations encompassing ~ 0.8 km^2 area: three remote sensor cameras stations and three track plates stations outfitted with hair snares to collect genetic samples. The current (Phase II) sampling frame consists of 201 units on these two forests, and each year a random sample of units is completed (details of the Phase II sampling frame can be found in Zielinski et al. 2013 and in the 2011 SNFPA annual report).

Accomplishments

The carnivore monitoring program completed 106 sample units on the Sierra (Figure 1) and Sequoia National Forests (Figure 2). Hair samples for genetic analysis were collected at sample units that detected either a fisher or marten and were genotyped to identify individuals and their sex. Fishers were detected at 37 of these units (proportion of units occupied = 0.35) with genetic analysis finding only one recaptured individual (previously detected in 2011) and 21 new individuals. Marten were detected at 18 sample units (proportion of units occupied =0.17) with genetic analysis resulting in five recaptured individuals (previously detected in 2011-2012) and seven new individuals.

Additionally, in 2014 targeted sampling was conducted in the Kern Plateau Region of the Sequoia National Forest. The Kern Plateau is a unique area in the southern Sierra Fisher range on the east side of the Sequoia National Forest that differs environmentally from the west-slope of the Sequoia in vegetation, climate, and topography. Due to its unique environmental qualities scientists and managers have expressed a need to create a Kern Plateau specific habitat model for fisher, but sufficient data to fit such a model has been lacking. In an effort to increase the sample size and distribution of survey units in this region, the carnivore monitoring program, in conjunction with the Conservation Biology Institute, identified 22 potential survey locations on the Kern Plateau that could supplement the existing sampling frame, while maintaining a spacing between units that is required for sample units to be considered spatially independent and to be consistent with the existing monitoring protocol. In the fall of 2014 the monitoring crew completed sampling at 13 of these new Kern Plateau units, detecting fisher at three units, including one station detecting fisher within the perimeter of the McNally Fire (Figure 3). These

data are currently being used to help formulate Kern Plateau specific models for the southern Sierra Fisher Conservation Strategy.

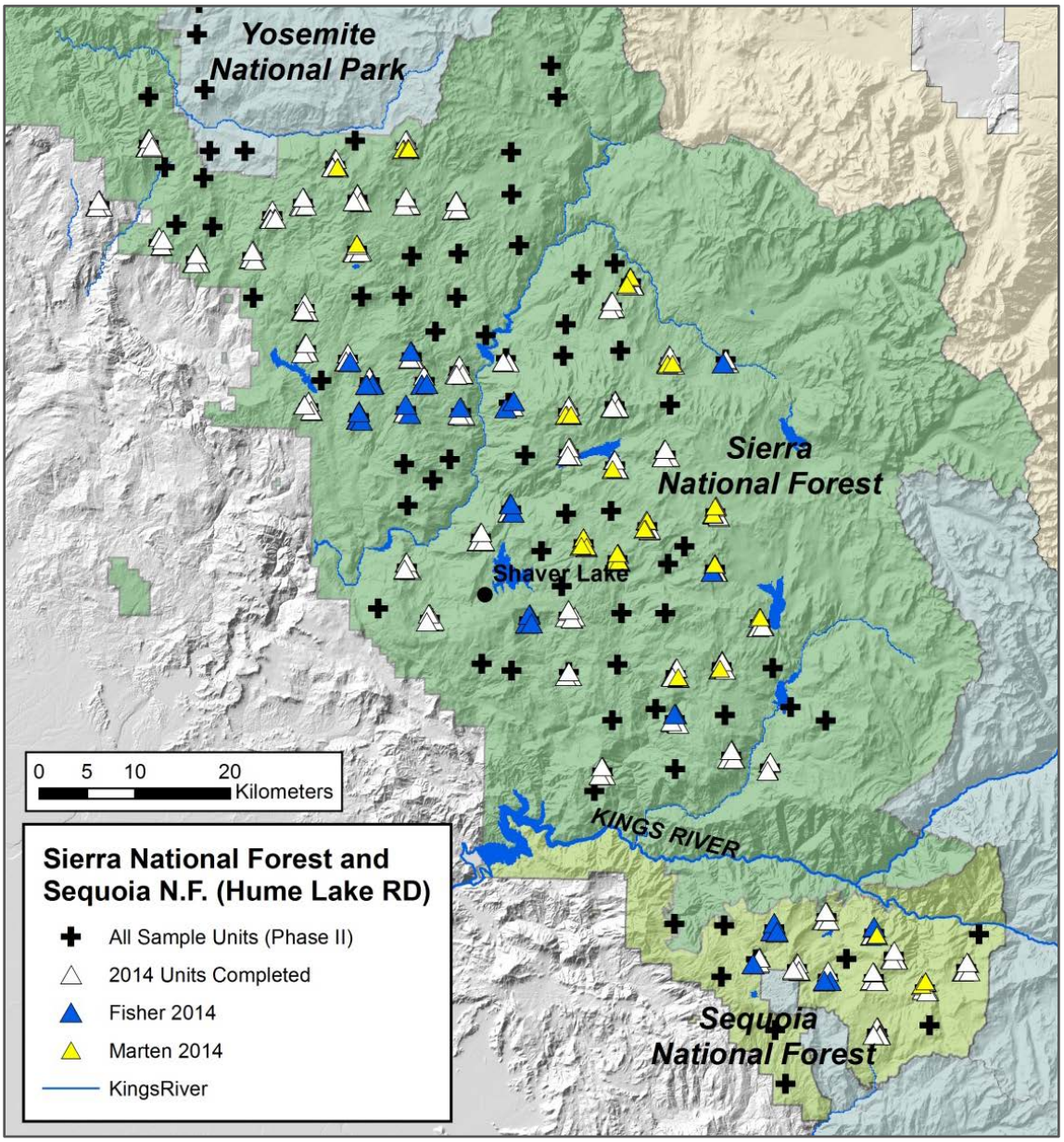

Figure 1. Map of the carnivore monitoring units on the Sierra National Forest and Hume Lake Ranger District of the Sequoia National Forest (black crosses). Units completed in 2014 are shown with white triangles, fisher detections with blue triangles, and marten detections with yellow triangles. Triangles are slightly offset for clarity and do not represent multiple sampling units.

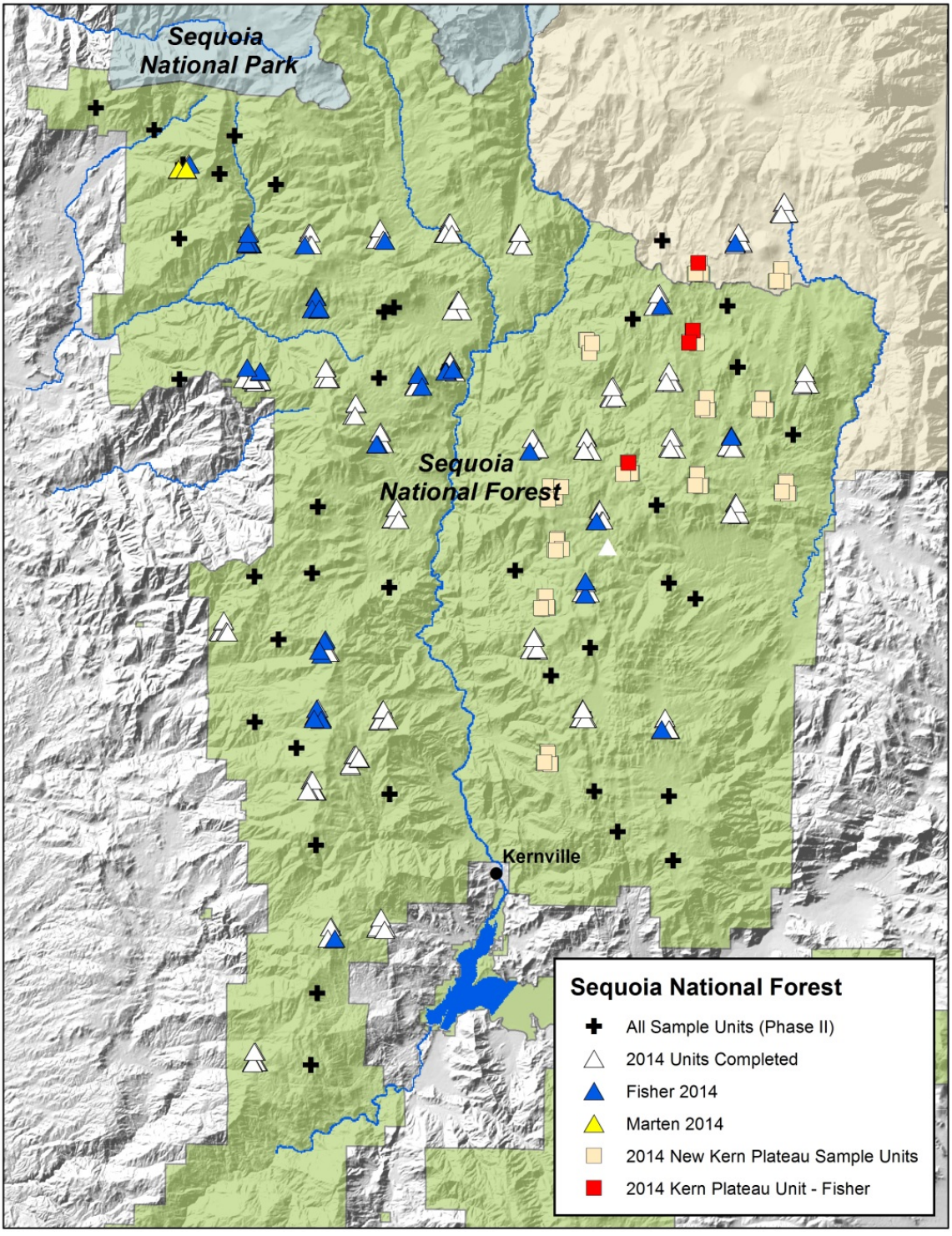

Figure 2. Map of the carnivore monitoring units on the southern portion of the Sequoia National Forest (black crosses). Units completed in 2014 are shown with white triangles, fisher detections with blue triangles, and marten detections with yellow triangles. New Kern Plateau units added in 2014 are shown with tan squares, and those new units detecting fisher are shown with red squares. Symbols are slightly offset for clarity and do not represent multiple sampling units.

Photo 1. A fisher detection via a remote sensor camera at a new sampling unit established on the Kern Plateau in 2014 within the perimeter of the 2002 McNally Fire. The bait (chicken wrapped in wire) is centered on the tree with gun brush hair snares installed to the bottom and sides of the bait to collect hair samples for genetic analysis.

Management Applications

Data from the carnivore monitoring program has been an important component in the development of the Southern Sierra Nevada Conservation Assessment and Strategy, which is a multi-agency effort to develop a scientifically sound approach for sustaining and recovering the southern Sierra Nevada fisher populations (Spencer et al. 2015). In addition to citing published research from the carnivore monitoring program, these documents integrated other unpublished monitoring data highlighting the differences between the Sierra and Sequoia National Forests in the elevational distribution of both fisher and marten, and the degree of overlap between each species on these forests. On the Sierra National Forest the majority of fisher detections are concentrated between 4,000-7,000 ft, whereas on the Sequoia National Forest fishers are detected over a wider and higher elevation range (Figure 4).

The monitoring data also shows a significant difference in the pattern of overlap between marten and fisher across their range in the southern Sierra Nevada. On the Sierra National Forest there is little overlap between the elevational distributions of fisher and marten. However, on the Sequoia National Forest there is complete overlap between these species (Figure 5).

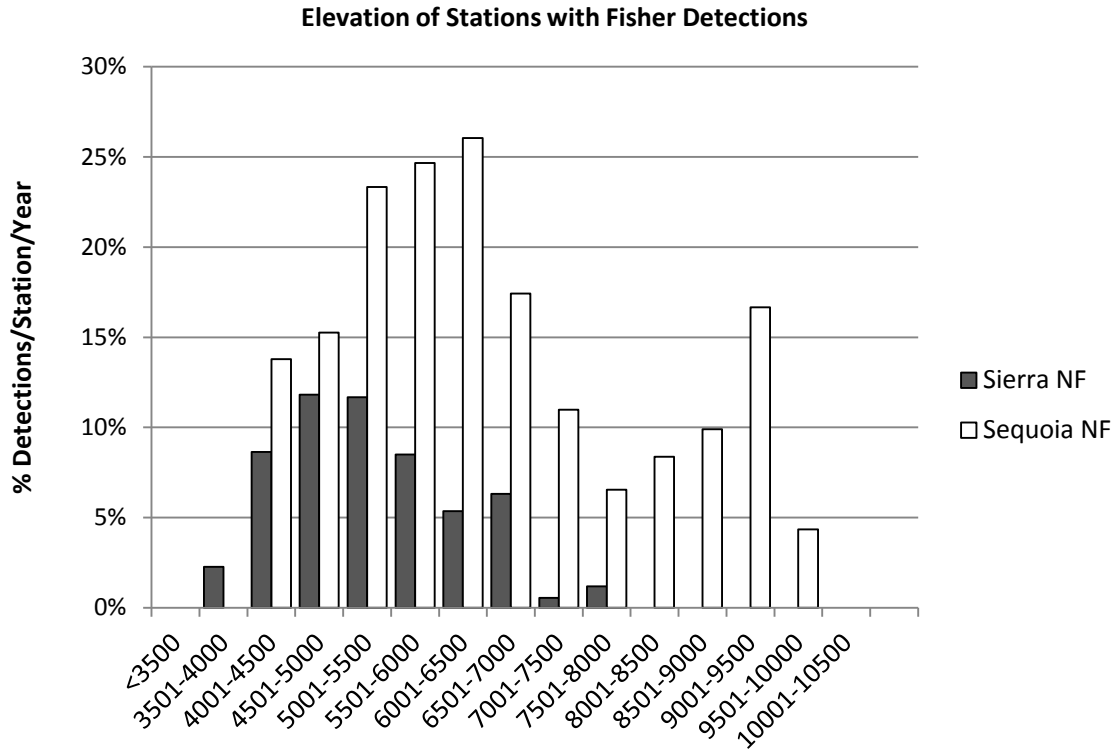

Figure 3. Histogram of the fisher detections at carnivore monitoring survey stations by elevation, 2002-2012 on Sierra and Sequoia National Forests.

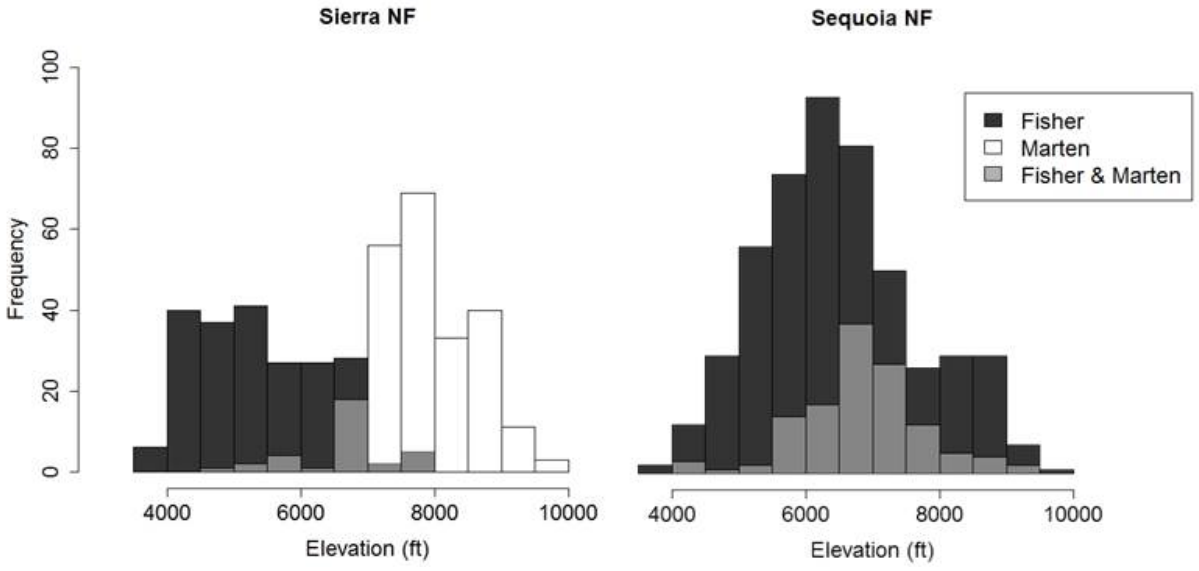

Figure 4. Histogram graphs comparing the overlap of the elevational distributions of fisher and marten on the Sierra versus the Sequoia National Forests.

Publications and presentations

In 2014 we submitted one manuscript for publication in an international peer reviewed journal, which is currently in review. This manuscript reported the results of a landscape genetic analysis to determine the landscape features influencing genetic connectivity in the southern Sierra Nevada fisher population and if these features varied by sex due to sex-biased dispersal or spatially due to landscape heterogeneity. This study found a stronger relationship between landscape features and genetic distance for females, the philopatric sex, than the more widely dispersing males. Landscape features influencing gene flow differed by both sex and geographic region. Conducting analyses by sex and by region allowed for the identification of landscape genetics relationships not discernible when analyzed together.

Presentations on scientific papers from the carnivore monitoring program were made at three major conferences in 2014: one Regional conference (western Section of the Wildlife Society, Reno, NV), one National conference (The Wildlife Society National Conference, Pittsburgh, PA), and one international (North American Congress for Conservation Biology, Missoula, MT).

Plans for 2015

We will continue to focus monitoring efforts on the southern Sierra fisher occupied area, and will resample a portion of the sample units used by Zielinski et al. 2013 to assess population trend using the same protocol that has been employed since in beginning of Phase 2 in 2011 (remote cameras, track plates and hair snares). Additionally, we plan on completing another new set of sample units on the Kern Plateau to continue to improve our ability to model habitat in this region.

Publications and Literature Cited

Tucker, JM, FW Allendorf, RL Truex, and MK Schwartz. In Review. The effect of sex-biased dispersal and spatial heterogeneity on modeling landscape resistance to gene flow.

Spencer, WD, SC Sawyer, HL Romsos, WJ Zielinski, RA Sweitzer, CM Thompson, KL Purcell, DL Clifford, L Cline, HD Safford, SA Britting, and JM Tucker. 2015. Southern Sierra Nevada fisher conservation assessment. Unpublished report produced by Conservation Biology Institute.

Zielinski WJ, JA Baldwin, RL Truex, JM Tucker, and PA Flebbe. 2015. Estimating trend in occupancy for the southern Sierra fisher (*Martes pennanti*) population. J Fish Wild Manage 4:3-19.

California Spotted Owl in the Eldorado Study Area

Long-term monitoring of California spotted owls (*Strix occidentalis occidentalis*) in the central Sierra Nevada is conducted by Drs. M. Zachariah Peery and R.J. Gutiérrez. This monitoring project is the longest such project on California spotted owls, and our methods are consistent with all other spotted owl monitoring projects (Blakesley et al. 2010). Our monitoring provides essential information about the status of the owl population in this region and facilitates forest management by providing locations and reproductive status of owls on the Eldorado and Tahoe National Forests. The Eldorado Density Study Area (DSA) is a contiguous area that we have surveyed annually since 1986. The Regional Study Area (RSA) is a group of owl territories surrounding the DSA that we have surveyed since 1997. We have participated in the Sierra Nevada Adaptive Management Project (SNAMP) study since 2007, which is assessing the ecological and social impacts of "strategically placed area treatments" (SPLATS) being conducted under the 2004 Sierra Nevada Framework. The SNAMP Study Area (Last Chance Study Area) is also a contiguous area, adjacent to and north of the DSA. We no longer monitor this area, as the field effort ended in 2013 for this study area. In addition, the King Fire burned ~38,000 acres of the 85,000-acre DSA (45%) in the fall of 2014, and most of this burned area was classified as high severity (Figure 5).

Photo 2. Adult California spotted owl (photo by S. Whitmore).

2014 Monitoring Results

During the 2014 field season we conducted 4 complete sets of nighttime surveys across our study areas (DSA, RSA). Thirty-six of 75 territories were occupied (35 pairs and 1 single bird). We resighted or captured 70 adults or sub-adults. We assessed reproduction at 34 territories and found 27 nests (including 7 failed nests). We captured 28 of the 35 fledglings observed. In 2014, we observed the highest reproduction rate (57.1% of confirmed pairs produced young) since 2002; however, we continued to observe low territory occupancy (naïve occupancy = 48.0%). We did not detect any barred owls (*Strix varia*) or sparred owls (spotted x barred hybrid) on any of the study areas in 2014.

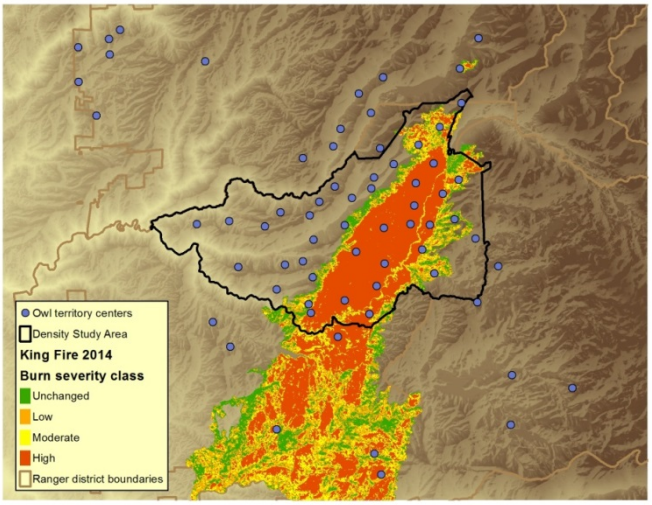

Figure 5. Eldorado Spotted Owl Demography study areas in the Central Sierra Nevada, CA with the burn severity layer from the King Fire. The blue circles represent owl territories that we monitor.

Publications

- We conducted a retrospective analysis for SNAMP to evaluate the relationships between habitat change (fuel treatments, private harvests, etc.) and owl occupancy, survival, and reproduction (Tempel et al., 2014a). Results suggested medium-intensity timber harvests had a negative influence on reproduction, but we found only weak support for this effect. For survival, adult males had higher survival rates than sub-adults and females, respectively. Non-juvenile survival and territory colonization were positively related to the amount of high-canopy-cover (≥70% canopy cover) forest within owl territories, while territory extinction was negatively related to the amount of high-canopy-cover forest. Wildfire had a negative effect on territory colonization but did not affect territory extinction. However, wildfire's negative effect on colonization was primarily due to two territories that lost nearly all of their high-canopy-cover forest during the 2001 Star Fire and were unoccupied for the remainder of the study. Four other territories that burned to a lesser degree during the Star Fire remained occupied every year after the fire, and therefore did not influence the colonization estimates. Sensitivity analyses showed that the amount of high-canopy-cover forest had a strong, positive effect on both population growth rate and equilibrium occupancy within owl territories.
- We developed an integrated population model (IPM) to estimate finite annual rates of population change (λ) and realized population change on the DSA from 1990-2012 (Tempel et al., 2014b; Figure 6). We found a 50% decline in owl abundance over the 23-year period, as the realized population change was 0.501 (95% credible interval = 0.383–0.641). The geometric mean of λ was 0.969 (95% credible interval = 0.957–0.980), but the cumulative effect of small annual declines resulted in a large population decline during the 23-year study. Our IPM incorporated data on population counts, mark-recapture histories, and reproduction. We used a multi-state occupancy model to obtain annual "counts" of the number of adults and young produced, rather than using naïve counts that did not account for imperfect detection. These counts were then used as input data, along with the mark-recapture and reproductive data, for the IPM. The larger decline estimated by the IPM, relative to Tempel and Gutiérrez (2013), was the combined result of including

Photo 3. Adult spotted owl with nestling (photo by S. Whitmore).

an additional five years of data in the IPM analysis and an increase in territories that were occupied by single owls during the study.

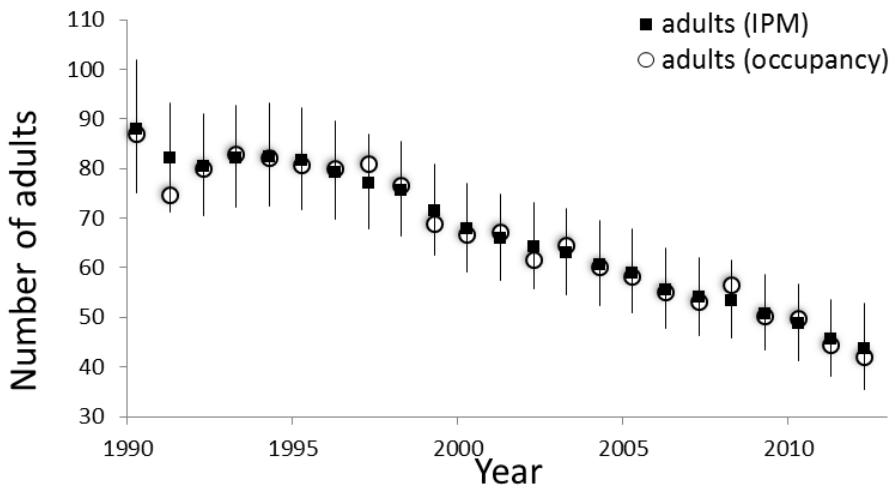

Figure 6. Posterior means of the estimated number of territorial adults in the Density Study Area from an integrated population model (IPM) for California spotted owls in the central Sierra Nevada, 1990–2012. The posterior means of the estimated number of adults from a multi-state occupancy model are also shown (from Tempel et al., 2014b).

- We tested for costs of reproduction in the California Spotted Owl, and assessed whether the costs of reproduction in the previous year could influence reproduction in the subsequent year, and if this could be responsible for biennial cycles in reproductive output (Stoelting et al., 2015). Results revealed that breeding reduced the likelihood of reproducing in the subsequent year by 16% to 38%. We also found that costs of reproduction in year t-1 were correlated with climatic conditions in year t, with evidence of higher costs during the dry phase of the El Nino–Southern Oscillation. While our simulation showed that costs of reproduction could create biennial cycles, we found that the cost of reproduction was small in spotted owls, and we hypothesize that the reproductive cycles are related to as-yet-unmeasured processes, possibly environmental conditions or prey cycles.
- We investigated the use of private lands for foraging by spotted owls (Williams et al., 2014). We used nighttime locations from our previous telemetry study (Canopy Reduction Study from 2006-2007) to model habitat selection based on land ownership (public and private) by foraging owls. Owls used private land less than expected based on availability. The log probability of an owl's foraging location was 15% greater on public land than on private land, indicating that owls preferentially foraged on public land.

Management Applications

Our monitoring in 2014 provided further evidence for a long-term decline in the population rate of change on our study area (Tempel et al., 2014b). These findings suggest prudent management of spotted owl habitat. Based on our findings from the SNAMP retrospective analysis, the amount of high-canopy-cover forest was the habitat variable most strongly correlated with population growth and equilibrium occupancy at the scale of individual territories (radius=0.70 miles). Our results suggest that fuel treatments that occur in forests with lower canopy cover (<70% canopy cover) or that do not significantly reduce canopy cover in high canopy-cover forests are less likely to have adverse impacts on spotted owls, particularly if fuel treatments primarily remove ladder fuels and small-diameter trees. We recommend that managers consider the existing amount and spatial distribution of high-canopy-cover forest before implementing fuel treatments within an owl territory, and that treatments be accompanied by a rigorous monitoring program.

Technology Transfer

Our 2014 technology transfer activities included a public SNAMP Information Transfer (IT) meeting in June. Twenty-eight interested parties attended in person and seven joined online, including members of the public, public-agency employees, and stakeholder groups (e.g. private timber companies and environmental groups). We presented our recent findings, answered questions from the audience, and discussed our recent publications and our future plans. We also participated in SNAMP quarterly and annual meetings of SNAMP MOU partners. We participated in a SNAMP field trip to the American Fire area. We also led USFS biologists to breeding owl sites on two separate occasions so that they could observe our data collection methods.

We shared 2014 owl survey data (territory occupancy, detection and nest locations, and reproductive status) with the USFS, California Department of Fish and Wildlife, and US Fish and Wildlife Service Bird Banding Laboratory. We continue to maintain the spotted owl research websites of Dr. Gutiérrez and Dr. Peery, which contain links to .pdf files for many of the papers we have published over our 30 years of owl work.

Plans for 2015

We will continue monitoring owls on the Density and Regional Study Areas for reproduction, survival, and territory occupancy from April through August 2015. We plan on investigating the impacts of the King Fire (and salvage logging) on the owls in the Density Study Area with the use of GPS and radio tags to track foraging locations of owls residing in or near the perimeter of the King Fire. We are currently collaborating with the Fire and Forest Ecosystem Health team of SNAMP on a prospective analysis of fire effects on owl habitat and demography. Results will be available in 2015. Finally, we will continue to be involved in all SNAMP-related events, including the final public meeting planned for May 2015.

Publications and Literature Cited

Blakesley, J.A., M.E. Seamans, M.M. Conner, A.B. Franklin, G.C. White, R.J. Gutiérrez, J.E. Hines, J.D. Nichols, T.E. Munton, D.W.H. Shaw, J.J. Keane, G.N. Steger, and T.L. McDonald. 2010. Population dynamics of spotted owls in the Sierra Nevada, California. Wildlife Monographs 174.

Tempel , D.J, and R.J. Gutiérrez. 2013. Relation between occupancy and abundance for a territorial species, the California spotted owl. Conservation Biology 27:1087-1095.

Tempel, D.J., R.J. Gutiérrez, S.A. Whitmore, M.J. Reetz, R.E. Stoelting, W.J. Berigan, M.E. Seamans, and M.Z. Peery. 2014a. Effects of forest management on California spotted owls: implications for reducing wildfire risk in fire-prone forests. Ecological Applications 24(8):2089-2106.

Tempel, D.J., M. Z. Peery, and R. J. Gutiérrez. 2014b. Integrated population models for wildlife conservation: An example with the California spotted owl (*Strix occidentalis occidentalis*). Ecological Modelling 289: 86–95.

Stoelting, R.E., R.J. Gutiérrez, W.L. Kendall, and M.Z. Peery. 2015. Life history trade-offs and reproductive cycles in Spotted Owls. The Auk 132(1): 46-64.

Williams, P.J., R.J. Gutiérrez, and S.A. Whitmore. 2014. Use of private lands for foraging by California spotted owls in the central Sierra Nevada. Wildlife Society Bulletin. 38(4): 705-709.

Sierra Nevada Adaptive Management Project

The Sierra Nevada Adaptive Management Project (SNAMP) was initiated in 2007 and is a joint effort by the University of California, University of Wisconsin, state and federal agencies, and the public to study management of forest lands in the Sierra Nevada. The intended result is a multi-resource assessment of effects of Forest Service fuel treatments and fire on water, wildlife, fire, forest health, and public participation in an adaptive management framework.

During 2014, the SNAMP Science Team worked on preparation of the final report. The SNAMP final report was completed during 2015.

Management Indicator Species

Reports for MIS monitoring are available from several sources:

- American marten
- Black-backed woodpecker
- California Spotted Owl
- Fox Sparrow, Hairy Woodpecker,Mountain Quail, and Yellow Warbler

Forest Monitoring Summary

October 1, 2013 to September 30, 2014 (FY 2014)

This summary is based on reports from nine national forests (NFs) and the Lake Tahoe Basin Management Unit (LTBMU) in the Pacific Southwest Region. We did not receive a report from the Humboldt-Toiyabe, in the Intermountain Region, which has only very small portions of the forest in the area managed under the SNFPA. Sierra Nevada NFs have completed nearly all FACTS (Forest Activity Tracking System) database entry for projects through FY 2014.

The LTBMU and Plumas, Sierra, Stanislaus, and Tahoe national forests generally conducted landscape-level assessments in designing fuel treatments that are reported as accomplished in FY 2014.

In 2014, fuel treatments were conducted on 85,664 acres on the Region 5 Sierra Nevada national forests (Table 1). Of those acres, 36% were located in the wildland-urban interface (WUI). The regional goal was to have 50% of all initial fuel treatments in the WUI (SNFPA ROD, page 5), and we have now completed many of those treatments.

Table 1. Fuel treatments in the WUI by forest for 2014.

Forest	Acres treated in WUI	Percent of total treated in WUI
Eldorado	777	29
Inyo	1,373	44
Lake Tahoe Basin	5,266	99
Lassen	1,783	15
Modoc	938	8
Plumas	814	6
Sequoia	2,671	100
Sierra	7,673	59
Stanislaus	4,242	37
Tahoe	5,051	46
TOTAL	30,588	36

Fuel treatments in California Spotted Owl and Goshawk PACs

For 2014, we made changes in the FACTS (Forest ACtivity Tracking System, our corporate database) database query we use to report acres of fuel treatments in protected activity centers (PACs). These changes mean that we include a few more activities as “vegetation treatments”

for California spotted owl (Standard and Guideline 80; SNFPA 2004) and "mechanical treatments" for Northern goshawk (Standard and Guideline 81; SNFPA 2004) than we did in reports for previous years. Each such treatment consists of a series of activities (or steps) within a treatment area, which are recorded in FACTS. Our query "dissolves" multiple activities within a given treatment area to arrive at the number of acres treated. Fuel treatments in California spotted owl and goshawk PACs are summarized in Table 2. Treated acres represent less than 0.5% of CSO PACs and about 0.3% of goshawk PACs.

Table 2. Fuel treatments in California spotted owl and Northern goshawk PACs by forest for 2014. Treatment acres are not reported for the Humboldt-Toiyabe NF because only a very small portion of the forest is in the Sierra Nevada. Data were pulled from FACTS June, 2015.

Forest	Treatment Acres in California Spotted Owl PACs	Treatment Acres in Goshawk PACs
Eldorado	20	2
Inyo	0	21
Lake Tahoe Basin	465	150
Lassen	181	268
Modoc	0	0
Plumas	280	60
Sequoia	28	7
Sierra	754	113
Stanislaus	4	0
Tahoe	350	2
TOTAL	2,082	624

In previous annual reports, we reported a cumulative total of treatments in PACs, calculated by adding treatment acres for the reporting year to the cumulative total from the previous annual report. These cumulative estimates are overestimates of actual acres treated because some treatments are implemented over more than one year. Prior to 2010, forests were either directly reporting their treatments or were allowed to modify the treatment acres reported in FACTS; decisions about what activities to include in the estimate were inconsistent. In recent years, data were extracted from FACTS, and we have been able to eliminate duplication within a single year as described above. For this and subsequent reports we continue to extract data from FACTS and eliminate duplication of acres treated both within a single year and across more than one year.

For the 2014 cumulative total, we used this new query process for each year in the past decade (2005-2014), eliminating many inconsistencies and year-to-year duplications. However, we based all the annual estimates on the PAC boundaries as of June, 2015, rather than at the time treatments occurred. Boundaries of PACs are modified during project planning to avoid intersections with treatment areas (S&G 71, SNFPA 2004) and to replace acres lost to fire

(SNFPA 2004, p. 37). After changes are made, historic PAC boundaries cannot be recovered from the database. Originally, spotted owl PACs totaled 421,780 acres and goshawk PACs totaled 108,158 acres. Currently, spotted owl PACs total 456,091 acres and goshawk PACs total 193,701 acres. Total acreage in both spotted owl and goshawk PACs increased because new nest sites were identified or because acreage was added to some PACs. Finally, because these estimates are based on current PACs rather than PAC boundaries at the time treatments occurred, we now count places where fuel treatments were conducted in non-PAC areas that are now part of PACs.

Treatments within California spotted owl PACs have occurred on eight of the national forests in the Sierra Nevada bioregion during fiscal years 2005-2014:

- 1,810 acres on the Eldorado NF,
- 1,230 acres on the Lake Tahoe Basin Management Unit,
- 455 acres on the Lassen NF,
- 1,426 acres on the Plumas NF,
- 939 acres on the Sequoia NF,
- 7,045 acres on the Sierra NF,
- 5,883 acres on the Stanislaus NF, and
- 1,880 acres on the Tahoe NF.

The total of 20,668 acres treated within spotted owl PACs since 2005 (one decade) is about 4.5% of the 456,091 acres of spotted owl PACs designated within the Sierra Nevada. The ROD for SNFPA limits vegetation treatments to no more than 5% of the acres in spotted owl PACs per year and 10% per decade (page 61).

A number of treatments have been conducted in Northern goshawk PACs since 2005:

- 223 acres on the Eldorado NF,
- 73 acres on the Inyo NF,
- 1,097 acres on Lake Tahoe Basin Management Unit,
- 1,672 acres on the Lassen NF,
- 1,543 acres on the Modoc NF,
- 504 acres on the Plumas NF,
- 50 acres on the Sequoia NF,
- 864 acres on the Sierra NF,
- 1,011 acres on the Stanislaus NF, and
- 763 acres on the Tahoe NF.

The total of 7,802 acres treated in goshawk PACs since 2005 (one decade) is about 4% of the approximately 193,701 acres in goshawk PACs. The ROD for SNFPA limits vegetation treatments to no more than 5% of the acres in goshawk PACs per year and 10% per decade (page 61).

The ROD requires evaluation of spotted owl PACs after potentially stand replacing fires to determine whether PACs or PAC acres that may have become unsuitable should be replaced (SNFPA ROD, page 37). For FY 2013 (allowing a 1-year delay to assess effects):

- On the Sierra NF, 7 PACs were affected by stand-replacing fires as described in Table 3. Replacement acres were found for the PACs.

Table 3. California spotted owl PACs significantly diminished by wildland fire on the Sierra NF during 2013.

PAC	Acres burned and changed to non-suitable owl habitat
FRE0026	313
FRE0031	380
FRE0101	302
FRE0102	307
FRE0103	313
FRE0110	128
FRE0112	1

- On the Stanislaus NF, 149 acres in one spotted owl PAC (TU00170) were affected by the Power Fire; replacement acres are available. The Stanislaus NF lost many PACs to the Rim Fire in 2013. The spotted owl PACs in Table 4 were rendered unsuitable.

Table 4. California spotted owl PACs significantly diminished by the Rim Fire on the Stanislaus NF during 2013.

PAC	Acres burned at high severity
TUO0010-Soldier Creek	46
TUO0011-Big Creek	21
TUO0012-Ackerson Creek	105
TUO0019 McCauley Ranch	0
TUO0024-South Fork Tuolumne	16
TUO0025-Middle Fork	166
TUO0026-Rush Creek	81
TUO0027-North Bear Mountain	164
TUO0028-Bear Mountain	238
TUO0029-Granite Creek	297
TUO0030-Wilson Meadow	297
TUO0031-Reed Creek	273
TUO0032-Reynold's Creek	15
TUO0034-Niagara Creek	247
TUO0039-Ackerson Mountain	55
TUO0040-Middle Fork Tuolumne	145
TUO0053-Brushy Creek	0
TUO0054-Thompson Peak	4
TUO0059-Lower 13 Mile Creek	73

PAC	Acres burned at high severity
TUO0061-Bear Spring Creek	124
TUO0065-Lower Reynold's Creek	4
TUO0071-North Mountain	254
TUO0072-Femmons Meadow	225
TUO0078-Crocker	179
TUO0085-Harden Flat NW	135
TUO0095-Corral Creek	305
TUO0129-Upper Two Mile Creek	2
TUO0130-Camp Clavey	56
TUO0145-Bear Creek	286
TUO0146-Hunter Creek	119
TUO0148 Upper 13 Mile Creek	5
TUO0149 Cottonwood Creek	78
TUO0151 Lower Cottonwood Creek	71
TUO0176-Clavey-Wolfin	0
TUO0177-Ascension Mountain West	215
TUO0187 Thompson Meadow	0
TUO0188Loney Creek	9
TUO0205-N Niagara	0
TUO0210 Buchanan	0
TUO0218-Lower Skunk Creek	136
TUO0219-Upper Cherry Creek	76
TUO0255 Box Spring	53
TUO0256-Clavey River	5
TUO0257 Westside East	258
TUO0258 Westside West	137
TUO0261 Upper Camp 25	3
TOTAL	**4978**

After the Rim Fire, we consulted with PSW regarding the post-fire assessment and the probability of continued occupancy in spotted owl PACs. Based on that assessment, we:

- Retained 27 PACs and did not remap even the high severity burned areas, based on PSW current research.
- Remapped 9 PACs to varying extents, based on what habitat was available in close proximity to the PAC.
- Re-established 4 PACs based on 2014 survey results.
- Retired 6 PACs as there was no habitat remaining within 1.5 miles of the pre-fire PAC.

- On the Tahoe NF, 9 PACs were affected by stand-replacing fires as described in Table 5. Replacement acres were found for 7 of the 9 PACs.

Table 5. California spotted owl PACs significantly diminished by wildland fire on the Tahoe NF during 2013.

PAC	Acres burned and changed to non-suitable owl habitat
PLA0004	153
PLA0063	89
PLA0025	31
PLA0071	39.5
PLA0088	0
PLA0096	18
PLA0102	184
PLA0134	13
PLA0138	8

The Sierra Nevada national forests identified fuels treatments in great grey owl PACs and fisher and marten den site buffers:

- The LTBMU treated 89 acres in marten den site buffers.
- Sierra NF treated 92 acres in great grey owl PACs.
- Sierra NF also treated 640 acres in fisher den buffers.

The ROD allows some vegetation treatments in these areas (SNFPA ROD, pages 61-62).

Forests used the flexibility in S&G #71 to change spotted owl and goshawk PAC boundaries to implement projects during 2012:

- Sierra NF modified one spotted owl PAC. Previously, FRE0113 (Coyote Restoration Project) incorporated a total of 551 acres of which 151 were PAC. Now, FRE0113 incorporates 630 acres of which 305 are PAC.
- Stanislaus NF modified two spotted owl PAC boundaries: CAL0034 (2 acres) and CAL0027 (7 acres).

Implementation monitoring was conducted on projects during 2014 as follows:

- Eldorado NF conducted monitoring on 25% of projects.
- Inyo NF conducted monitoring on 75 to 100% of projects.
- Lake Tahoe Basin Management Unit conducted monitoring on 100% of projects.
- Modoc NF conducted monitoring on 85% of all projects and 100% of vegetation and fuels projects.
- Plumas NF conducted monitoring on 94% of projects.
- Sierra NF conducted monitoring on 100% projects.
- Stanislaus NF conducted monitoring on 20% of projects.
- Tahoe NF conducted monitoring on 95% of projects and BMP monitoring on all projects with silvicultural waivers

Forest Relations with Tribes

Sierra Nevada national forests maintain Government-to-Government relationships with the tribes in the region. They consult and cooperate with tribes on culturally important vegetation, prescribed burning and fuel reduction, and other forest management activities. Forests protect and provide access to sacred and ceremonial sites and tribal traditional use areas. Some specific new instances where the forests worked with tribes on projects in 2014 include:

Inyo NF

The Inyo National worked with Forest Raymond Andrews, Bishop Paiute Tribe THPO, to plan a piaga (Pandora moth caterpillar) field visit on the Mammoth Ranger District in June, 2014. Roughly 40 people attended, including adults and youth from Bishop Paiute, Big Pine Tribe, Mono Basin Paiute, Fort Independence Paiute and Forest line officers and staff. After an opening prayer and introductions, Raymond Andrews spoke to the group about the Paiute way to gather, prepare and store piaga. Stops were planned to see and collect piaga and view traditional storage and collection features. Raymond helped the children clean a piaga ring with traditional tools before the group enjoyed an outdoor feast.

Heritage staff collaborated with Big Pine Tribal Historic Preservation Officer Bill Helmer and elder Ross Stone to sponsor a youth education field trip for the Big Pine Indian Education Center in late September, 2014. Glen Nelson said an opening prayer and provided instruction on native Paiute language. Ross Stone spoke about tradition and respect. The children read a contact-period story about pinon nut collection, discovered and learned about two storage features, visited an ancient encampment and used long poles to collect nuts in Harkless Flats.

Inyo National Forest Green Team members and the Bishop Paiute Tribe Environmental staff collaborated on an “Exploring a Wetland” activity for youth. Over a period of 3 days, all local area 3rd grade classes toured the Tribe’s Conservation Open Space Area (COSA), participated in a mapping exercise and learned about local flora.

Lake Tahoe Basin Management Unit

Forest staff worked with Office of General Counsel to develop Subpart C regulations for activity prohibitions at the Cave Rock Management Area. We worked with the Tribe to develop better protocol for Tribal access to Baldwin Beach concession area. Forest Fire Staff and Law Enforcement worked with the Tribe to resolve tribal access issues at Skunk Harbor.

Lassen NF

The Lassen NF has been working with Pit River Tribe to draft a master stewardship agreement for future stewardship projects. A key component of this collaboration is that that the Tribe is partnering with Lomakatsi Restoration, a non-profit organization that works with Tribes to develop and implement forests and watershed restoration projects in Oregon and Northern California. We established, for the first time, a 5-year fire Memorandum of Agreement with the

Susanville Indian Rancheria to utilize their Type 3 and Type 6 engine crews. In collaboration with the Susanville Indian Rancheria, we invited the Lassen Volcanic National Park to participate in quarterly consultation meetings, which resulted in combined consultation and relation building.

Modoc NF

Modoc NF has been working with the Pit River Tribe in drafting a master stewardship agreement for future stewardship projects. A key component of this collaboration is the Tribe partnering with Lomakatsi Restoration, a non-profit organization that works with Tribes to develop and implement forests and watershed restoration projects in Oregon and Northern California.

Modoc NF employees coordinate with the Pit River Tribal Cultural Committee and Klamath Tribes Natural Resources Staff through quarterly Consultations and more frequent Cultural Committee meetings. At this time, Forest staff is working with tribal representatives to address safety and respect issues at obsidian mines and other sacred sites.

Forest Public Affairs and Fire personnel are currently working with tribal representatives on outreach to Pit River Tribal members to share information regarding individual contracting requirements for fire suppression. A workshop is being planned in conjunction with CalFire to provide the information needed for a tribal member who owns equipment or runs a crew to know exactly what they need to do to become Forest Service or State wildfire contractors.

Plumas NF

Plumas NF has been working with Mountain Maidu Tribes and the Washoe Tribe of Nevada and California to replace derogatory place names on the Plumas NF. As a result, two place names with a derogatory name (Digger Creek and Digger Ravine) have been changed to Maidu names (Bey Cha Creek and Bey Cha Ravine) using the USGS name change proposal process.

In FY 2014, through the use of a 5-year Master Participating Agreement, the Plumas NF partnered with the Mooretown Rancheria to complete three separate projects, two of them in the Pendola fire restoration area. The project work included grub and release work, hand cut and pile work, and grapple pile work completed by Rancheria forestry crews. The collaborations resulted in 182 total acres treated and $199,000 obligated to support the Tribe's Manpower Program.

Plumas NF participated in the Genesee Valley Traditional Ecological Knowledge Symposium at Heart K Ranch, June, 2014. Members of Plumas Audubon Society, Feather River Land Trust, Maidu Summit Consortium, Mountain Maidu elders and practitioners, and leadership from the Plumas NF met together to discuss integration of traditional ecology into land conservation and public forest restoration.

Sierra NF

Forest Tribal Forums engage tribes on a quarterly basis allowing for a sharing of information platform for tribal and forest concerns. Tribal forums meet the needs of the busy schedules of

our tribes and forest leadership by allowing everyone the opportunity to meet at annual forecasted dates and times to discuss collaborated topics of interest. The Sierra NF has a Memorandum of Understanding for consultation with the North Fork Rancheria of Mono Indians. A Memorandum of Agreement initiated with the North Fork Mono Tribe (Non-Federally Recognized Tribe) at the end of the FY 2014 has been discussed between the Forest Supervisor and Tribal Chairman. The document has been submitted to the Office of General Counsel for review.

On April 2014 the Western Divide RD, in conjunction with Inter Tribal Timber Council, attended a field trip with the Tule River Indian Reservation Tribal leadership and Council Forest Natural Resource staff, to tour the Tule River Reservation Protection Project area. At this time the tribe was also presented with a copy of the Environmental Impact Statement for the proposed project.

Throughout FY 2014 the Sierra NF has been engaging the tribes to determine land use practices, tribal priorities, and consideration for traditional ecological knowledge. The forest plan revision process will incorporate some of these practices and traditional ecological knowledge into the Land and Resource Management Plans for the Sierra, Sequoia, and Inyo NFs. Tribes have shared information on fire areas of concern, explained plans and recommendations underway to restore areas identified, and incorporated tribal feedback into planned mitigation efforts.

Stanislaus NF

Stanislaus NF involved the Tribe in intense conversation on mushroom collection on the forest, conducted multiple field trips to review Rim Fire Restoration and Reforestation, and protected two areas on the forest considered sacred.