USDA

Sierra Nevada Forest Plan

Monitoring Accomplishment Report for 2011

United States Department of Agriculture

Forest Service

Pacific Southwest Region

R5-MR-051

Sierra Nevada Forest Plan Monitoring Accomplishment Report for 2011

Sierra Nevada Forest Plan Implementation

In 2011 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. This year, we also feature a report on the Kings River Fisher Project, conducted by scientists with the USFS Pacific Southwest Research Station on the Sierra NF.

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Kings River Fisher Project

Fishers are forest carnivores found primarily in areas with high canopy cover, large trees and snags, and abundant coarse woody debris. These same characteristics make a forest prone to high intensity wildfire, so an apparent conflict between fisher conservation and fuel management is a significant concern on many public lands throughout the Sierra Nevada region. In the SNFPA, a number of questions regarding fisher population status, viability, and habitat use were identified as priorities for monitoring. Elements such as distribution, reproduction, sources of mortality, and habitat selection were determined to be critical to understanding how fishers would be impacted by management activities such as fuel reduction and salvage logging. Specific information gaps identified include:

1. What are the habitat relationships of the fisher at the stand, home range, and landscape scales, particularly in relation to den sites? Do existing data on habitat relationships accurately represent habitat of fishers?
2. What are the reproduction and mortality rates of fishers and what environmental features are potentially influential?
3. What is the near-term effect of the timing, extent, and type of fire and fuel treatments on site occupancy by fisher?

Photo 1. A male fisher looks down from a rest site located in a stick nest.

To begin filling these information gaps, the USFS Pacific Southwest Research Station (PSW) and the Pacific Southwest Region initiated the Kings River Fisher Project (KRFP) in 2007. By combining research methods such as live capture, radio-telemetry, and scat detector dog surveys, the KRFP is providing extensive information on fisher ecology throughout the Kings River area. Additional techniques such as microsatellite genetic analysis, use of bioelectrical impedance to provide a measure of body condition, and detailed habitat sampling allow researchers to better understand how fishers are affected by their environment and predict how they would be impacted by forest management. Monitoring and research on the KRFP is conducted by Drs. Craig Thompson and Kathryn Purcell of the PSW.

2011 Monitoring results

In 2011, 16 fishers were captured and radio collared, bringing the five-year project total to 88 animals (50 females, 38 males). Home ranges averaged 1,113 ha (2,750 acres) for adult females and 4,522 ha (11,174 acres) for adult males. Eleven mortalities were collected (8 female, 3 male), bringing the project total to 35. In collaboration with UC Davis and the Integral Ecology Research Center, all carcasses collected are carefully examined and the animal's cause of death, as well as its exposure to various diseases and toxins over its lifetime, is determined.

Scat dog surveys were completed in June and October 2011; 620 scat samples were sent to the USFS Wildlife Genetics Lab for species identification, followed by individual identification for any confirmed as fisher. To date, 1617 scat samples have been sent in for genetic identification, and 68% of those have been successfully analyzed. Of those scats identified to species, 616 (56%) were confirmed as fisher.

Photo 2. Marvin, a scat detector dog from the University of Washington, searches a downed tree for fisher scat.

In 2011, twelve collared female fishers denned, but two appeared to fail within the first 2 weeks. This is the first time we have noted den failure. Although speculative, we think heavy snow the last week in March may have made it difficult for females to both forage and keep the kits warm. Overall, 18 kits were born to the 10 females whose litters survived long enough to be counted. Two kits died in early May, one from exposure and one from unknown causes.

Also in 2011, we initiated a more intensive examination of the impacts of anticoagulant rodenticides on fishers, which has recently arisen as an unexpected, regional concern. Funded by the USFS Western Wildlands Environmental Threat Assessment Center (http://www.fs.fed.us/wwetac/), we began conducting necropsies on archived fisher mortalities to determine the level of exposure to rodenticide. Twelve of 16 carcasses tested (75%) showed some degree of exposure. Sierra NF law enforcement personnel provided us with the locations of 131 illegal marijuana gardens located within our study area, and the High Sierra Trail Crew provided information on the amount and type of toxins found at each site. We are currently waiting on 6 additional necropsies before conducting an analysis on the relationship between individual exposure and the sites found within that animal's home range.

Technology transfer

Numerous presentations were given during 2011 at a variety of venues ranging from national conferences to local planning meetings. Topics included survival and causes of mortality, denning ecology, and habitat selection. One peer-reviewed publication, using landscape trajectory analysis to evaluate the potential risks of fuel treatments on fisher habitat, was published in the Journal of Wildlife Management (Thompson et al. 2011). We also hosted three field trips, instructing national forest prescribed fire and silviculture staff, as well as interested stakeholders, on how to identify fisher habitat and resting or denning structures.

We remain significantly involved in the Sierra NF Dinkey Collaborative, a 10-year effort to involve multiple stakeholders in the design and implementation of fuel management and ecological restoration projects on the Kings River landscape. Beyond simply attending meetings and providing information regarding fisher and other wildlife issues, we worked to identify

conservation mandates that conflicted with management objectives and to identify ways to move forward. In some cases, we conducted analyses and presented results, or we designed experiments to help fill key information gaps for managers.

Plans for 2012

This year will mark a turning point in the KRFP project: one fuel management project was recently completed within our study area, and two more are scheduled to begin in 2012. Monitoring in these areas will therefore shift from baseline collection to impact assessment. Information collected during and after these treatments will be reported back to the Dinkey Collaborative, allowing them to move forward in an adaptive management cycle.

Furthermore, an experimental prescribed fire is planned for spring 2012 to begin testing some of the assumptions upon which fisher conservation guidelines are based. To better evaluate the hazards posed by spring underburns, the Sierra NF will conduct a prescribed fire in an area historically used by denning fishers. Den cavities identified during previous seasons will be equipped with temperature and carbon monoxide sensors. Conditions inside the cavities during the fire will be evaluated to determine whether the environment would be dangerous to a fisher kit. Previous modeling has indicated that tree cavities are relatively protected from the effects of low intensity fires; however, this has yet to be tested in actual cavities where conditions can be affected by angled or multiple entrances, irregular insulation, or vents. Results of this experiment will help forest managers better predict the risk of spring vegetation management on young fishers.

Photo 3. An adult female fisher coaxes a kit out of a den cavity locating in a black oak. The photo was taken by a motion-activated camera aimed at the den entrance.

We will begin to address the importance of old growth forest connectivity and fragmentation to fisher survival and reproduction. Newly-acquired LiDAR data will help answer questions about forest heterogeneity and patch size. We will also begin synthesizing demographic information such as reproduction and survival in anticipation of the U.S. Fish and Wildlife Service plans to propose listing fishers under the Endangered Species Act in 2014.

Fisher and Marten Status and Trend Monitoring

This project, led by 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 (*Martes pennanti*) and American marten (*Martes americana*). Data are also routinely collected using the same survey techniques for a suite of other co-occurring carnivores,

including gray fox (*Urocyon cinereoargenteus*), bobcat (*Felis rufus*), ringtail (*Bassariscus astutus*), spotted skunk (*Spilogale gracilis*), striped skunk (*Mephitis mephitis*), black bear (*Ursus americanus*), and weasels (long-tailed and ermine; *Mustela spp*.).

Sampling is focused on the southern Sierra Nevada as the existing native fisher population is limited to this area. Each sample unit in the monitoring program is located on a modified version of the Forest Inventory and Analysis (FIA) sampling grid for the Sierra Nevada. This grid was developed by offsetting the FIA points from their true location by 100 m in a random direction. During 2002-2009, intensive population monitoring was conducted during what is now referred to as Phase I. This was the first year of full scale implementation of Phase II, which is a change from the intensive monitoring conducted during Phase I to a less intensive annual resample of the same sites.

Methods

Phase II uses a new protocol that takes advantage of recent technological advances by incorporating digital remote sensor cameras, while maximizing detection probability and compatibility with the Phase I data by retaining the track plate boxes that were the primary detection device during Phase I. In Phase II, each sample unit is composed of three stations that are a subset of the original six-station design used in Phase I (Figure 1). At each station two detection devices are deployed: a remote sensor camera and a track plate box offset ~100m from the camera in a random direction. Both devices are baited with chicken and a trapping lure and equipped with hair snaring devices to collect genetic samples. With the addition of cameras, we now have video clips of fisher at the sampling stations. All stations were checked three times with ~7 days between each check. Phase II sample units were previously surveyed during Phase I, such that resampling during Phase II will allow for the assessment of change in occupancy over time.

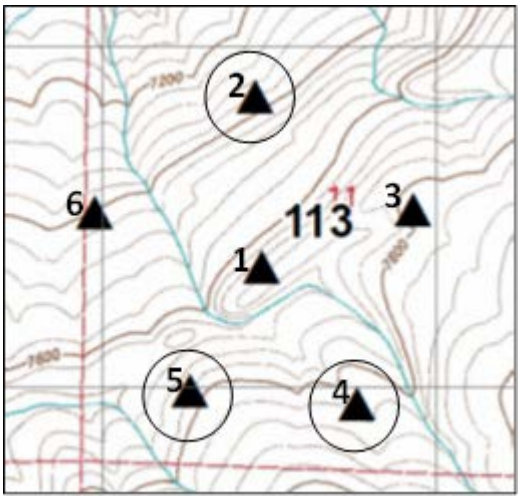

Figure 1. The site 113 sample unit design showing the 6 Phase I stations positioned 500 m from the center point (Station 1, located at the offset FIA point). The Phase II sampling design modifies this design by only sampling three of the six stations, equivalent to stations 2, 4, and 5 of the Phase I monitoring design (circled stations).

In 2011, units sampled in the southern Sierra were randomly selected from the 223 units that made up the core units of Phase I monitoring, excluding the units in the unoccupied zone on the Stanislaus National Forest or within Yosemite or Sequoia National Park, leaving a total of 201 available units for selection. In the northern Sierra, units were a resample of a selection of the units completed in this area from 2002-2004. Units in the northern Sierra Nevada (outside the range for southern Sierra fisher) were selected based on logistical considerations to maximize the number of units that could be completed in a 4-week survey period. The previous occupancy status of the units for either fisher or marten did not influence the selection process. Wilderness units were not sampled in 2011 due to logistical considerations, but we will resume sampling these units in 2012.

Accomplishments

The monitoring program completed 89 sample units in the southern Sierra fisher zone. Fishers were detected at 31 of these 89 units for a naive occupancy rate of 0.35 (Figure 2). An additional 25 units were completed in the northern Sierra Nevada to monitor marten populations. Marten were detected at 17 of the 89 units sampled in the southern Sierra and six of the 25 units in the northern Sierra (Figure 3).

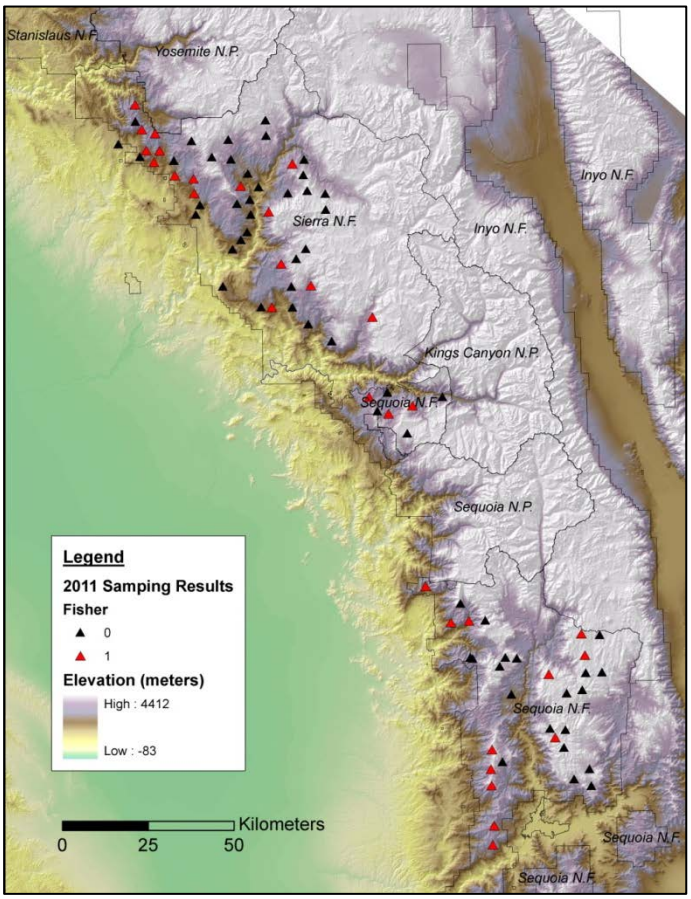

Figure 2. Map of the southern Sierra Nevada showing the location of units sampled and fisher detections in 2011. Black symbols indicate sampled sites where fisher were not detected and red symbols are sites where fisher were detected.

We collected 162 fisher hair samples from 24 different sample units and 90 marten hair samples from 15 different units. There was sufficient quantity and quality DNA in 73 fisher and 43 marten samples to genotype individuals. The genotypes detected represented 37 individual fishers (20 male, 17 female) and 27 individual marten (20 male, 7 female). Of the 37 individual fishers identified in 2011, four were recaptures from Phase I genetic sampling conducted 2006-2009. All of these recaptures were at the same sample units or adjacent to a previous capture location. This was the first year that marten samples have been genotyped to the individual level so there is no multi-year recapture data available for that species. To date there has been 160 individual fishers genotyped in the southern Sierra Nevada.

Plans for 2012

In 2012 we plan to continue with Phase II sampling, prioritizing completion of core monitoring units that were not completed in 2011. We will also resume sampling of wilderness sites. The 2011 data will be used to estimate detection probabilities for the cameras and track plates as designed in Phase II. This will allow us to further refine our sampling protocol, in terms of adjusting the number of stations, visits, or the survey duration, to maximize the number of units that can be sampled each year while retaining a high probability of detecting target animals.

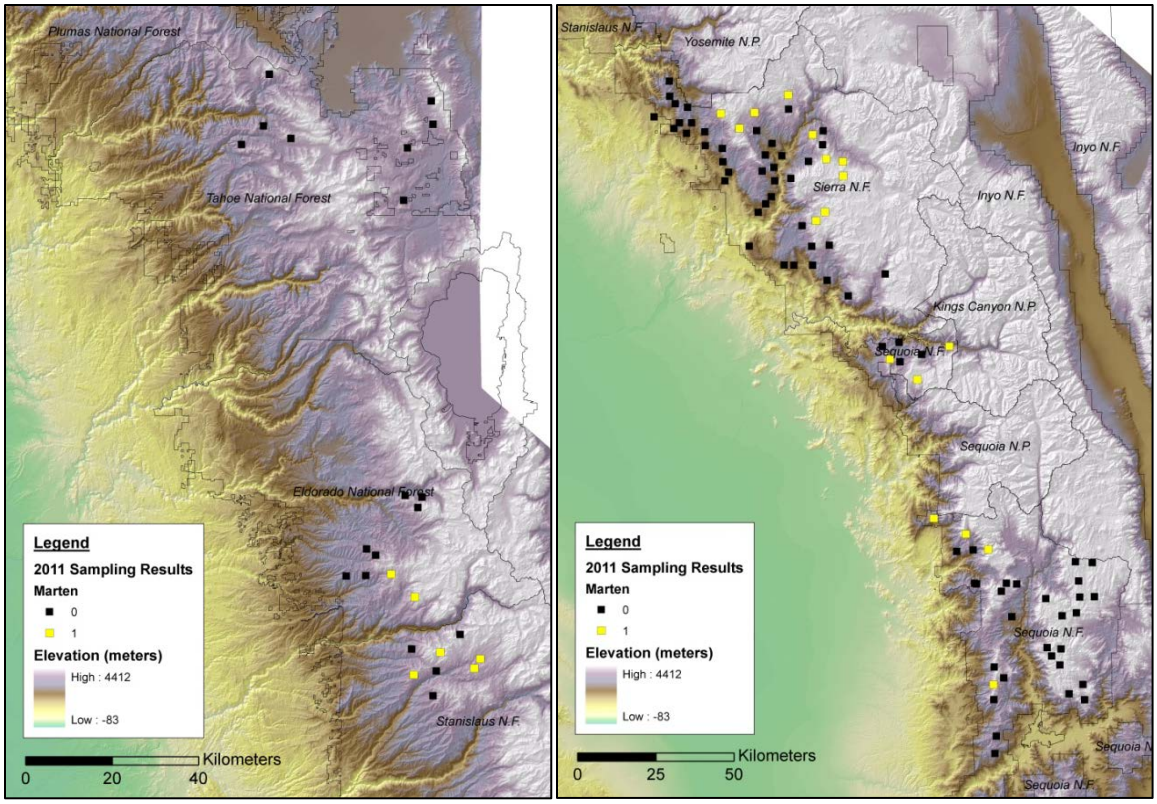

Figure 3. Maps of the northern (left) and southern (right) Sierra Nevada showing the location of units sampled and marten detections in 2011. Black symbols indicate sampled sites where marten were not detected and yellow symbols are sites where marten were detected.

A manuscript on results of Phase I fisher sampling is currently in revision, and further analyses of Phase I data are underway.

Amphibian Status and Trend Monitoring

In 2011, the amphibian monitoring program, led by Cathy Brown, focused on analysis and reporting of data from the first monitoring cycle (2002-2009). This long-term bioregional program monitors population status and trend for the mountain yellow-legged frog, Yosemite toad, and Sierran treefrog (Pacific chorus frog), which is a Management Indicator Species (MIS) for wet meadows on all SNFPA forests. In 2011, we finalized an internal report on amphibian status and continued work on several manuscripts that report results from the first monitoring cycle. We also continued analysis of data from the first cycle to evaluate habitat relationships of the three taxa for development of a technical report. For this report, we completed analyses examining correlative relationships between watershed scale occupancy, environmental, and management activity data. No further monitoring data were collected in 2011.

Population Monitoring Results (2002-2009)

Population status for the mountain yellow-legged frog, Yosemite toad, and Sierran treefrog was reported in the 2010 SNFPA report and restated here.

The mountain yellow-legged frog has declined in both distribution and abundance relative to historical data. Breeding occupancy was low in watersheds where the species had previously been found and relative abundances generally were low.

- Breeding was estimated to occur in 4% (se=0.7) of watersheds rangewide, 48% (se=4.1), of watersheds with known presence of frogs between 1990 and the beginning of the monitoring program (2002), and 3% (se=2.8) of watersheds with known presence of frogs only prior to 1990.
- An estimated 9% (se=5.2) of populations had large abundances (>100 frogs or >500 tadpoles) and few were as large as those reported in the literature.

The Yosemite toad was fairly widespread relative to recent distribution, but has declined from historical levels. Population abundances of adult males and egg masses in two watersheds were small.

Photo 4. Yosemite toad male calling during spring breeding chorus.

- Breeding was estimated to occur in 22% (se=1.2) of watersheds rangewide, 81% (se=3.4) of watersheds with known presence of toads between 1990 and the beginning of the monitoring program (2002), and 12% (se=3.5) of watersheds with known presence of toads only prior to 1990.
- In the two watersheds studied, adult male population abundances were generally less than 20 males and some meadows had very low abundances. Numbers of egg masses were similarly small.

The Sierran treefrog is relatively widespread in the Sierra Nevada. No abundance data were collected for this species. Breeding was found in an estimated 25% (se=0.6) of watersheds rangewide and 95% (se=1.6) of watersheds where the species likely occurred historically.

Watershed Scale Environmental Relationships

We examined the association between amphibian occurrence and watershed-scale environmental variables. These results emphasize the importance of available habitat, hydrology, and solar exposure, which is likely related to thermal regimes.

- Mountain yellow-legged frogs were associated with the presence of more than four lakes in the watershed, larger meadow area, southwest aspects (180^{o}- 270^{o}), cooler air temperatures, and lack of fish.
- Yosemite toads were associated with the presence of more than three meadows in the watershed, higher annual precipitation, and western aspects.
- Sierran treefrogs were associated with the area of lake and meadow habitat, elevation, and southwest aspects (135^{o}-315^{o}).

Guidance on Allocation of Survey Efforts

Two questions arise when planning field surveys:

1. When is the best time of the year to search for a species?
2. For how many years should surveys be conducted to determine whether a site is occupied?

These questions are particularly pertinent for ephemeral water breeders such as the Yosemite toad and Sierran treefrog. Adults and subadults of these species are not commonly found outside of spring breeding, whereas tadpoles are relatively easy to find if surveys are timed correctly. Their ephemeral breeding habitats dry out during the summer and tadpoles develop within a single season, often by early to mid-August. For these reasons, it is most efficient to survey for the tadpole life stage, but surveys must be conducted early enough in the season, before sites dry up or tadpoles metamorphose and disperse from breeding areas. A second consideration is that these species may not breed at a given site (lake, meadow, stream) every year (i.e., they may skip years) so that multiple years of surveys may be needed to confirm their presence or absence. Although still pertinent, there is more leeway for mountain yellow-legged frogs. These species have a multi-year tadpole stage and breed in perennial waters. Therefore, surveys can be conducted at any time during a summer, and in healthy populations, presence of tadpoles should be consistent from year to year.

From this monitoring, we can provide guidance on when to conduct surveys within a summer to increase the probability of finding tadpoles of Yosemite toad and Sierran treefrog (Figure 4). For both species during average and wet water years, surveys should be conducted by about mid-August. In drier years, surveys should be conducted earlier.

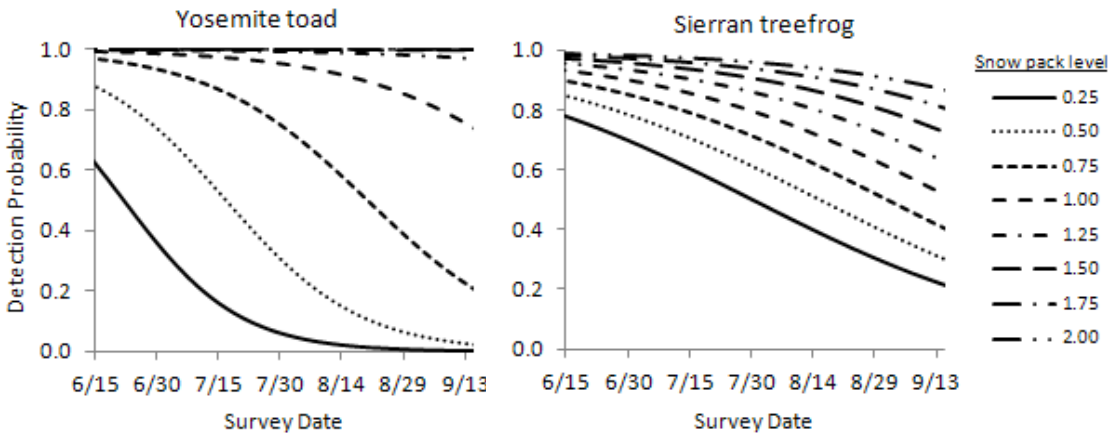

Figure 4. Probability of detection for Yosemite toads (left) and Sierran treefrogs (right) for different survey dates and snow pack levels. Snow pack levels are the percent of the 30-year average; thus, the 1.00 line represents average snow pack.

In figure 5, we provide guidance on how many consecutive years to survey to increase the probability of finding tadpoles if they are present. Results were similar for all three taxa. There is

about a 50% chance of finding the species with one year of survey, and that increases to 70-80% chance with three consecutive years of survey.

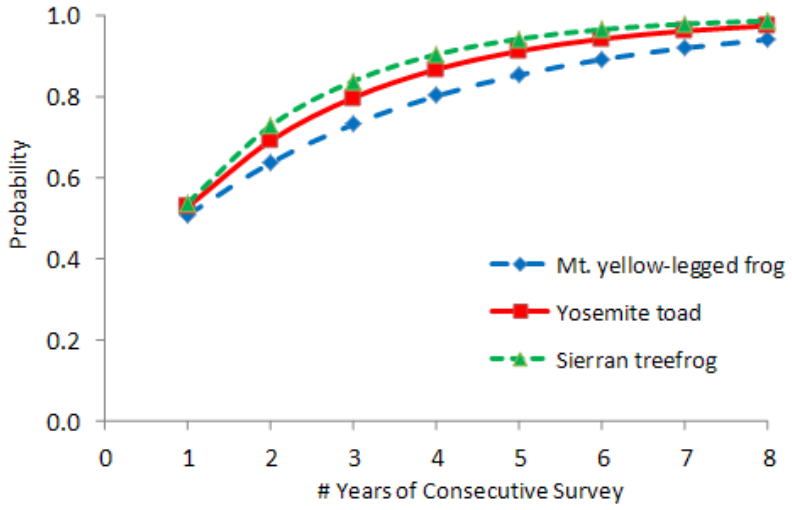

Figure 5. The probability of finding breeding at a site, given that the species breeds at the site, by number of years of consecutive survey for the mountain yellow-legged frog, Yosemite toad, and Sierran treefrog.

Plans for 2012

The program of work for 2012 includes completion of the technical report, including peer reviews, for possible publication as a General Technical Report (GTR) and field surveys for the management indicator species, the Sierran treefrog.

California Spotted Owl in the Eldorado Study Area

Long-term monitoring of California spotted owls (*Strix occidentalis occidentalis*) on the Eldorado NF in the central Sierra Nevada is conducted by Drs. 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 population studies (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 activities of owls on the Eldorado NF. We continued to participate in the Sierra Nevada Adaptive Management Project (SNAMP), which is assessing the ecological and social impacts of "strategically placed area treatments" (SPLATs) conducted under the 2004 SNFPA (http://snamp.cnr.berkeley.edu/).

Management Applications

By agreement with the SNAMP Science Team and MOU partners, we are bound by a neutrality agreement, which precludes us from providing specific advice on forest management. However, there have been many management implications from our study over the years. Our monitoring in 2011 provided evidence for a long-term decline in reproduction and population rate of change (Peery et al. 2012). These findings suggest prudent management when considering

potential impacts to owls. Our work with SNAMP and the next meta-analysis should provide more insight to the factors correlated with these declines.

Our past studies (see http://fwcb.cfans.umn.edu/research/owls/) on habitat conditions associated with spotted owls have provided USFS managers with information that can guide silvicultural prescriptions. We have been working during the past year to update and refine a habitat map for our study area that incorporates annual changes in vegetation conditions, primarily due to timber harvests. This map will supplement a map being developed by Carlos Ramirez (USFS Remote Sensing Lab, Region 5) for an upcoming meta-analysis that will assess how habitat change may affect spotted owl population parameters such as reproduction, survival, and site occupancy. These efforts will build upon our past analysis that examined the impact of habitat change on spotted owl site occupancy (Seamans and Gutiérrez 2007).

We published a paper on spotted owl home range and foraging habitat selection using radio-telemetry data collected during an experimental study on the short-term effects of fuels treatments on owl habitat use (Williams et al. 2011). As expected, owls selected mature conifer forest at the home range scale, but foraging owls also selected pole-sized conifer forest. Thus, some level of landscape heterogeneity (e.g., due to fuels treatments) may benefit owls, but ultimately these changes should be related to measures of owl fitness, which will be addressed in the upcoming meta-analysis.

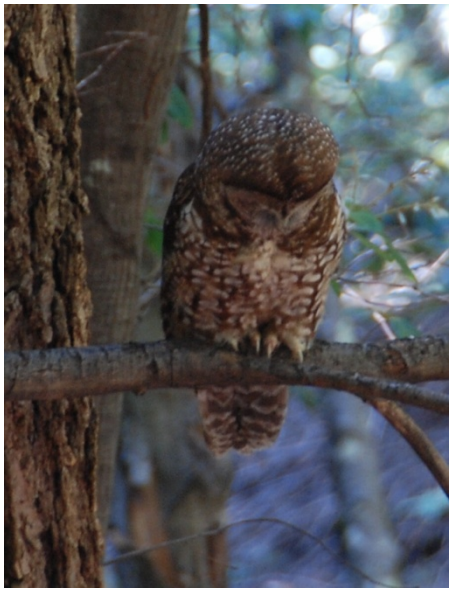

Photo 5. California spotted owl peering down from a branch.

We also published a paper that demonstrated how airborne light detection and ranging (LiDAR) data can benefit spotted owl habitat mapping efforts (García-Feced et al. 2011). Specifically, we showed that LiDAR can identify individual large trees over large spatial scales. Large trees are an important component of owl nesting habitat. We recommend that managers consider using LiDAR in future studies and for management of owl habitat when the acquisition of such data is economically feasible.

Our paper on using long-term nest and roost site locations to examine the efficacy of the Protected Activity Center (PAC) was accepted for publication (Berigan et al., in press). This analysis demonstrated that PACs have effectively protected core areas of owl use over long time periods, and thus, we recommend their continued use for owl management.

Technology Transfer

Our 2011 technology transfer activities included one workshop and two field trips. On February 24, we participated in a daylong workshop to update USFS biologists and others in the agency on our historical and more recent findings. At this workshop our entire staff made presentations. We also answered questions from biologists. On June 29, we guided USFS

employees on a walk-in owl survey near Blodgett Forest Research Station. On July 14, we led a SNAMP field trip on another walk-in survey near Sugar Pine Reservoir on the Tahoe NF that was attended by members of the general public and federal and state agency personnel. During these field trips, we showed the attendees how we survey for owls, resight banded owls, and assess owl reproduction. We also discussed the long-term goals of our demographic study and reviewed some of our findings. We maintain R.J. Gutiérrez's website on spotted owl research (http://fwcb.cfans.umn.edu/research/owls/), which contains links to .pdf files for many of the papers we have published over our 30 years of owl work.

Plans for 2012

We will continue monitoring owls for reproduction, survival, and site occupancy from April-August 2012. We will continue delineating vegetation polygons on our historic habitat map and will assess map accuracy by visiting randomly sampled locations on our study areas.

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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, 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 on water, wildlife, fire, forest health, and public participation on a fireshed scale using an adaptive management framework, innovative research, and stakeholder participation. The project maintains a website that is frequently updated with results of the monitoring they do.

Management Indicator Species

The second Sierra Nevada Forests Bioregional Management Indicator Species (MIS) Report was completed in December, 2010. The report is a regularly updated summary of the status and trend of MIS for 10 National Forest units in the Sierra Nevada (Eldorado, Inyo, Lassen, Modoc, Plumas, Sequoia, Sierra, Stanislaus, and Tahoe National Forests and the Lake Tahoe Basin Management Unit) and serves as the primary tool to track and report the results of bioregional MIS monitoring.

During the period from the early 2000s to the mid-to-late 2000s, habitat changes observed previously (early 1990s to early 2000s) in coniferous forest types have continued:

- A slight increase in closed-canopy, late-seral coniferous forest, with a corresponding decrease in open-canopy, late-seral coniferous forest.
- An increase in mid-seral coniferous forest, with a corresponding decrease in early-seral coniferous forest.

Trends in snags per acre and fire burn severity were also reported. Distribution population monitoring is reported in individual species accounts for the 12 terrestrial species and aquatic macroinvertebrates.

The report, which provides details about methods and current results, is available now from Diana Craig (dcraig01@fs.fed.us).

In addition, monitoring results for the annual monitoring of MIS birds, including results from the 2011 field season, are available on-line:

> http://data.prbo.org/partners/usfs/snmis/ (fox sparrow, hairy woodpecker, mountain quail, and yellow warbler)
>
> http://www.birdpop.org/Sierra/bbwo_results.htm (black-backed woodpecker)

Forest Monitoring Summary

October 1, 2010 to September 30, 2011 (FY 2011)

This summary is based on reports from the nine California national forests and the Lake Tahoe Basin Management Unit (LTBMU). Nearly all Sierra Nevada NFs in California have completed FACTS (Forest Activity Tracking System) data base entry for projects through FY11. The forests (except Modoc NF) conduct landscape-level assessments in designing most fuel treatments.

Fuel treatments in California spotted owl (CSO) and northern goshawk Protected Activity Centers (PACs) and in the wildland urban interface (WUI) during FY11 are summarized in Table 1. Treated acres represent much less than 0.1% of CSO PACs and less than 0.5% of goshawk PACs. Virtually no treatments were conducted in CSO PACs during 2011 and acres of treatments in goshawk PACs were about one-fourth of the 2010 treatments. After careful review of the databases, we are confident that these treatment acreages are accurate. Total acres of fuel treatments have been declining over the past several years, and forests can avoid treatments in PACs because their boundaries are now well-established and stable.

Table 1. Summary of fuel treatments in California Spotted Owl and Northern Goshawk PACs and WUI for 2011.

Forest	Treatment Acres in California Spotted Owl PAC*	Treatment Acres in Goshawk PAC *	Acres treated in WUI	Percent of total treated in WUI
Eldorado	0	81	2,655	23
Inyo	0	0	1,121	35
Lake Tahoe Basin	0	27	6,675	97
Lassen	3	0	5,033	30
Modoc	0	0	2,251	38
Plumas	0	2	5,308	57
Sequoia	0	0	5,055	19
Sierra	<1	379	4,951	74
Stanislaus	0	2	4,177	67
Tahoe	2	3	2,958	64
TOTAL	5	494	40,183	45

* Data pulled from FACTS June, 2012

In 2011, fuel treatments were conducted on 98,151 acres on the Region 5 Sierra Nevada National Forests. Of those acres, 45% 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.

Treatments within California spotted owl PACs have occurred on eight of the National Forests in the Sierra Nevada bioregion since 2004:

- 2,069 acres on the Eldorado NF,
- 944 acres on the Lake Tahoe Basin Management Unit,
- 140 acres on the Lassen NF,
- 591 acres on the Plumas NF,
- 1,593 acres on the Sequoia NF,
- 3,920 acres on the Sierra NF,
- 2,713 acres on the Stanislaus NF, and

- 523 acres on the Tahoe NF.

The total of 12,493 acres treated within CSO PACs since 2004 is less than 3% of the 421,780 acres of CSO PACs designated within the Sierra Nevada. The ROD for SNFPA limits vegetation treatments to no more than 5% of the acres in CSO PACs per year and 10% per decade (page 61).

A number of treatments have been conducted in Northern goshawk PACs since 2004:

- 678 acres on the Eldorado NF,
- 200 acres on the Humboldt-Toiyabe NF (but reporting is incomplete),
- 3 acres on the Inyo NF,
- 186 acres on Lake Tahoe Basin Management Unit,
- 917 acres on the Lassen NF,
- 1,684 acres on the Modoc NF,
- 313 acres on the Plumas NF,
- 215 acres on the Sequoia NF,
- 749 acres on the Sierra NF,
- 764 acres on the Stanislaus NF, and
- 548 acres on the Tahoe NF.

The total of 6,257 acres treated in goshawk PACs since 2004 is less than 6% of the approximately 108,158 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 CSO 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 2010, there were no CSO PACs affected by stand-replacing fires.

The Sierra Nevada national forests identified fuels treatments in Great Grey Owl PACs and fisher den site buffers; none in marten den site buffers:

- Sierra NF treated acres in Great Grey Owl PACs as follows:
    - Swanson Meadow PAC – 33 acres
    - Clover Meadow PAC – 38 acres
    - Forked Meadow PAC -- 37 acres
    - Sonny North PAC -- 20 acres
- Sierra NF also treated 8 acres in a 700-acre fisher den buffer.

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

Forests used the flexibility in S&G #71 to change CSO and goshawk PAC boundaries to implement projects during 2011:

- Sequoia NF modified CSO PACs are described in table2.

Table 2. Modifications to CSO PACs on the Sequoia NF. Table values are acres. Moderate acres are 40-59% canopy cover and dense acres are >60% canopy cover, representing moderate and highly suitable mature forest habitat, size classes 4 and 5 (>11 " dbh).

CSO PAC	New PAC Moderate	New PAC Dense	New PAC Other	New PAC Total	Old PAC Moderate	Old PAC Dense	Old PAC Other	Old PAC Total
KE004	10	324	34	368	8	310	325	659
KE005	51	408	187	646	29	315	125	469
KE025	74	278	91	443	5	249	38	292
KE028	275	172	125	572	8	231	61	300
KE034	44	375	68	487	29	176	128	333
KE036	31	361	76	468	15	244	49	308

- Stanislaus NF modified PAC boundaries (30 acres) in TUO0149 (Cottonwood Creek) for a fuel break treatment in the WUI that would render habitat unsuitable; PAC retains 304 acres.

Implementation monitoring was conducted on projects during 2011 as follows:

- Eldorado NF reports no monitoring was done for SNFPA wildlife. Emphasis for monitoring this year was travel management -- 42 routes that cross or border 124 meadows were surveyed and monitored for road effects to hydrologic function and compliance with S&G #100 of the SNFPA ROD.

- Inyo NF reports that some level of implementation monitoring was conducted for the majority of projects (approximately 75-100%) in 2011.

- Lassen NF conducts monitoring on 89% of projects, but not SNFPA implementation monitoring because it continues to operate under the Herger-Feinstein Quincy Library Group (HFQLG) Act. Monitoring for HFQLG is reported at http://www.fs.fed.us/r5/hfqlg/monitoring/.

- Lake Tahoe Basin Management Unit (100% of projects were monitored) provides a summary of its entire monitoring program in an annual report http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5348784.pdf.

- Modoc NF reports soils monitoring on 7% of total projects; all vegetation management projects were monitored for vegetation prescription compliance.

- Plumas NF conducts monitoring on 50% of projects; like the Lassen NF, the Plumas does not do SNFPA implementation monitoring because it continues to operate under the HFQLG Act. Monitoring for HFQL is reported at http://www.fs.fed.us/r5/hfqlg/monitoring/.

- Sierra NF conducted monitoring on all projects

- Sequoia NF did not report monitoring for 2011.
- Stanislaus NF reports monitoring for 20% of projects.
- Tahoe NF conducted monitoring on 95% of projects.

Forest Relations with Tribes

The Sierra 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 2011 include:

Inyo NF

The Inyo NF worked to ensure appropriate access to sacred and ceremonial sites and to tribal traditional use areas:

- Collaborated with the Regional and National Tribal Relations Program to present a Sacred Sites Forum to local tribes and to conduct formal consultation on sacred sites policy.
- Considered and addressed traditional use areas and access to pinyon pine nut gathering areas in its implementation of the 2009 Travel Management Record of Decision.

In consultation with appropriate tribal communities on fire protection and fuels management activities, the Inyo NF engaged local tribes in fuelwood gathering planning for 17 new fuels management and fire protection activities.

Lassen NF

- Heritage Resource personnel and other forest staff and line officers maintain continuous relationships with local Tribes (Pit River Tribe and Susanville Rancheria), including quarterly meetings to coordinate planning efforts. This year, the Forest also entered into ongoing consultation with the Redding Rancheria.
- The Forest continues to maintain access and facilitates tribal use of sacred and ceremonial sites, including continued free special use permits for the Honey Lake Maidu to hold their annual Bear Dance Ceremony at Roxie Peconom Campground.
- The forest is working with the tribes, law enforcement, and other personnel on protecting areas of Tribal concern. All culturally significant areas are managed confidentially.

- In the summer of 2011, Youth Crews from the Susanville Rancheria helped with placement of signs indicating new motorized trails added to our transportation system as a result of the Travel Management Decision.

Lake Tahoe Basin Management Unit

- Initiated an agreement for the coordinated management of Washoe Tribal and Forest Service land at Skunk Harbor on the East Shore of Lake Tahoe.
- Developed the Washoe Tending Garden at the Tallac Historic site for the Washoe Tribe to tend and educate the public about traditional plant uses.
- Facilitated the traditional use of Cave Rock, a Traditional Cultural Property by traditional practitioners

Modoc NF

Modoc NF continues to consult with the Pit River Tribe and involve the Klamath Tribes in project planning within traditional lands. Currently, the Modoc NF is sharing a Tribal Liaison with the Plumas NF.

Plumas NF

- Drafted a Master Participating Agreement with the Estom Yumeka Tribe of Enterprise Rancheria, which is currently being reviewed by the Tribe.
- Engaged a local Mountain Maidu woman to be key speaker for two Women's History Month events.
- Consulted with Tribes and collaborated with local Mountain Maidu People to take protective measures for a sensitive cultural site near the Quincy Roundhouses.
- Coordinated with the Natural Resources Conservation Service (NRCS) to utilize Forest video conferencing to hold various information sharing and collaborative meetings with tribal organizations.
- Collaborated with the Lassen, Shasta Trinity, Tahoe, Mendocino, and Modoc NFs and the LTBMU to consolidate letters to Tribes on national-level topics to reduce redundancy letters to the Tribes in response to tribal comments.

Sequoia NF

Sequoia NF held quarterly Tribal Forum meetings. In 2011, a number of important topics were discussed:

- Giant Sequoia National Monument Plan
- National Forest Planning Rule Process
- Draft Indian Sacred Sites Report to the Secretary of Agriculture
- Collaborative Landscape Restoration Projects, particularly the Sawmill Ridge Restoration Project and Rancheria Collaborative project

Sierra NF

Sierra NF held quarterly Tribal Forum meetings. In 2011, a number of important topics were discussed:

- National Forest Planning Rule Process
- Draft Indian Sacred Sites Report to the Secretary of Agriculture
- Collaborative Landscape Restoration Projects

The Dinkey Landscape Restoration Project (DLRP), Willow Creek Planning Project, and Sustainable Forest Community Collaborative (SFCC) work to ensure Tribal traditional cultural knowledge is incorporated within the core values and beliefs of each collaboration effort. Ron Goode, Tribal Chairman of the North Fork Mono Tribe; Chairman Ron Alec, Spiritual Leader for the Haslett Basin Traditional Committee (HBTC); and Robert Marquez, Tribal Chairman of the Cold Springs Rancheria jointly delivered a presentation on "Cultural Resources from a Tribal Perspective" to the Dinkey LRP collaborative group. The Dinkey LRP Collaborative group also took a field trip to the Haslett Basin Bear Dance area.

Stanislaus NF

- The Stanislaus National Forest has been working on with the Tuolumne Band of Me-Wuk and the Southern Sierra Miwuk Nation to secure the rim of Bower Cave, a sacred location to both tribes. A gate was designed by the Sierra Miwuk Nation and was installed in 2011.
- In 2011, all-Native crews from the Tuolumne Band of Me-Wuk and the Calaveras Band of Miwuk worked to restore an important cultural meadow. The meadow is the site of a large village. After a fire in the late 1990s, conifers have invaded the meadow, depleting the water table, choking out the black oak, and damaging village features. The Native crews enhanced the meadow habitat and water sequestration by removing the conifers and protected spring sources, native plants, and cultural resources by building a fence.

- Sierran Passport In Time, a Sierran Footsteps cultural workshop, was offered to the public in partnership with the California Indian cultural practitioners and the California Indian Basketweavers Association (CIBA). The workshop was made possible with Region 5 Section 110 funding (NHPA). Held July 8-11, the four days of cultural immersion, hands-on activities and camp life steeped in Me-Wuk traditions transformed the participants to a greater understanding of pre-Gold Rush California Indian lifeways.