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Sierra Nevada Forest Plan Accomplishment Monitoring Report For 2004

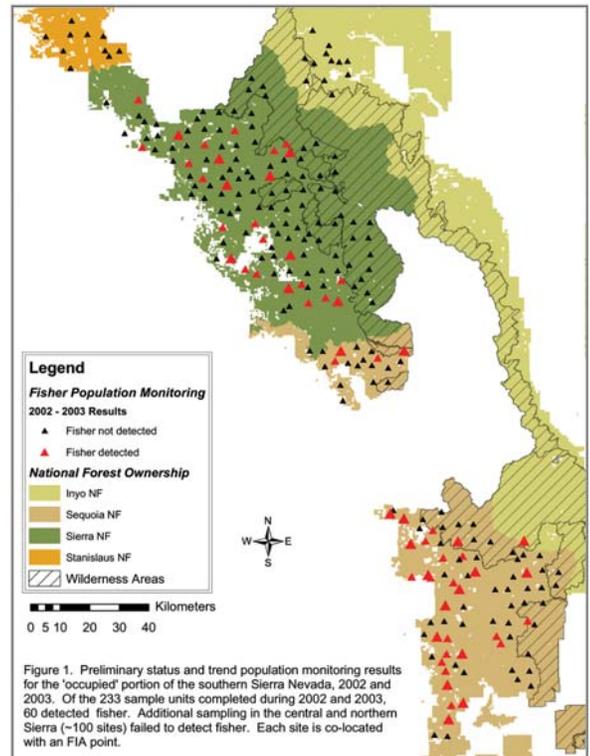
Sierra Nevada Forest Plan Implementation

In 2004 the Forest Service in California continued several long term monitoring studies of significant wildlife species, ecosystems and processes in the Sierra Nevada mountain range. The long term monitoring is focused on developing scientifically valid assessments of the status of several species, ecosystems and processes and how those species, ecosystems and processes may be affected over time under management direction in the Sierra Nevada Forest Plan Amendment Record of Decision. A summary of forest monitoring is included.

Pacific Fisher and American Marten Status and Trend Monitoring

Status and trend monitoring for Pacific fisher (*Martes pennanti*) and American marten (*M. americana*) began in 2002. The basic monitoring objective for each species is the same: to detect 20% declines in population abundance and habitat across the Sierra Nevada. Monitoring strategies for each species differ slightly due to differences in the current distribution of each species. Fisher are limited in distribution to the southern portion of the Sierra Nevada mountain range. Monitoring involves two components: intensive sampling on Sierra and Sequoia National Forests designed to monitor population trend; and less intensive sampling at sites in the central and northern Sierra Nevada focused on finding any expansion of the fisher population.

Marten seem to be distributed throughout their historic range in the Sierra Nevada, and monitoring occurs on all forests throughout the Sierra Nevada though at slightly higher elevations than for fisher. For both species, population monitoring involves conducting presence/absence surveys throughout the bioregion to estimate the proportion of sites (primary sample units) annually occupied by fisher and marten, and detect declines over the proposed ten year monitoring period.



Each primary sample unit includes an array of five or six track plate stations and one remote camera station that is surveyed for ten consecutive days. Sample units are co-located with Forest Inventory and Analysis plots. Tracks and photographs of species visiting each sample unit are collected every two days. Each species is considered present at the primary sample unit if it is detected at one or more station during the ten day survey. Habitat monitoring relies on tracking changes in habitat quality using a combination of remotely-sensed vegetation data

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**Forest Monitoring
Summary for
October 1, 2003 to
September 30, 2004
(FY 2004)**

Treatments in California Spotted Owl (CSO) Protected Activity Centers (PACs) in 2004 were: one acre on the Lake Tahoe Basin Management Unit (LTBMU), four acres on the Sequoia National Forest (NF) and 430 acres on the Eldorado NF. The Record of Decision (ROD) for the Sierra Nevada Forest Plan Amendment (SNFPA) Final Supplemental Environmental Impact Statement (FSEIS) limits vegetation treatments to no more than 5% of the acres in CSO PACS per year. 435 acres equals .1% of the estimated 421,780 acres identified in the FSEIS (page 146).

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Treatments in Northern Goshawk PACs in 2004 were: 36 acres on the LTBMU and 76 acres on the Eldorado NF. The ROD for SNFPA limits vegetation treatments to no more than 5% of acres in Northern Goshawk PACS per year (page 61). 112 acres equals .04% of

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and plot data collected in conjunction with the on-going Forest Inventory and Analysis program.

Accomplishments

During the past three field seasons, 554 primary sample units have been completed (with more than 3,500 individual survey stations and over 35,000 survey nights). Sampling effort has been greater on the Sequoia and Sierra National Forests (385 sample units) than in the central and northern Sierra Nevada (169 sample units). In the southern Sierra Nevada, fishers were detected at 95 sample units.

Marten were detected at 71 sites throughout the region, 24 of which occurred in wilderness areas. The proportion of sample units with detections for fisher, marten and select associated carnivores during the first three years of the monitoring program is described in the table below.

The proportions are estimated as number of sites with detection divided by the number of sites surveyed. In the future, they will be adjusted based on species' detectability, possibly resulting in annual estimates being higher than the preliminary estimates reported here. Annual estimates will be ultimately used to monitor trend.

Fisher were generally detected at lower elevations (average = 6,083 feet, 95 percent Confidence Interval ranging from 5,845 feet to 6,320 feet) than marten (average = 7,572 feet, 95 percent Confidence Interval ranging from 7,298 feet to 9,793 feet), but elevation ranges of the two species overlapped somewhat. Fisher were detected as low as

3,110 feet and as high as 8,291 feet; marten detections ranged from 4,400 feet to 9,793 feet. Preliminary results indicate that fisher are well-distributed in portions of the Sequoia and Sierra National Forests (map on front page). Comparisons to survey data from the 1990s suggest that the extent of occurrence for fisher may have expanded in the southern Sierra during the past ten years. Fisher were not detected in the central and northern Sierra Nevada where more than 100 sites were sampled. Marten were detected sporadically throughout the central and southern Sierra Nevada (including the Inyo NF in the Mammoth Lakes area), though relatively few detections were recorded in the northern Sierra Nevada.

Continued monitoring will be critical to document fisher population expansion into the central and northern Sierra Nevada as well as to better understand regional variation in marten distribution. Program objectives for 2005 include: (1) continued intensive sampling of the fisher population in the southern Sierra, (2) sampling for fisher in the central and northern Sierra Nevada with emphasis on the Stanislaus and Lassen National Forests, (3) continued marten monitoring, and (4) migration of all data to Forest Service corporate databases and subsequent release of data to the general public. Other objectives include additional sampling on southern Stanislaus NF, northern Sierra NF, and Yosemite National Park to establish with greater precision the northern extent of the fisher population.

	Proportion of Primary Sample Units Detecting:				
Year	<i>Fisher</i>	<i>Marten</i>	<i>Gray Fox</i>	<i>Ringtail</i>	<i>Spotted Skunk</i>
2002	0.268	0.176	0.205	0.087	0.199
2003	0.234	0.167	0.162	0.084	0.126
2004	0.238	0.144	0.139	0.089	0.178

Air Quality Monitoring

Air quality in parts of the Sierra Nevada mountain range is among the poorest in the nation due to air pollution from other areas of California. Air pollution is increasingly having an impact on forest ecosystems. The Forest Service is monitoring air quality in the Sierra Nevada and measuring surface water chemistry, visibility, ozone injury to vegetation, and smoke from prescribed and wildland fire.

Accomplishments

In 2004 efforts focused on continuing to analyze the water chemistry in Class I wilderness lakes selected for long term sampling. These lakes were selected in 2003 after a broad sampling of lakes that were predicted to be sensitive to air pollutants through a modeling effort.

Surface water chemistry

Sampling was completed during 2004 at lakes targeted for their sensitivity to acidic pollution in the Kaiser, Desolation, Emigrant, South Warner, Caribou, Thousand Lakes, and Mokelumne Wildernesses. The water samples from the wilderness lakes were analyzed at the Rocky Mountain Research Station laboratory. The data from the samples was reviewed by the Regional Air Program staff and Pacific Southwest Research Station scientists then entered into the Natural Resource Information System data base. In addition, a broad sampling of approximately 30 lakes predicted to be sensitive in the Ansel



Sampling at Key Lake In the Emigrant Wilderness

Adams wilderness was completed. The data will be used to select one or two lakes for the long term monitoring program.

Smoke monitoring

In 2004 the smoke monitoring pilot that was initiated with fixed and portable equipment on the Sequoia National Forest was extended to include sites on the Sierra, Stanislaus, and Inyo National Forests. Real-time data is transmitted via satellite for immediate management use and the data, after quality assurance review, is archived by the Regional Air Program. The 2004 data proved very useful during wildland fire use events in the southern Sierra Nevada and was effective in performing retrospective analysis of fire use projects and the Deep Fire on the Sequoia National Forest.



Portable smoke monitor at Camp Nelson on the Sequoia NF

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the estimated 264,200 acres derived from 1,321 PACS equaling 200 acres each.

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Treatment in fisher den site buffers occurred on 40 acres on the Sequoia NF. Treatment within fisher den site buffers may occur if necessary to achieve fuel objectives in the urban wildland inter-mix zone (ROD page 61).

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None of the Sierra Nevada Forests identified any vegetation management treatments in Great Grey Owl PACs, or marten den site buffers though the ROD allows some vegetation treatments (pages 61-62).

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The ROD requires evaluation of CSO PACS after potentially stand replacing fires in order to replace PACS which may have become unsuitable (page 37). Only one CSO PAC was affected by wild-fire in 2003 and no acres became unsuitable as a result of the fire. The fire was located on the Stanislaus National Forest.

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Almost two-thirds of the forests were either current or closing on accomplishment of FACTS data base entry for FY 2004 projects including: the Eldorado NF, the LTBMU, the Sequoia NF, the Sierra NF, and the Modoc NF. Other forests, such as the Plumas NF, the Tahoe NF and the Stanislaus NF expected to complete the task during winter of 2005. Still other forests have longer term plans to accomplish data base entry for FY 2004 data such as the Lassen by June 2006. The ROD requires each forest to begin using FACTS in 2004 (page 12).

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The ROD requires landscape level design of area treatment patterns prior to project level analysis for fuel treatment (page 49). Most forests began landscape analyses including the Eldorado NF, the LTBMU, the Modoc NF, the Stanislaus NF, the Sequoia NF and the Tahoe NF. The fuel treatment strategy for the Lassen NF and Plumas NF is part of the Herger-Feinstein Quincy Library Group (HFQLG) Forest Recovery Act pilot project however and will provide an opportunity to compare the effectiveness of two different strategies (page 66-68).

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Fire Severity Monitoring

This study is designed to quantitatively assess current fire regimes using existing data and fire severity mapping. This is done by quantifying information on the following fire regime attributes: season of fire occurrence, frequency, fire size, fire severity, and spatial complexity (the pattern of severity). This process uses satellite imagery to create fire severity maps that show the size and severity of fires since 1984 and for a ten year period into the future starting in 2002. This will provide quantitative data on current fire regimes and will directly address the question about whether fires are getting larger and more severe. In addition, the fire severity maps can be used to measure the effectiveness of fuel treatments at a landscape scale through correlations of fire severity and fuels treatments. This study is designed to answer the questions about fire severity in the Sierra Nevada bioregion and guide choices for managing fire effects on the landscape.

Accomplishments

At the end of FY 2004, the Fire Severity and Fuel Monitoring Program in collaboration with the National Park Service/United States Geological Service Burn Severity Mapping Project has collected field data for 22 fires. This includes 1,034 plots on National Forest system lands and 198 plots on National Park lands for a total of 1,232 field plots. Field data is placed on a computer data base electronically in the field for later transfer to the main data base.

Fire severity maps have been created for fires larger than 1,000 acres in the Sierra Nevada for 2001, 2002 and 2003. Twenty years of satellite imagery for the areas of Yosemite National Park and adjacent to Lake Tahoe are being analyzed so the current fire regimes for at least four vegetation types can be classified. All the fire severity maps for these areas have been produced for the last 20 years.

In addition, the study team leader is cooperating with the National Burn Severity Workgroup on a national proposal to map fire severity.



Vegetation regrowth one year after fire

Forest-Community Collaborations

All forests worked at increasing the level of community collaboration following direction in the ROD (page 25). Highlights from across the Sierra Nevada range include:

- A Fireshed Assessment workshop was held on the Eldorado NF that included environmental organizations, industry representatives, County and other local government entities and Forest Service personnel.
- Meetings with Mariposa County Supervisors about a five year integrated Vegetation Management Strategy to implement the Healthy Forest Restoration Act and the SNFPA took place with the Groveland District Ranger on the Stanislaus NF.
- Truckee Ranger District successfully helped the University of California at Berkeley apply for a Joint Fire Science Program grant to assist the Tahoe NF in development of a fuel treatment plan for the Sagehen Basin. The involvement of the University of California will result in a variety of monitoring and research efforts on effects and effectiveness of the Strategic area placement of fuel treatments.
- A new community group in an unincorporated area in Modoc County is developing to work with the Forest and district on planning further fuel treatments within the vicinity of that residential area.
- The Hume Lake Ranger District on the Sequoia NF collaborated with the Tulare County Fire Safe Council, the Hartland Christian Camp and the communities of Hartland, Pinehurst, Sequoia Lake and Hume Lake on National Fire Plan grants for fuels reduction and fuels planning.
- The Plumas NF has added a small hand thinning project next to the Blackhawk subdivision along Highway 70 next to private residences, to assist adjacent private landowners in obtaining grant funding for fuel treatments on private property for a fire safe landscape on both sides of property lines.
- Three meetings were held with stakeholders in Mariposa and Madera counties including county government, fire department representatives, tribal representatives, and Firesafe Councils by Bass Lake Ranger District for collaborative fuel planning.
- Workshops for Stewardship contracting for fuel reduction projects were held on the Eldorado NF.
- A comprehensive community wildfire protection plan was completed with assistance from the Sequoia National Forest for the Alta Sierra Community.
- Field trips with forest industry, California Division of Forestry, California Forestry Association and private landowners to improve working relationships and develop a common understanding of effective fuel treatments occurred on the Eldorado NF during the last year.
- An open field trip with Board of Supervisors representatives, press and local stake holders regarding guidelines and implementation of the Sonny Meadows project being prepared under the 2004 SNFPA ROD was led by Bass Lake Ranger District. The sale was subsequently prepared and sold without any appeals.
- Development of fuel treatment standards with the Pinecrest Permittees' Fire Safe Council for Pinecrest recreational residences has now been applied to all recreational residences on Pinecrest District of the Stanislaus NF.
- Three of the four districts on the Tahoe NF are very active with their Community Watershed groups and two of the four districts are actively coordinating with Resource Advisory Committees to determine existing vegetation conditions, prescribe desired conditions, and propose projects that achieve desired conditions.
- As the Designated Federal Official, the District Ranger of MiWok district on the Stanislaus NF worked with the Tuolumne County Resource Advisory Committee (RAC) to fund 400 acres of fuel reduction adjacent to Cedar Ridge, an identified community at risk.
- The Plumas NF held two public meeting for Mount Hough landscape assessment. As a result of public input from three agencies, six organizations, and twenty individuals along with field review, two additional alternatives were developed that also met the original purpose and need for potential projects.
- Fire Safe Councils, Fire protection districts, home owner associations, neighboring home owners, and recreation residents in specific areas are common collaborators among all responding forests.
- Frequent, routine and universal attendance at Fire Safe councils and meetings occurs through out the Sierra Nevada for development of community fire plans with fire departments and fire protection districts.

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Most forests which did landscape level fuel plans have not yet had the opportunity to use the planning for the project implementation. The Sequoia, the Stanislaus, the Eldorado and the Tahoe NFs however implemented landscape level fuel plans for respectively 16%, 30%, 80%, and 90% of those forests' FY 2004 fuel projects.

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Overall, of the 169,190 acres receiving fuel treatments on Sierra Nevada forests in FY 2004, 50% of the acres were located in Wildland Urban Interface (WUI) achieving the Regional goal set in the ROD for SNFPA bio-region (page 5). In addition 68% of the acres treated for fuels were treated through mechanical means, 29% of the acres were treated through prescribed burning and 3% through other treatments.

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The ROD adopted an active and focused adaptive management and monitoring strategy (pages 4 and 7). Forest implementation monitoring did vary considerably. The LTBMU, because of

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potential impacts to Lake Tahoe, has an extensive monitoring program that pre-existed the SNFPA. Over the last two years, the Tahoe NF conducted implementation monitoring on 90% of the projects within the HFQLG project area on the Tahoe NF and 60-80% of the remainder of the forest. The Modoc NF noted that the Annual Forest Plan Monitoring report details their monitoring for FY 2003 and the report for FY 2004 will be issued by June of 2005 if not before. The Eldorado NF sampled the planning and analysis on the SunDawg project. The Plumas NF monitored five projects including the Waters, Spanish, Camp, Jura, and Antelope-Border projects as well as completing Best Management Practices monitoring. The Stanislaus NF monitors implementation of approximately 25% of their projects. The Sequoia NF completed stream condition inventory plots for over two dozen projects before and after ground disturbing activities to carry out Riparian Conservation Objectives standards and guidelines.

Meadow Status and Trend Monitoring

The focus of the meadow monitoring program was to determine the ecological condition of montane meadows within the Sierra Nevada Forest Plan Amendment study area by monitoring a random selection of herbaceous meadows because of concerns raised in the Sierra Nevada Ecosystem Project Final Report, about the ecological condition of aquatic, riparian, and meadow ecosystems. Meadows in the sample area are distributed across a broad range of elevations and include remote meadows that are seldom visited as well as meadows with recreation and grazing activities and roads. Data collection included plant species composition, nested rooted frequency, ground cover, and soil hydrologic characteristics in a more holistic approach to ecosystem functioning than has been done in past studies.

Accomplishments

During 2004, the third field sampling season, sites were visited on nine National Forests from the Lassen to the Sequoia and on the Lake Tahoe Basin Management Unit. Higher priority new studies and limited funding reduced the field season resulting in fewer sites being visited than in 2003. Of the 48 sites visited, nine were eliminated because they did not meet the meadow criteria. The thirty-nine meadows sampled ranged from 5,800 to 11,000 feet. and equate to 195 transects, 234 subplots and 117 vegetation composition cross-sections as well as 228 soil points. Data for all three years of data collection has been entered into a Microsoft Access data base and will be migrated into the Natural Resource system data

base upon completion of quality control review of the data. Distribution of data to fulfill the requests of forest biologists has begun; most requests will be fulfilled when the quality control review is completed. The University of California at Davis, California Department of Fish and Game, USDA Forest Service Region 5 Range Assessment Program, and the USDA Forest Service Meadow Monitoring Program under the SNFPA are partnering to create a combined meadow database for the Sierra Nevada. The California Department of Fish and Game is taking the lead in database mergers. Researchers at the University of California at Davis already plan to use information in this database to design a study of Sierra Nevada meadows in 2005 and other interested parties will have access to this information.

Statistically significant results from the study cannot be derived because the existing sample size is too small given the variation across such a large geographic area. Some results are interesting or should be pursued further.

Of the 39 meadows sampled in 2004, five (13 percent) are considered to be heavily disturbed. One occurs at a ski area. One is bounded by thinning and bulldozer activity and previously served as a staging area for cattle collection or drop-off. Impacts of livestock grazing at three meadows included stream bank erosion, topsoil erosion, and exposure of soils, including organic soil. The high-elevation meadow shown below on the Inyo NF has had no disturbance and is considered pristine.



Amphibian Status and Trend Monitoring

The Amphibian Monitoring Program evaluates whether the Forest Service is achieving its management goals for the Yosemite toad (*Bufo canorus*) and mountain yellow-legged frog (*Rana muscosa*). Those goals are to protect and restore desired conditions for aquatic, riparian and meadow ecosystems and provide for the viability of species associated with those ecosystems. (SNFPA ROD 2004).

The Yosemite toad is endemic to the Sierra Nevada and the majority of the mountain yellow-legged frog's range also falls within the Sierra Nevada. Populations of both species have declined throughout areas occupied in the past. Both species are United States Fish and Wildlife Service candidate species for listing as threatened or endangered, California state species of special concern, and Forest Service sensitive species. Both species are found in high elevation aquatic systems. The Yosemite toad is most commonly found in shallow, warm water areas including wet meadows, small ponds, and shallow grassy areas adjacent to lakes. Because of its multi-year tadpole life stage, the mountain yellow-legged frog is most commonly found in larger, deeper lakes that do not freeze during the winter. Preliminary habitat analysis for both 2003 and 2004 support our current knowledge of habitat associations for both species

Accomplishments

In 2004, 1,027 lakes, ponds, meadows and streams were surveyed in 52 sample basins. Of these sites, 673 had available aquatic habitat. Thirty-five of these basins were sampled for the Yosemite toad, and all were sampled for the mountain yellow-legged frog. To date, a total of 75 basins have been sampled over the past three years. Eighteen of these basins have been re-surveyed in at least two of the years.

In 2004, fewer basins were occupied by the Yosemite toad than in previous years. In 2004, evidence of Yosemite toad breeding was found in 52 percent (14 of 27) of high probability basins (where toads have been found since 1990), compared with 75 and 85 percent respectively in 2002 and 2003. Adults or subadults were found in an additional 22 percent (six) of the basins.

As was the case in the previous two years, occupancy for the mountain yellow-legged frog was considerably lower than for the Yosemite toad. In 2004, evidence of



Yosemite toad tadpoles in typical habitat in the southern Sierra Nevada

breeding was found in 20 percent of high probability basins (5 of 25 basins) and adults or subadults in an additional 16 percent (four basins).

The goal of monitoring is to detect changes over time and there was little change in occupancy within re-surveyed basins from 2003 to 2004. Of the 13 basins sampled in both years for Yosemite toads, nine basins had evidence of breeding in both years and two basins had no animals. Of the two basins that changed occupancy status, one basin changed from having only adults or subadults in 2003 to having evidence of breeding in 2004, and one basin from no animals to evidence of breeding

Of the 18 basins that were surveyed in both years for the mountain yellow-legged frog, 4 were occupied in 2003. Two of the basins continued to have breeding in 2004, one changed from a breeding basin to only having adults or subadults, and one changed from having adults or subadults to having no animals in 2004. An additional basin that had no animals in 2003 had adults or subadults in 2004.

In addition to evaluating the success of Forest Service management strategies, this program will increase our knowledge of population dynamics and habitat requirements for both species, and provide information for making more informed management decisions.

New Studies

Several new studies have been or will be initiated in 2005. A collaborative effort by the Pacific Southwest Research Station and the University of California to study the effects of grazing on the Yosemite Toad under a Cooperative Ecosystem Study Agreement is expect to begin collecting base line field data in the summer of 2005. A draft study plan is under preparation and has been distributed for both public and peer scientific review prior to the field season.

A request for proposals to study of the effects of reducing canopy cover within California Spotted Owl Home Range areas has been awarded to the University of Minnesota, which will begin pre-treatment data collection in the summer of 2005.

Pacific Southwest Research station has also proposed several related studies investigating Pacific fisher including: genetic studies to determine if individual fishers can be identified from samples of their fur, field testing of fur/hair snaring methods and pilot studies to assess fisher habitat use and response to fuels treatments.

Working with Tribal Governments and American Indians

The commitment in the SNFPA FSEIS ROD (page 25) to meet trust responsibilities and encourage the participation of American Indians in national forest management was a continuation of the commitment in the 2001 ROD. Consequently it is not surprising that many of the activities the forests carried out were continuations of projects, agreements and protocols begun in past years and planning that will continue into the future. There are numerous highlights including:

- Plant collection sites on the LTBMU exclude sites known to be tribal collection areas.
- Consultation with the Tule River Tribe occurred on the Giant Sequoia National Monument Final Environmental Impact Statement and Management Plan.
- The new opportunities for Stewardship contracting with tribes have been discussed with tribes by forest leadership on the Stanislaus NF and the Modoc NF.
- The Plumas NF has implemented the Maidu Stewardship Project. The project includes, and the Forest has established, monitoring projects to determine changes in vegetation over the ten year project life in culturally significant plants. A Beargrass Restoration Project including fire treatment has been proposed to the County Resource Advisory Committee.
- The Sierra NF is working with tribal members from the Big Sandy Rancheria on fuel management plans and ways whereby Forest Service fire/fuel personnel can provide professional expertise with respect to fuel management to the tribe.
- The Master Participating Agreement for Land Stewardship Partnership in the Medicine Lake Highlands which will assist tribal member participation in the design and implementation of projects planned to protect or enhance the cultural values in the Medicine Lake Highlands was developed.
- A Memorandum of Understanding (MOU) between Susanville Rancheria, the Lassen NF and the Bureau of Land Management is pending signature.
- The California Indian Basket Weavers Association and the Eldorado NF are planning for a gathering area for ferns, which will include a site management plan and issuance of a special use permit.
- In consultation with tribal elders, the Sierra NF made a presentation on "Incorporating Traditional Native American Practices into Fuel Management" and a plant display with interpretation at an Ethno-botanical Conference.
- The Tahoe NF and the Pyramid Lake Piate Tribe worked closely on the Lahontan Cutthroat Trout Recovery Plan.
- Off highway vehicle use monitoring on the Stanislaus includes culturally significant species.
- The Plumas NF hosted field trips for tribal representatives for the Empire and Chandler/Dancehouse landscape level projects.
- The Sequoia NF holds quarterly meetings with the Tule River Tribe to discuss activities related to the ongoing cooperative fire and fuels agreement.
- Consultation during project planning and NEPA development occurs for a wide variety of projects such as: fuel treatment projects, post - wildfire restoration, reforestation projects, noxious weed projects (especially in relation to traditional plant uses), traditional uses of both plants and areas, culturally important plants, and prescribed burns on the forests.

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www.fs.fed.us/r5/snfpa

Other websites that may be of interest

www.fs.fed.us/psw

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