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# Land and Resource Management Plan Monitoring and Evaluation Report

## Fiscal Years 2009 & 2010

**Shasta-Trinity National Forest**
**California**

# Shasta-Trinity National Forest
# Land and Resource Management Plan
# Monitoring and Evaluation Report

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**Shasta-Trinity National Forest**

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# Current Trends and Highlights

- **In 2009, pumice moonwort was re-discovered on Mt. Shasta.**
- **The record of decision for subpart B of the 2005 Travel Management Rule was signed in FY2010.**
- **Law enforcement activity increased in both reporting years.**
- **Data from a University of Washington study conducted on the Forest indicated that OHV noise had a negative impact on the reproductive success of northern spotted owls within 100m of a road.**
- **During the reporting period trees were planted on over 3,700 acres that burned at high severity during the 2008 wildfires.**
- **A total of over 500 acres of fish habitat was improved during 2009 and 2010.**
- **Stream surveys for spring-run chinook and steelhead resulted in lower counts than in recent years.**
- **Less than 20% of needed road maintenance was completed each fiscal year.**
- **The Packer's Creek bridge was completed in 2009.**
- **The Barker Creek bridge was completed in 2010.**
- **Two office buildings were constructed at the McCloud Ranger District.**

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# CHAPTER 1. MONITORING FRAMEWORK

## FOREST MONITORING ACTIVITIES

The implementation of the Shasta-Trinity National Forest's Land and Resource Management Plan (Forest Plan) establishes the framework for translating management direction into goals, objectives, and standards for on-the-ground projects.

Monitoring and evaluating the implementation process, effects and outputs helps determine how well the Forest Plan objectives are being met and how closely standards and guidelines are being followed. Chapter Five of the Forest Plan displays the items identified for monitoring and verifying implementation of the plan.

The Forest Plan is based on the President's Northwest Forest Plan and includes monitoring guidance from the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl (ROD).

## FOREST MONITORING SYSTEM

**Monitoring Scales** - Information obtained through the monitoring and evaluation system was reported at several different geographic scales including management areas, watersheds, individual project areas, or the Forest as a whole. For this report, information was collected at both the District and Forest level with District information aggregated up to the Forest level whenever possible.

**Monitoring Levels** - Information for this report came from three levels of monitoring:

1. Project Environmental Analysis
2. Single Resource - Forest Program Assessment
3. Forest-wide Multiple Resource Assessment

Each level consists of two components: data acquisition and administrative review. Data acquisition refers to the collection and processing of environmental data. Administrative review refers to program analysis after the information has been evaluated and compared with Forest Plan objectives, standards, and guidelines.

The Forest databases will be updated periodically. Each of the above levels will contribute to the process, but project level assessments will be the most often used means of insuring that District level information is incorporated into the broader Forest data-base.

**Project Environmental Analysis** - One of the common processes available for monitoring is project environmental analysis where on-the-ground information is compared with the existing database. This information is used to verify assigned management area prescriptions, projected outputs, and objectives originating from the Forest Plan for updating, if necessary.

**Single Resource - Forest Program Assessment -** The next level is a Forest-wide assessment of single resources and Forest programs. For example, single resources such as bald eagle habitat or anadromous fisheries are site-specific, but they may not coincide with project environmental assessments.

**Forest-wide Multiple Resource Assessment** - The Forest-wide scheme includes intensive field surveys and high resolution remote sensing data which provide the framework for monitoring single resources and Forest programs. As in the other two levels, information obtained in these assessments will be used for updating the existing data-base for multiple resources and comparing results with Forest objectives.

Activities monitored during fiscal year (FY) 2009 and FY 2010 as part of the Forest's monitoring and evaluation program included; reforestation success, thinning and release, timber sales, inventories of cultural sites; wildlife and fisheries habitat condition and the presence of selected Threatened, Endangered, and Sensitive species. Outputs associated with timber products, roads, fuel management, habitat improvement projects and livestock grazing were also monitored.

Elements identified in Chapters 4 and 5 of the Forest Plan that were monitored and reported on a Forest-wide basis in FY 2009 and FY 2010 included soil productivity, Best Management Practices, habitat restoration, inventories of species/habitats, inventories of special habitat components, application of selected S&Gs and verification of inventories of cultural sites.

## EVALUATION OF MONITORING RESULTS

Overall, when specific standards and guidelines were monitored for implementation or effectiveness, the Forest was successful in meeting or in moving closer to Forest Goals and Objectives.

## CONTRIBUTION TO NATIONAL STRATEGIC PLAN

The USDA Forest Service Strategic Plan for Fiscal Years 2007-2012 displays seven conservation goals for the Nation's forests and grasslands. The seven goals are based on four current threats to conservation: (1) growing fire danger due to hazardous fuel buildups, (2) the introduction and spread of invasive species, (3) loss of open space, and (4) unmanaged recreation, particularly the unmanaged use of off-highway vehicles. The seven goals of the Strategic Plan include:

1. Restore, Sustain, and Enhance the Nation's Forest and Grasslands.
2. Provide and Sustain Benefits to the American People.
3. Conserve Open Space.
4. Sustain and Enhance Outdoor Recreation Opportunities.
5. Maintain Basic Management Capabilities of the Forest Service.
6. Engage Urban America With Forest Service Programs.
7. Provide Science-Based Applications and Tools for Sustainable Natural Resources Management.

# CHAPTER 2. SUMMARY OF RESULTS

## PUBLIC USE AND INFORMATION PROGRAMS

### Heritage Resource Management

Multiple heritage sites were recorded, updated, and monitored in both fiscal years. There were 76 projects surveyed in 2009 and 68 in 2010. A majority of projects were covered by the Programmatic Agreement for Section 106. Inadvertent effects identified during monitoring have resulted in the initiation of administrative steps to avoid future effects.

### Recreation

***Partnerships:*** There has been a strong emphasis on partnerships, volunteerism and hosted programs on the Forest since 1995. In 2009 and 2010 the Forest maintained partnerships with numerous local, state, and national organizations.

***Off Highway Vehicles (OHVs):*** The Motorized Travel Management Record of Decision (ROD) was signed in 2010. The ROD implements subpart B of the 2005 Travel Management Rule. The ROD designated areas for OHV recreation.

***Pacific Crest Trail (PCT):*** Each year the California Conservation Corps, the Back Country Horsemen and the Pacific Crest Trail Association helped the Forest maintain the PCT.

### Wilderness

The Forest implemented the 10-year Wilderness Stewardship Challenge. Element 4 and element 5 of the Challenge were focused on in 2009 and 2010 respectively. Wilderness education plan priority actions continue to be implemented (element 4), and a survey of user solitude was initiated (element 5).

Additionally, the Forest Fire Management Plan was revised; including aspects of managing wildfire in wilderness. The Outfitter Guide Operating Plan was also revised. Non-federal partners initiated efforts to monitor invasive weeds and inventory recreation sites in wilderness.

Areas of potential boundary encroachment were posted, and the temporary campfire closure order issued in 2008 was extended for high elevation lakes.

### Law Enforcement

Illegal activities continued to increase in the number of marijuana gardens, plants and sophistication of management; vandalism and theft of property, resource damage from OHV use, range allotment fences, and theft of fuelwood and timber. Law enforcement statistics show an increase in 2009 and 2010 from 2008 levels, but the numbers are still

below the 10 year average of incidents per year. Increased recreation at Shasta Lake has increased the burden on law enforcement for enforcing recreational rule violations.

# SOCIAL AND ECONOMIC ENVIRONMENT

## Hayfork Adaptive Management Area

The University of Washington study on noise disturbance by OHV use on northern spotted owls was completed in 2009. The research found that owls nesting within 100m of a road showed a strong association between high noise and lower reproductive success. However, reproductive success was higher for nests located within 100m of quiet roads when compared to nests further from the roads (up to 800m).

New survey techniques to detect areas inhabited by northern spotted owls using trained dogs are being developed and tested in the Hayfork AMA. Research suggests that trained dogs are effective at detection.

The Miner's Fire Assessment was completed by the Watershed Research and Training Center, a non-federal partner. A final draft is expected by February 2011. The Wallow Fire Assessment was completed in 2008, and the Wallow Fuels Reduction project NEPA compliance was completed in 2009. Implementation is expected in 2011.

## Community Development and Partnerships

The Forest executed 92 new agreements in 2009 and 58 new agreements in 2010. The Trinity County Resource Advisory Committee approved 19 projects in 2009 and 24 projects in 2010 awarding over $1,000,000 during the two year period. Shasta County awarded over $100,000 for 2 projects approved in 2009. In addition to the two Resource Advisory Committees, there were over 30 partners involved with grants or agreements in each fiscal year.

## Tribal Relations Program

Consultation continued with Native Americans for timber sales, special use permits and recreation improvements on all management units of the Forest. The Forest collaborated with the tribes to manage significant places and resources including projects for aspen release at Toad Lake and bear grass burning on Horse Ridge.

# RESOURCE MANAGEMENT PROGRAMS

## Fire and Fuels

Prescribed Fire Monitoring*:* Initial monitoring of the Green Mountain project indicates that prescribed fire is successful at reducing dead fuel loading, minimizing understory

growth, and stimulating forage for game species, while reducing the possibility of catastrophic fire.

Vegetation Treatment Monitoring: Two projects (Musser Hill and China Gulch) were successfully completed using collaborative efforts. Treatments included biomass removal, pruning, and pile and burning.

***Activity Fuels:*** Timber sales were analyzed for amount of activity fuels likely to be generated by the projects, and project specific activity fuels treatments were developed.

## Timber Management

***Allowable Sale Quantity:*** The timber volume awarded in 2009 totaled approximately 14.8 MMBF. The timber volume awarded in 2010 totaled approximately 10.4 MMBF. These were both short of the 82.0 MMBF allowable sale quantity (ASQ) stated in the Forest Plan. The low volume awarded in 2010 reduced the average annual timber volume from 54.8 MMBF (70% of the ASQ in the Forest Plan), to 49.5 MMBF, (approximately 60% of the ASQ).

***Silvicultural Systems:*** In 2009 and 2010, the Forest did not meet annual regeneration cutting objectives, but exceeded the intermediate and salvage cutting Forest Plan objectives.

***Reforestation:*** Reforestation accomplished totaled 711 acres in 2009 and 3,093 acres in 2010. This is about 20% and 88% respectively of the amount listed in the Forest Plan. Emphasis on silvicultural treatments other than regeneration treatments has kept reforestation acres low.

***Timber Stand Improvement:*** Acres accomplished totaled 3,623 in 2009 and 4,514 acres in 2010. This amount fell short of the objectives in the Forest Plan (5,300 acres).

***Biomass:*** In 2009, approximately 82 MBF of biomass was sold, and 829 MBF was sold in 2010. No Forest Plan standards were set for biomass.

## Forest Health and Protection

Aerial detection surveys in 2009 detected a statewide increase in acres of conifer mortality attributed to bark beetle attacks compared to 2008, but there was a slight decrease of mortality from bark beetles on the Forest with an increase in intensity of mortality (measured in number of trees affected). The 2010 aerial survey showed an increase in the number of acres of bark beetle caused mortality in certain areas on the Forest, which can be attributed to bark beetle attacks that occurred in 2009.

## Range Management

***Sustainability of Forage:*** In 2009, 3,127 animal-months of grazing were permitted, and 2,502 were actually used. In 2010, 3,333 animal months of grazing was permitted,

and 2,339 were actually used. The projected annual output in the Forest Plan is 8,300 animal-months.

In 2009, all eleven allotments that were stocked with livestock were monitored for forage utilization and livestock distribution. Eight of the eleven allotments met Forest Plan standards and guidelines for forage utilization at each monitoring location. Three of the allotments exceeded Forest Plan standards and guidelines for forage utilization for at least one monitoring location.

In 2010, all ten allotments that were stocked with livestock were monitored for forage utilization and livestock distribution. All ten met Forest Plan standards and guidelines.

In 2009, of the 11 allotments that were stocked with livestock, one was monitored for range readiness. In 2010, 9 out of 10 allotments that were stocked with livestock were monitored for range readiness. One of the allotments was determined to be not-ready in portions of the range and the livestock turn-out date was delayed by two weeks.

***Range Improvements:*** In 2009, one fence was constructed to protect approximately 172 acres of riparian area. In 2010, two exclosure fences were constructed to protect approximately 0.3 acres of sensitive plant habitat.

In 2009, eleven existing range improvements were inspected and maintained, protecting about 1,879 acres of riparian or otherwise sensitive habitat. In 2010, fifteen existing range improvements were inspected and maintained, protecting about 2,055 acres of riparian or otherwise sensitive habitat.

***Allotment Management Plans:*** Eleven allotments and ten allotments that were stocked with livestock respectively in 2009 and 2010, were monitored for compliance with Allotment Management Plans and Term Grazing Permit Terms and Conditions.

# BIOLOGICAL ENVIRONMENT

## Fisheries Management

***Sport Fisheries:*** In Shasta, Trinity and other smaller lakes on the Forest, 300 acres and 255 acres of habitat was improved in 2009 and 2010 respectively.

In 11 cages on Shasta, Trinity and Lewiston Lakes, 700 trophy sized trout per cage were raised and released each year.

***Summer Steelhead and Spring-run Chinook Salmon Habitat:*** In South Fork Trinity stream snorkeling surveys, surveyors counted 118 spring-run Chinook and 94 steelhead in 2009. Surveyors counted 120 spring-run Chinook and 88 steelhead in 2010. These numbers are lower than recent year's results.

***Improve the Anadromous Fishery:*** Fish passage was supported in three streams in 2009 and 2010: Packer's Creek, Soldier Creek, and Barker Creek. Road decommissioning and watershed restoration also took place, primarily in tributaries to the South Fork Trinity. Stream snorkel surveys took place for anadromous fish in the South Fork Trinity.

***Wild Trout and Salmon:*** Six aquatic inventories were conducted using the Steam Condition Inventory method over the 2 year period. Eleven salmon/steelhead/red and/or spawning surveys were conducted in 2009 and 13 were conducted in 2010.

A revised draft of a Redband Trout Conservation Agreement is being circulated for interagency review.

Steam restoration work was conducted both years in Trout Creek, a tributary of the McCloud River that harbors the rare redband Trout.

***Instream Flows:*** An agreement was signed by PG&E in 2004 to increase flows in the Pit River. The agreed upon flows are not planned to be implemented for several years. Monitoring projects were planned in 2009 and 2010 for implementation after flows increase. The Forest worked closely with partners in negotiating instream flow needs.

## Wildlife Management

***Late Successional Reserves:*** Project planning progressed on several LSR improvement projects in 2009 and 2010: Gemmill Thin project, Harris Mountain project, Pettijohn project, Mudflow project, Algoma project, Moosehead project, and Elk project. All projects are implementing the LSR Assessment that was written in 1999, and have the purpose of improving conditions in LSRs and enhancing resiliency with large scale disturbance.

***Threatened, Endangered and Sensitive Species:*** In both 2009 and 2010 the Forest managed for six threatened, two endangered, and two candidate terrestrial species***.***

***Wildlife Management: Neotropical Birds:*** Two bird banding stations collected bird population data in 2009 and 2010 in accordance with the Monitoring Avian Productivity and Survivorship protocol. Breeding bird surveys were also conducted along several point count locations on the Forest. Both of these surveys monitor bird populations and contribute data to a larger database monitoring neotropical birds.

***Biological Diversity: Snag Retention:*** Snag levels were collected via visual surveys in timber sale areas. All areas surveyed met snag retention level standards and guidelines in the Forest Plan.

Northern Spotted Owl Monitoring – Shasta Forest***:*** Northern spotted owl habitat was surveyed on 50,000 acres and 40,000 acres in 2009 and 2010 respectively. Spotted owl pairs were found at 7 sites in 2009 and 3 sites in 2010.

Northern Spotted Owl Monitoring – Trinity Forest***:*** Northern spotted owl habitat was surveyed on 147,200 acres and 172,800 acres during 2009 and 2010 respectively. During 2009, 23 pairs of spotted owls were found, along with 36 single owls. During 2010, 30 pairs of spotted owls were found, along with 17 single owls. Only a portion of the pairs found each year were confirmed to be nesting.

Small Owl Monitoring***:*** The Owl Capture and Census protocol was followed. During 2009, 1 species of small owl (western screech) was detected, and during 2010, 2 species of small owl (western screech and flammulated) were detected.

Peregrine Falcon Monitoring*:* Biologists surveyed 9 peregrine territories by following established survey protocols. Six of the territories were confirmed to have nesting activities.

Northern Goshawk Monitoring*:* In 2009, 32 goshawk territories were surveyed with 10 occupied, and in 2010, 49 territories were surveyed with 11 occupied.

Bald Eagle Monitoring*:* Winter and nesting season surveys were conducted in 2009 and 2010 on Shasta, Trinity and Lewiston Lake. Winter results in 2009 were 69 eagles total. Nesting survey results were 32 nesting territories were occupied. Of a subset that was monitored for fledgling success, 15 chicks were fledged. Winter results in 2010 were 69 eagles total. Nesting survey results were 27 territories were occupied. Of a subset monitored for fledgling success, 16 chicks fledged. During both years, 2 nesting sites were closed to public access to prevent disturbance.

Green Mountain Prescribed Burn Project*:* Prescribed burns were implemented for wildlife habitat restoration purposes. A total of 600 acres were burned in 2009, and 1,100 acres were burned in 2010. Two bald eagle nest stands were burned at low intensity to reduce surface fuel loading.

Nightjar Monitoring*:* Four routes were surveyed each year for nightjars. Nightjars were observed on 2 routes in 2010.

Fisher Monitoring*:* Baited remote sensing camera stations were used to detect fishers. Nine camera stations were used in 2009 and 20 stations were used in 2010. In 2009, 5 stations had fisher detections. In 2010, 18 camera station had fisher detections.

Bat Monitoring*:* Bat mist nest monitoring was conducted at 3 locations in 2009 and 2010. During the 2 years, over 300 bats were captured, including 13 species. Two of the species caught are Forest Service sensitive species.

Survey and Manage Monitoring: In 2009 and 2010, 1,000 acres were surveyed for 2 species of mollusk. Of the acres surveyed, one site of a survey and manage species was detected.

## Botany

***Sensitive Plants:*** Surveys were conducted in suitable habitat in 2009 and 2010. In 2009, one population of a rare plant was rediscovered on Mt. Shasta. It was last documented in 1940. In 2010, approximately 20 populations of rare plants were identified. Botanical Biological Evaluations were written for 17 projects during 2009 and 2010.

***Conservation Strategies:*** In 2009, the long-bearded star-tulip and Columbia cress were monitored in support of updating the Conservation Strategies for both species. In 2010, genetic diversity analysis was conducted for the Shasta snow wreath and an unknown huckleberry species. Both species would be affected if Shasta Dam is raised, as proposed by the USDI Bureau of Reclamation.

Collaboration in Weed Management Areas (WMAs): Forest weed program coordinators cooperated with agencies and non-government organizations in Siskiyou, Shasta, and Trinity WMAs to develop and implement weed projects.

Databases: Weed inventory data entry into NRIS is complete for 2009. 2010 data entry is not complete pending submittal of data from contractors and enterprise teams. Weed treatment and efficacy monitoring data for 2009 and 2010 are complete and in the Forest Service Activity Tracking System (FACTS) database.

# PHYSICAL ENVIRONMENT

## Soil

Background erosion, disturbance erosion, and compaction were monitored in several areas of the Forest. An area burned by wildfire was surveyed pre and post fire and a mastication project area was monitored for compaction.

A fire occurred in the Chappie-Shasta OHV area in 2008, and erosion data was collected pre and post fire. Pre-fire, the Chappie-Shasta OHV area had several instances of high erosion rates, especially on trails that have high levels of use. Post fire, mulching was shown to have an effect on reducing erosion, and trail improvements such as rolling dips also reduced erosion significantly. Erosion rates jumped significantly after the park was re-opened to use post fire in the spring of 2009.

The mastication project took place in 2009. The low-pressure masticator was operating in high compaction hazard rated soils when the soils were wet to very wet. Compaction was a concern. Results showed that low-pressure masticators can operate on wet soils without causing excessive displacement or compaction on slopes less than 35%.

## Minerals

The mineral s program completed NEPA for one plan of operations in 2009 and two in 2010. Quarterly monitoring resulted in one notice of non-compliance in 2009 and none in 2010. In both years several abandoned mine adits were closed.

## Lands

The Hagen-French Ranch land exchange resulted in 140 acres of Forest Service near Weaverville being exchanged for 175.97 acres of private land south of Hyampom along the South Fork Trinity River.

## Best Management Practices

The Forest monitored 63 randomly selected sites in 2009 and 68 sites in 2010 for protection of soil and water resources in accordance with regional protocols. Monitoring sites were selected at a variety of project types including: timber, engineering, recreation, range, fire, minerals, and other types of vegetation

management. BMPs were implemented at 93% of sites in 2009 with an effectiveness rate of 82%. In 2010, implementation dropped to 82% while effectiveness remained the same as the previous year.

## Watershed Restoration

The Forest worked with the Trinity County Resource Conservation District to implement legacy road projects designed to reduce surface erosion and improve stream crossings. Restoration activities along Rattlesnake Creek were implemented to promote capture of high flows back onto the floodplain. Two watershed analyses were completed in 2010.

# FACILITIES MANAGEMENT

## Road Maintenance

In 2009, 405 miles of high clearance roads were maintained, 868 miles of passenger vehicle roads were maintained, 119 miles of roads were reconstructed, and 19 miles of roads were decommissioned. Results show that only 19% of roads received some type of maintenance, due to budget constraints.

In 2010, 710 miles of high clearance roads were maintained, 529 miles of passenger car roads were maintained, 17 miles of roads were reconstructed, and 2 miles of roads were decommissioned. Results show that only 18% of roads received some type of maintenance, due to budget constraints.

## Dams and Bridges

The Forest is in compliance with required dam and bridge inspection frequencies. In 2009, the Packer's Creek Bridge was built. In 2010, the Barker Creek Bridge was built. The bridge construction met aquatic organism passage requirements.

## Buildings and Administrative Sites

The Forest was in compliance with required inspection frequency and deferred maintenance protocols. Current funding levels were not sufficient to maintain buildings to standard. Two office buildings were under construction during 2009 and 2010 in the McCloud Ranger station. Due to the new buildings, seven existing buildings will be available for removal resulting in a reduction in deferred maintenance costs.

## Potable Water Sources

Monthly bacteriological tests were completed in both years, with positive results in 9% of routine tests and 3% of repeat tests in 2009, and 3% of routine tests and 1% of repeats in 2010.

# CHAPTER 3. MONITORING DETAILS

## PUBLIC USE AND INFORMATION PROGRAMS

### Heritage Resource Management

**Forest Plan Standard:** For Prescription XI (Heritage Resource Management) sites, achieve full compliance with Section 106 and develop required protection plans. (Ref: Forest Plan, page 4-50, D3, D12)

**Monitoring Objectives:** To ensure that Forest's program of work is in compliance with Section 106 and 36 CFR (code of federal regulations) 800. Determine if plans have been completed for significant heritage resources and determine if sites are being monitored sufficiently.

**Methods:** Summarize the Annual Report for the Section 106 Programmatic Agreement describes Forest compliance with Section 106 and monitoring efforts.

**Results:** Monitoring was recorded at historic properties associated with Section 106 compliance for timber sales. In 2009 there were 7,642 acres surveyed on 76 projects. In 2010, 3,062 acres were surveyed on 68 projects. In 2009, nine sites were recorded, 48 were updated and nine Forest Plan sites were monitored. In 2010, two sites were recorded, 13 were updated and 10 Forest Plan sites were monitored. In 2009 and 2010 a majority of projects fell under the Programmatic Agreement for Section 106.

Based on the monitoring of timber sales, several inadvertent effects to historic properties were identified. Administrative steps were initiated to avoid future effects. Reviews by the State Historic Preservation Office and Region 5 support this conclusion.

Information resulting from archaeological studies is being shared with other specialists preparing watershed studies.

**Recommendation:** In some cases monitoring sites needs to be more frequent and priority of monitoring needs to be given to Prescription XI sites within proposed actions. Increased coordination between program of work and Section 106 compliance needs.

**Public Involvement:** Public involvement occurs during the NEPA process.

**Data location**: Heritage department, Forest headquarters, Redding, CA.

### Recreation

#### *Partnerships*

**Forest Plan Standards:** Promote partnerships with user groups to assist in the operation, maintenance, and development of recreation sites and facilities (Ref: Forest Plan, page 4-23, r).

**Monitoring Objective:** To identify existing partnerships and partnership opportunities.

**Method:** Recreation staff participated in on-going discussions related to maintaining and expanding existing partnerships, developing new partnerships, exploring new ways of doing business, and determining the most efficient means for accomplishing program objectives, including providing safe, quality recreation opportunities and meeting the diverse needs of the recreating public.

**Results:** In FY 2009 and FY 2010, the Forest maintained partnerships with Ascend Wilderness Experience, Backcountry CCC, Backcountry Horsemen of America, Backcountry Horsemen of Northern California, Boys Scouts of America Troop 156, California Conservation Corps (CCC), Friends of the Mt. Shasta Avalanche Center, Hayfork Watershed Research and Training Center, Indian Valley Summer Camp, Pacific Crest Trail Association, Recreation Outdoors Coalition, Redding Mountain Biking, Trail Weavers, Redding Dirt Riders, Shasta Lake Improvement Project Partnership, Shasta and Trinity Houseboat Owners Associations, Sierra Club, Trinity County Resource Conservation District, Trinity River Outfitter-Guides, and the Weaver Basin Trails Committee.

These partners assist the Forest in operating, maintaining and enhancing recreation sites and trails for forest visitors. The majority of the developed sites in the National Recreation Area continue to be managed by concessionaires. The Shasta Recreation Company was selected in December 2010 as concessionaire to manage the Shasta Unit and the Trinity Unit of the NRA (National Recreation Area).

The Trinity River Management Unit (TRMU) has suggested the Buddhist Monastery in Junction City as a potential partner to engage in 2011 because of its active promotion of resource ethics and community service.

Completion of the Recreation Facility Analysis (RFA) in 2008 resulted in a five-year program of work that lists possible actions to more effectively manage recreation sites and meet public needs and expectations. Following NEPA, identified projects would be pursued subject to funding, with public notification. The Recreation Site Improvement (RSI) program is a limited three-year program which began in 2008 and implements the RFA. Projects approved by the Washington Office for implementation are funded by a portion of the Land and Water Conservation Fund receipts made available through the Recreation Enhancement Act authority for the reduction of deferred maintenance. Partnerships were pursued, but none were established to maintain facilities under this program.

The Shasta-Trinity National Forest received 1.8 million dollars in FY 2009 to begin implementation of the RSI and reduce deferred maintenance in recreation facilities. The following projects were completed in FY 2010:

- Fowlers Campground: replace vault restrooms, tables, fire rings, parking barriers and three American Disabilities Act compliant water hydrants (Siskiyou County).
- Lakeshore East Campground: Replace one flush restroom (Shasta County).
- Tannery Campground: Replace four flush restrooms (Trinity County).
- Pine Cove Boat Ramp: Replace one vault restroom (Trinity County).

**Recommendations:** Continue to promote partnerships and explore ways to improve efficiency and the condition of Forest facilities.

**Public Involvement:** Included direct involvement with partners, stakeholders, other Forests, other agencies and interested community members.

**Data location:** Public Uses Department, Forest Headquarters and District Offices.

### *Off Highway Vehicles (OHV)*

**Forest Plan Standard:** Cooperate with the State, other agencies, and user groups to identify potential OHV trails. Where compatible with management objectives, develop segments of OHV trails that support the concept of a statewide OHV trail system. (Ref: Forest Plan, page 4-23, #16 f.)

**Monitoring Objective:** To document progress on implementation of the 2005 Travel Management Rule and the 2010 Shasta-Trinity National Forest Travel Management Record of Decision (ROD) for subpart B of the 2005 rule.

**Method:** Document progress made on implementation of the Travel Management Rule.

**Results:** The ROD was signed in FY 2010. It designated areas for OHV recreation and added OHV trails to the Forest transportation system. These trails will be brought to standard in 2011 and will be shown on the motor vehicle use map. A Legacy grant proposal was submitted to fund trail standardization tasks. An OHV grant was received by the State in 2010 to help implement Travel Management measures.

**Recommendations:** Continue to implement the Travel Management Rule and work towards defining a system of additional designated routes and motorized use areas. Promote increased public participation in the process.

**Public Involvement:** Direct involvement with motorized and non-motorized user groups, other state and federal agencies and local community members occurred in both 2009 and 2010.

**Data location:** Public Uses Department, Forest Headquarters, Redding, CA.

### *Pacific Crest Trail (PCT)*

**Forest Plan Standard:** Provide a safe, usable, and convenient passage through the project area or a reasonable detour during the entire period of project activities. As a minimum, detours will consist of temporary route markers and a four-foot wide travel way cleared of vegetation. Tread work will only be performed to allow safe stock passage. (Ref: Forest Plan, page 4-23, #16 b.2)

**Monitoring Objective:** To identify projects affecting the PCT and document collaborative efforts for PCT maintenance.

**Method and Results:** In 2009 and 2010 the California Conservation Corps, the Back Country Horsemen and the Pacific Crest Trail Association helped maintain the portions of the PCT that traverse the Forest. In 2010 the Northwest Service Academy (ARRA project dollars through the Pacific Crest Trail Association), the Youth Conservation Corps and the Mt. Shasta Trail Association were involved with trail maintenance on the PCT.

**Recommendations:** Provide regular maintenance on the sections of the PCT that cross the Forest. Continue to provide safe, useable and convenient passage for users. Ensure the appropriate level of training is provided for individuals performing maintenance and enforce the use of Personal Protective Equipment while performing trail maintenance activities on the PCT.

**Public Involvement:** Direct involvement with the California Conservation Corps, Back Country Horsemen of America, Pacific Crest Trail Association, Northwest Service Academy, Youth Conservation Corp, Mt. Shasta Trail Association and "through hikers."

**Data location:** Public Uses Department, Forest Headquarters and District Offices.

# Wilderness

## *Develop Direction*

**Forest Plan Standard:** Develop wilderness direction to guide annual programs and long-term strategic actions in the Forest's five wildernesses. (Ref: Forest Plan page 4-29, #24a).

**Monitoring Objective:** To document activities associated with the 10-year Wilderness Stewardship Challenge.

**Method**: A nationwide 10-Year Wilderness Stewardship Challenge was initiated in FY 2005 to ensure that all wilderness areas are meeting common objectives that will result in quality wilderness areas. Components of the strategy include addressing noxious weeds, the natural role of fire, environmental education, information needs documented, Forest Plan direction, campsite inventories and meeting baseline workforce targets.

**Results**: The FY 2009 focus of the 10-year Wilderness Stewardship Challenge was Element 4: to ensure that "priority actions identified in the wilderness education plan are implemented." Examples of priority actions taken include:

- Providing "leave no trace" policy information to the public.
- Ensuring permitted outfitter guides foster wilderness preservation philosophies.
- Updating trailhead bulletin boards with updated regulations and other pertinent information.

The FY 2010 focus of the 10-year Wilderness Stewardship Challenge was to Element 5: to ensure that the "wilderness had adequate direction, monitoring and management actions to protect opportunities for solitude or primitive and unconfined recreation." A Solitude Survey pamphlet was developed by a non-federal partner for the Trinity Alps Wilderness and distributed for public input.

Additional actions taken in 2010 include revision of the Forest Fire Management Plan to include the Wilderness Fire Management Checklist. The Outfitter Guide Operating Plans were revised to direct outfitters to model appropriate wilderness practices and awareness of wilderness values.

The Upper Sacramento River Exchange, a non-federal partner received a National Forest Foundation grant to complete a recreation site inventory and analysis at Castle Crags Wilderness in 2010. The inventory was completed August of 2010. The analysis was completed in the fall of 2010.

**Recommendations**: Continue to implement the 10-year Wilderness Stewardship Challenge.

**Public Involvement**: Included direct involvement with partners, stakeholders, other forests, other agencies and interested community members. Encourage non-federal partners to apply for National Forest Foundation grants that address the 10-year Wilderness Stewardship Challenge.

**Data location**: Public Uses Department, Forest Headquarters and District Offices.

### *Encroachment Sites*

**Forest Plan Standard:** Post potential encroachment sites on the boundaries of the five Wildernesses as necessary. (Ref: Forest Plan page 4-29, #24b)

**Monitoring Objective**: To evaluate compliance with wilderness boundary posting requirements.

**Method**: Wilderness boundary posting is an on-going Forest program. Posting is routinely conducted in conjunction with specific projects, such as timber sale activity adjacent to Wilderness for Forest Service and private lands timber management.

**Results**: Areas of potential encroachment were monitored and posted in FY 2009 and FY 2010.

**Recommendations:** Continue program.

**Public Involvement:** None.

**Data location:** Public Uses Departments at District Offices.

### *Visitor Information*

**Forest Plan Standard**: Initiate visitor information and education programs that interpret and emphasize values and behavior that protect wilderness resources. Post regulations, orders, and/or permits outside the Wilderness boundaries. (Ref: Forest Plan page 4-29, #24f).

**Monitoring Objective:** Identify methods utilized for education and information sharing with various publics.

**Method:** Seasonal wilderness rangers meet visitors and provide them with information. Signs and pamphlets are also posted at developed trailheads. The Trinity River Management Unit is utilizing an "electronic kiosk" to disseminate wilderness information, education, and permits. Recreation Opportunity Guides are available either in hard copy form or on the Forest website http://www.fs.fed.us/r5/shastatrinity/maps/rog-index.shtml.

**Results:** Various methods of sharing information related to wilderness ethics and protecting wilderness character were used. The temporary campfire closure order issued in 2008 for the Trinity Alps Wilderness was extended for high elevation lakes at Canyon Creek and Stuarts Fork headwaters to decrease defoliation of natural vegetation and allow for recovery.

**Recommendations:** Continue using proven methods and develop new ways of disseminating information to wilderness users. Continue to monitor the effectiveness of the campfire closure order before making a decision as to whether to implement it for a longer period of time.

**Public Involvement:** Utilization of materials provided for educational or informational purposes.

**Data location:** All Ranger District Offices and Forest Headquarters.

## Law Enforcement

**Forest Plan Standard:** Protect the public interest by a thorough and aggressive program of violation prevention, violation detection, investigation and apprehension of violators and the presentation of cases for prosecution. (Ref: Forest Plan page 4-21, #13)

**Monitoring Objective:** To document the annual number of reported incidents.

**Methods:** Data is summarized yearly by Law Enforcement staff in the Law Enforcement and Investigations Management Attainment Reporting System (LEIMARS) report.

**Results and Recommendations:** LEIMARS annual statistics for Shasta-Trinity Forest: Incidents, Warnings, Citations and Arrests for the past ten years are shown in Figure 1. Fiscal year 2009 had 1,562 entries and 2010 had 1,305 entries.

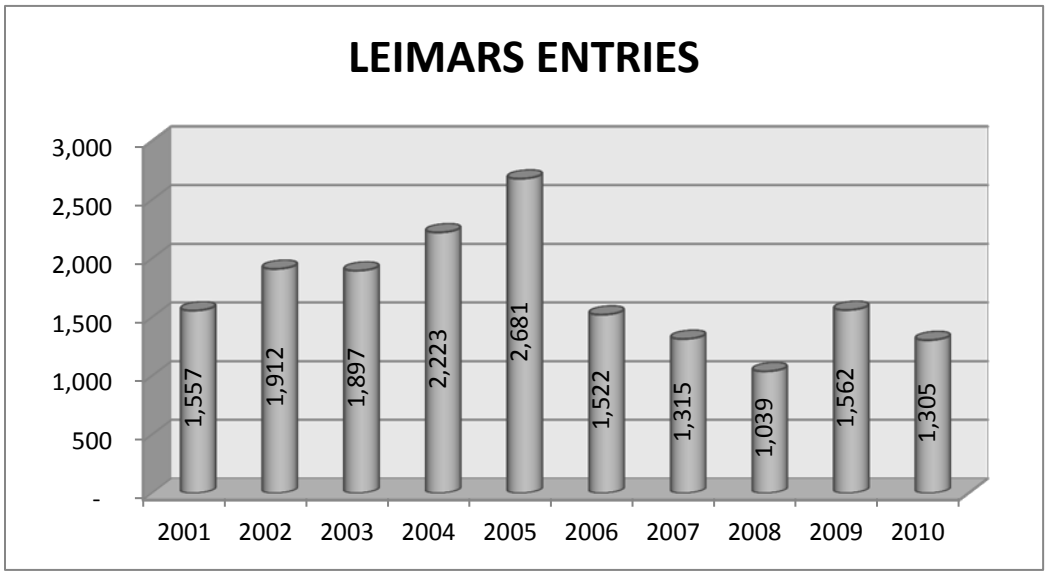


**Figure 1: Number of incidents reported in the Law Enforcement and Investigations Management Attainment Reporting System for 2001 through 2010.**

LEIMARS statistics show an increase in 2009 and 2010 from 2008 levels. However, the number of incidents reported in both years was below the 10 year average of 1,701 incidents per year. Both 2009 and 2010 had an increase in the number of marijuana gardens, the number of plants eradicated and an increasing sophistication of the drug trafficking organizations that manage the gardens.

There was also an increase in vandalism and theft of both private and public property including resource damage due to OHV use, range allotment fences, fuelwood theft and timber theft. The trend of more visitors each year to the National Recreation Area at Shasta Lake is welcome from a recreation viewpoint but it is increasingly difficult to deal with recreational violations from a law enforcement standpoint.

**Data location:** Law enforcement office, Forest headquarters, Redding, CA.

# SOCIAL AND ECONOMIC ENVIRONMENT

## Hayfork Adaptive Management Area

**Forest Plan Standard:** Development, demonstration, implementation, and evaluation of monitoring programs and innovative management practices that integrate ecological and economic values. (Ref: Forest Plan, page 4-69, Technical Objectives).

**Monitoring Objective:** To report implementation and effectiveness of actions that lead towards the goals and objectives for the Hayfork AMA.

**Method**: Identify the status and progress of multiple projects within the AMA.

**Results:** The status of two research projects, three area assessments or management plans and three vegetation management projects are described below.

*Effects of off-highway vehicles on Northern Spotted Owls:*

Information is needed on the effects of OHV use on northern spotted owl (NSO) stress levels, behavior, and nesting success. In partnership with the US Fish and Wildlife Service, the USDA Forest Service supported research by University of Washington Center for Conservation Biology (CCB) to address these issues. Data was collected within the Hayfork AMA from FY 2006 to FY 2008. The final analysis completed in 2009, included physiological samples from 165 individual NSO's on the Shasta-Trinity and Mendocino National Forests. Research results were subsequently compiled and analyzed, and results will assist in managing OHV use in owl habitat.

Research results indicate that: 1. NSO's show a physiological response to traffic exposure that varies with sex, season, breeding status and nutritional condition; 2. Reproductive success is higher close to quiet roads (likely due to higher woodrat populations). Proximity to roads with high noise (i.e. traffic) decreases NSO reproductive success. These results represent the first evidence to date that OHV use is having a strong negative impact on NSO population viability.

*Improving Northern Spotted Owl survey techniques:*

The CCB has also conducted research in the Hayfork AMA from FY2008 to FY2010 on the effectiveness of using trained dogs to detect NSO's, particularly in areas that may also be inhabited by barred owls. This species competes with and may prey on NSO's, and as a result NSO's are less likely to vocalize in the presence of barred owls. Research results suggest that trained dogs are effective in simultaneously locating spotted and barred owl roosts without vocalization, and will likely increase spotted owl detection probability and survey efficiency in the presence of barred owls. Detection dogs may be particularly useful in providing early detection of barred owls when they are less likely to exhibit territorial behaviors in response to vocalization surveys. CCB hopes to continue research in the Hayfork AMA in FY2011. More information is located at the University of Washington CCB website at: http://conservationbiology.net/research-programs/northern-spotted-owl-research-overview/#

### *Wallow Fire Assessment*

This project was initiated after the Wallow Fire in 2006 as a joint effort of the South Fork Management Unit (SFMU), Trinity County, and the Watershed Research and Training Center (WRTC) to model potential outcomes from a series of different post-fire management scenarios. We used the Forest Vegetation Simulator – Fire and Fuels Extension to project the impacts and outcomes of management interventions over time. This report was provided to the SFMU in 2008. Preparation of the Wallow Fuels Reduction project was completed in 2009 and is anticipated to be implemented in 2011.

### *Miner's Fire Assessment:*

This project was initiated as a joint effort of the SFMU and the WRTC to; investigate impacts to resource values, community wildfire safety and beneficial uses as a result of the 2008 Miner's Fire, to update the Middle Hayfork Watershed Assessment to reflect changed conditions, and to provide recommendations on future actions within and adjacent to the Miner's Fire area to protect resource values, community assets and beneficial uses. Specialists have reviewed drafts of several chapters and a full draft will be available for review at the end of January 2011. A final draft is expected by February 2011.

### *Big Creek Integrated Watershed Management Plan:*

This project was undertaken by the WRTC with funds from the State Water Board under California proposition 40. Collaboration occurred with the SFMU, private landowners, Trinity County Waterworks District #1, and other interested stakeholders through the Big Creek Collaborative to assess resource conditions in the watershed, analyze prospective threats to beneficial uses, and develop a plan for protecting beneficial uses through watershed management and restoration, thinning and prescribed fire, coordination and education. The plan was accepted by the State Water Board in 2009 and project planning and implementation has begun on private lands through Natural Resource Conservation Service programs, California State Fire Safe Council Clearinghouse grants, Bureau of Land Management investments around Ewing Reservoir. Projects completed thus far include fish passage projects on Big Creek road,

resurfacing of County and Forest Service roads, and Forest Service road closures and maintenance.

*Westside Plantation Thin:*

Collaboration has occurred with this project through several unique and related venues. Several local groups and regional stakeholders including the WRTC, Jefferson State Forest Products, the Trinity County Resource Advisory Committee, the Trinity County Fire Safe Council (TCFSC) and the Trinity Forest Restoration Collaborative (TFRC) helped to envision and prioritize the original project concept. These organizations have been established for varying lengths of time and the Forest maintains collaborative relationships with a number of them for many projects being considered.

The TFRC, while now defunct, was an organization comprised of a diverse group of local and regional entities that initially proposed the idea of conducting mid-scale NEPA planning to facilitate the thinning of older plantations at a landscape-scale to attain desired social and ecological goals across the Trinity Forest. They represented a broad base of collaborative support for the project. The project was also strongly endorsed by the TCFSC, with the original prioritization of landscape-scale plantation thinning emerging from the original Trinity County Community Wildfire Protection Plan (CWPP) community meetings, held across the county in each community at-risk beginning in 1999.

Along with this direct collaboration with external stakeholders, early on in the process the Forest worked with the Focused Science Delivery Program at the Pacific Northwest Research Station to evaluate economic variables and considerations associated with forest product retrieval on this concept.

Since the initial review period, several businesses and organizations have shared their interest and feedback in helping to find uses and markets for the biomass that will be removed from the project including the Trinity River Lumber Company, the WRTC, Wheelabrator Shasta Energy, Blue Lake Power, and area contractors. These parties have been largely supportive of both the project, and the concept of using stewardship contracting authorities to develop effective contracts that help to spur utilization and investment in biomass capacity.

Finally, the monitoring plan represents an opportunity to maintain the collaboration process throughout the life of the project. The WRTC has expressed willingness to help lead the monitoring effort through matching foundation funding and staff resources. The monitoring process will encourage community participation in the work being done, provide opportunities for stakeholders to be involved with implementation, and create a mechanism for shared-learning and adaptive management that should yield better ecological, social and economic outcomes over the life of the project.

*Hayfork South:*

This project was part of the earlier Hayfork West and South project. Prioritized in the Trinity County CWPP, the Trinity County Resource Advisory Committee (RAC) funded the NEPA planning for this project beginning in 2003. Implementation of Hayfork West was

completed in 2007, but a national-level injunction curtailed completion of the Hayfork South Fuelbreak. The SFMU worked through an agreement with the WRTC to revise the NEPA document for Hayfork South in 2009. In 2010, the WRTC worked with RAC funding to begin implementation of the Hayfork South Fuelbreak. Funding is obligated and the WRTC intends to complete the project in 2011. The SFMU then hopes to use the fuelbreak as a control line for a larger prescribed fire project to enhance wildlife habitat in the Dobbins Gulch and Bridge Gulch area beginning in 2012.

*Weaverville Community Forest:*

The Record of Decision for the Browns Project Environmental Impact Statement was signed in June, 2009. Collaboration has been on-going between the Forest Service, the Weaverville Community Forest steering committee, and the Trinity County Resource Conservation District (RCD). Phase I was awarded in September 2010, which includes road upgrades and fuel reduction projects, including mastication after timber harvest. The stewardship contract also includes biomass utilization.

**Recommendations:** Continue monitoring on-going projects. Provide opportunities and processes for information sharing so lessons learned can be evaluated for use in the next generation of AMA projects.

**Public Involvement:** Public involvement has occurred both during collaboration efforts and the NEPA process.

**Data Location:** South Fork Management Unit, Hayfork, CA

## Community Development and Partnerships

**Forest Plan Standard:** Emphasize the development of partnership programs through coordination with interested public and agencies (Ref: Forest Plan, page 4-5, #28).

**Monitoring Objective**: To determine if the Forest is utilizing opportunities to collaborate with a variety of interested publics and agencies.

**Methods**: Query I-WEB grants and agreements module to determine the types of agreements being executed and collaborators involved. Summarize Resource Advisory Committee projects located on or adjacent to the Forest.

**Results**: In FY 2009, the Forest executed 92 new agreements. There were 58 new agreements executed in FY 2010. These exceeded the number of agreements executed in each of the two previous fiscal years. Table 1 shows the number of agreements in each category for each fiscal year.

Partnerships included grants and agreements with over 30 different partners in both FY 2009 and FY 2010. Some of these include: the Resource Advisory Committees, Caltrans, California Conservation Corps, Trinity County Resource Conservation District, Bureau of Reclamation, Western Area Power Administration, the State of California, Shasta College, the Watershed Research & Training Center, Resource Conservation Districts, Volunteer Fire Departments, and the Back Country Horsemen of California.

**Table 1: New grants and agreements executed for the Shasta-Trinity National Forest separated by type and fiscal year.**

| Type | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|
| Domestic Grants | 2 | 4 | 5 | 3 |
| Collection Agreements | 3 | 4 | 11 | 8 |
| Participating Agreements | 24 | 17 | 35 | 21 |
| Challenge Cost Share Agreements | 14 | 11 | 22 | 7 |
| Interagency Agreements | 7 | 7 | 16 | 6 |
| Memorandum of Understanding | 4 | 3 | 3 | 0 |
| Fire Agreements | 0 | 1 | 0 | 13 |
| Cost Recovery Agreements | 1 | 1 | 0 | 0 |
| **Total** | **55** | **48** | **92** | **58** |

Specific examples of projects that involved collaboration with other organizations can be found throughout this document under many of the specialty areas.

Resource Advisory Committees (RAC):

In October 2000, Congress passed Public Law 106-393 entitled "Secure Rural Schools and Community Self Determination Act of 2000" which stabilized federal payments to states for funding schools and roads.

The Act established the committees consisting of 15 local citizens representing a broad array of backgrounds, interests, and experiences. Each year the Resource Advisory Committees recommend projects to the Forest Service to be conducted on Forest Service system lands, or that will benefit resources on Forest Service system lands. For more information visit the Forest website at: http://www.fs.fed.us/r5/shastatrinity/home-page/rac.shtml.

Table 2 outlines the number of projects funded by each RAC by fiscal year and the associated cost. A majority of these projects were implemented on lands managed by the Forest; however, a few were implemented on state or private lands, or on adjacent National Forests.

**Table 2: Status of RAC projects within and adjacent to the Shasta-Trinity National Forest and associated funding requests for each fiscal year.**

| County | RAC Status | 2009 | | 2010 | |
|---|---|---|---|---|---|
| | | # Projects | Cost | # Projects | Cost |
| Trinity | Approved | 19 | $ 481,478 | 25 | $ 743,100 |
| Shasta | Approved | 2 | $ 137,000 | 6 | $ 194,587 |

RAC funded projects included youth programs, road maintenance, fish passage, noxious weed management, trail maintenance, and vegetation/fuel management projects.

**Public Involvement:** Interested publics are directly involved with development and/or implementation of agreements.

**Data location:** Grants and Agreements department, Forest headquarters, Redding, CA.

Resource Advisory Committee information retrieved from: https://fsplaces.fs.fed.us/fsfiles/unit/wo/secure_rural_schools.nsf/Web_Projects_by_RAC?OpenView&Count=1000.

## Tribal Relations Program

**Forest Plan Standard:** Develop partnerships with Native American tribes and consult with Native Americans at the planning and project level of analysis. (Ref: Forest Plan page 4-4 #7, and page 4-50, #4)

**Monitoring Objectives:** The objective of monitoring the Tribal Government Program is to determine if partnerships and the consultation process are established and serving to improve relationships, communication and understanding between the Forest Service and Indian people.

**Methods:** Memoranda of understanding are signed with the Pit River Tribe, the Shasta Nation, the Redding Rancheria, and the McCloud Wintu. Annual meetings are held with recognized tribes and Native Americans are consulted during scoping and watershed analysis where there are issues of concern. Non recognized tribes are also included during NEPA and Section 106 consultation. All tribal groups need to be involved and informed on District and Forest management potentially affecting them.

**Results**: In FY 2009 and FY 2010, consultation continued with Native Americans for projects such as timber sales, special use permits and recreation site improvements. Native American consultations have been productive in resolving issues arising during project planning. Some projects were modified following consultations. Native Americans are interested in both historical places and areas of current use on the Forest. The Pit River Tribe, the McCloud Wintu and the Hayfork Wintu continue to be the most actively involved tribal groups. For more information related to these objectives, refer to the Sec 106 PA Heritage Resource Management Report for FY 2009 and FY 2010 prepared by the Forest Archeologist.

The Forest has worked with the tribes to manage significant places and resources. Management is on-going for the sacred site of Natural Bridge with the Nor-Rel-Wintu tribe and Ironside Mountain with the Tsnungwe. Projects implemented in 2009 included aspen release at Toad Lake and bear grass burning on Horse Ridge.

The Heritage Program on the Trinity Side continues to participate in interpretation and educational activities with the local Native American community. A primary example of this is the annual Native American Day held each Fall that takes local third grade students and educates the children on various aspects of local Indian culture and archaeology.

**Recommendation:** Continue consultations and partnerships at current level. Continue to further close personal contacts with tribal members to help preserve and educate the general public on their history and culture.

**Public Involvement**: Direct involvement with tribes and their members concerning various resource issues.

**Data location:** Heritage department at Forest headquarters, Redding, CA.

# RESOURCE MANAGEMENT PROGRAMS

## Fire and Fuels

### *Hazard Fuels Treatments and Strategic Planning*

**Forest Plan Standard:** Natural fuels will be treated in the following order of priority: 1) public safety; 2) high investment situations (structural improvements, power lines, plantations, etc.); 3) known high fire occurrence areas; and 4) coordinated resource benefits, such as ecosystem maintenance for natural fire regimes. (Ref: Forest Plan, page 4-17, #8e)

Prescribed Fire Monitoring

**Objective:** Prescribed fire monitoring is ongoing as is the collection and analysis of repeated observations and/or measurements to evaluate changes in condition and progress toward meeting project objectives. The following elements are monitored: weather (forecast and observed), fire behavior, fuels information and smoke dispersal.

**Methods:** On site observations were made for the Green Mountain project area, documented and evaluated against the approved plan and purpose and need identified for the project, namely to provide for the protection, enhancement and restoration of habitat for elk, deer, turkey populations and bald eagle nest territories while reducing the chance of catastrophic wildfire through the use of prescribed fire. For each implementation, a monitoring process utilizing FIREMON protocols for pre-treatment, immediate post-treatment and 3 year intervals following treatment is used to determine pre-existing condition, first order fire effects related to objectives in the prescribed fire plan and subsequent monitoring for identifying maintenance needs within fire return intervals.

Another project, White Deer Lake, on the Shasta McCloud Management Unit, was burned in 2009. The objectives were meadow restoration and protection of tadpole shrimp.

**Results:** The results are used to determine appropriateness of continuing project implementation as well as improvements that can be applied to future projects. The outcome of the Green Mountain project is a mosaic pattern across the landscape. Initial monitoring of post treatment sites indicate that prescribed fire is successful at reducing the dead fuel loading, minimizing understory growth and stimulating forage for game species while reducing the possibility of catastrophic wildfire. The monitoring protocol requires recurring site visits to determine the frequency of maintenance treatments and to determine success of long term objectives outlined in the forest land management plan. For the White Deer Project, fuels reduction was effective, grass response has been

positive and aspen response continues to be monitored in an enclosure area and the surrounding meadow.

**Recommendation:** Continue to use prescribed fire to mitigate the effects of increased fuel loading on the landscape and to re-introduce fire as an ecological process. Opportunities should be taken to use this treatment methodology in other areas where appropriate.

**Public Involvement:** Support and funding for this project come from the Rocky Mountain Elk Foundation and the Shasta County Air Quality Management District. The public is involved through public outreach using area Fire Safe Councils, news releases and other outlets including during NEPA analysis.

**Data Location:** Monitoring data is maintained on each Management Unit in the Project File.

Vegetation Treatment Monitoring:

**Objective:** Monitor the effectiveness of various vegetation treatments on the forest.

**Monitoring Objective:** Determine the effectiveness of various fuels and vegetation management treatments that meet land management objectives while being economically feasible.

**Methods:** An example on the Shasta McCloud Management Unit is biomass removal that resulted in reduction of ladder fuels and a beneficial rearrangement of surface fuels which aided in reducing the potential fire hazard on these sites. Several sites of both natural and activity fuels which traditionally would have been piled and burned were sold as biomass under a mutually beneficial joint fuels and timber contract. Examples on the Trinity River Management Unit are China Gulch Fuels Reduction and Musser Hill fuel management zone (FMZ) Pruning Project. The China Gulch project implemented 147 acres of thinning, hand piling and pile burning in natural stands. The project was funded by the Trinity County Resource Advisory Committee and completed by the Trinity County Resource Conservation District. For the Musser Hill FMZ Pruning Project, 84 acres of pruning along the Musser Hill Road have occurred. Funding and completion were the same as China Gulch.

**Results:** For the biomass project, a 2400-2 Timber Sale Contract was incorporated into a Fuels Reduction Service Contract and resulted in the successful removal and utilization of approximately 1000cubic feet of slash. China Gulch and Musser Hill were successfully completed and meet project objectives while using collaborative efforts.

**Recommendation:** Continue Forest efforts to use a variety of treatment types, collaboration with local communities, project design and implementation to improve vegetation treatment outcomes and provide for community involvement, while using local organizations' expertise to compliment Forest Service activities.

**Public Involvement:** Public involvement was accomplished through project noticing and standard contract advertising procedures for biomass activities. Other projects involved RAC, RCD, Fire Safe Council and local community involvement.

**Data Location:** Local Management Units.

### *Activity Fuels*

**Forest Plan Standard:** Activity fuels that remain after meeting wildlife, riparian, soil, and other environmental needs will be considered surplus and a potential fire hazard. The amount and method of disposal will be determined in ecosystem analysis. (Ref: Forest Plan, page 4-17, #8c)

**Monitoring Objectives:** Monitor and evaluate the effectiveness of fuel treatments designed to treat excess activity fuels.

**Methods:** Proposed treatment areas were visited prior to logging during the NEPA process. Fuels inventories, photo series assessment, and team expertise were used to estimate the amount of activity fuels likely to be generated on a unit-by-unit basis for the project area. If there were no plans for reforestation; activity fuels were treated to meet hazard reduction objectives. In areas of reforestation, fuels specialists and silviculturists worked together to prescribe the appropriate method of fuel treatment. All treatments, both for hazard reduction and site-prep, were developed by project interdisciplinary teams.

**Results:** Multiple projects were implemented and monitored across the Forest during the reporting period. One example is on the Shasta McCloud Management Unit, McIntosh Project which was implemented and monitored during 2009 and 2010. The burn resulted in a mosaic pattern across the landscape meeting objectives project wide. On site observations resulted in a general agreement from the interdisciplinary team that burning within a few years after timber harvest is desirable to limit residual large tree scorch. SMMU burned approximately 1,000 additional acres each fiscal year with brush disposal funding. Post burn monitoring determined that objectives were met at an acceptable level.

**Recommendation:** Continue to carefully monitor the timber sale brush disposal program and fuels activity program, to assess whether the pre-sale estimated work adequately meets the needs of Forest Plan standards and recommendations for the post-harvest outcome. Continue to consider all types of treatments for activity fuels, including biomass utilization.

**Public Involvement:** Field trips with local citizens groups and industry representatives are conducted to review timber sale areas. Biomass experts have met on site and discussed and considered economics for utilization.

**Data location:** Activity fuels information and burn plans are located at local Management Unit Offices, Forest headquarters in Redding and Redding Interagency Command Center. Post-burn summaries are located at the local Management Unit Offices.

## Timber Management

### *Allowable Sale Quantity (ASQ)*

**Forest Plan Standard:** Timber yields from suitable lands will be chargeable toward the ASQ. The suitability of land for timber production will be field verified at the project level using the timber suitability criteria shown in Appendix I of the Forest Plan. (Ref: Forest Plan page 4-26, #20a)

**Monitoring Objective:** Determine if the timber sold in FY 2009 and FY 2010 meets the ASQ level specified in the Forest Plan.

**Method/Data Collected:** Information on timber products offered and sold is collected at the district level and compiled at the forest level into a national database called the Timber Information Management System (TIM).

**Results:** The timber volume awarded in FY 2009 totaled about 14.8 MMBF. This was lower than the 82.0 MMBF allowable sale quantity as stated in the Forest Plan. The average annual timber volume awarded since the signing of the Forest Plan in 1995 is about 54.8 MMBF, or about 70% of the ASQ. In FY 2010, 10.4 MMBF was awarded. This reduced the average annual timber volume awarded since 1995 to 49.5 MMBF, which is approximately 60% of the ASQ.

**Recommendations:** Continue monitoring annually to determine the average annual output for the period of the Plan.

**Public Involvement:** Public involvement occurs during NEPA at the project level.

**Data Location:** The TIM report can be accessed through Forest Service computers.

### *Silvicultural Systems*

**Forest Plan Standard:** Silvicultural Systems/Harvest Methods. Emphasize the regeneration harvest of understocked and poorly growing stands, whether using even or uneven-aged systems. Intermediate cuttings in overstocked stands (thinning) and the salvage of dead and dying trees will also be emphasized. (Ref: Forest Plan page 4-26, #20e)

**Monitoring Objective:** The objective is to determine if silvicultural systems and harvest methods prescribed in timber sales are following the prescriptions specified in the Forest Plan.

**Method:** Information was compiled through review and collection of volume per acre data from individual timber sale Environmental Assessments (EAs) and contracts sold.

**Data Collected:** Volume and acres of regeneration cutting and intermediate (thinning) and salvage cutting in timber sales.

**Results:** The Forest did not meet annual regeneration or intermediate cutting objectives, but exceeded the salvage cutting objectives in both fiscal years, as shown in table 3.

**Table 3: Timber accomplishments for each fiscal year by harvest type.**

| Harvest Type | Forest Plan Objective | FY 2009 Accomplishment | FY 2010 Accomplishment |
|---|---|---|---|
| Regeneration Cutting-Volume (MBF) | 66,000 | 0 | 1,890 |
| Regeneration Cutting-Acres | 3,500 | 0 | 189 |
| Intermediate Cutting-Volume (MBF) | 12,000 | 3,219 | 1,219 |
| Salvage Cutting-Volume (MBF) | 4,000 | 11,588 | 7,256 |

**Recommendations:** The Forest would have to place additional emphasis on regeneration cutting in the future in order to meet long-term sustained yield timber objectives as specified in the Forest Plan.

**Public Involvement:** Public involvement occurs during NEPA at the project level. Extensive public involvement occurred during the preparation of the Forest Plan.

**Data Location:** Timber sale EAs and contracts are at Forest headquarters, Redding, CA.

### *Reforestation*

**Forest Plan Standard:** Achieve stocking standards of well distributed trees within five years of final harvest (unless otherwise certified by a certified silviculturist as meeting ecosystem objectives) under all silvicultural methods. (Ref: Forest Plan page 4-26, #20g)

**Monitoring Objectives:** The objectives are to 1) determine if reforestation goals are being met, and 2) determine if regeneration harvest areas are being adequately stocked within five years.

**Method:** Information on reforestation accomplishment and regeneration status was taken from the FACTS.

**Data Collected:** FY 2009 and 2010 reforestation acres accomplished and FY 2004 and 2005 regeneration harvest acres certified for reforestation in FY 2009 and 2010.

**Results:** Reforestation acres accomplished totaled 711 acres in 2009 and 3,093 acres in 2010. This is about 20% and 88% respectively of the 3,500 acres projected in the Forest Plan. Forest emphasis on thinning and salvage more than regeneration cutting during the past few years has kept reforestation acres low.

**Recommendations:** Continue monitoring annually.

**Public Involvement:** No direct involvement.

**Data Location:** The data resides in the National FACTS Database.

### *Timber Stand Improvement*

**Forest Plan Standard:** Timber stand improvement (TSI) projects will emphasize maintaining or improving growth, and healthy, vigorous trees, through release and thinning. (Ref: Forest Plan page 4-27, #1)

**Monitoring Objective:** Determine if timber stand improvement goals are being met.

**Method:** Information on TSI accomplishment was taken from the FY 2009 and 2010 FACTS National Database.

**Data Collected:** TSI acres accomplished.

**Results:** TSI acres accomplished totaled 3,623 acres in 2009 and 4,514 acres in 2010. This was less than the 5300 acres (68% and 85% respectively) projected in the Forest Plan.

**Recommendations:** Continue monitoring annually.

**Public Involvement:** No direct involvement.

**Data Location:** The data resides in the National FACTS Database.

### *Biomass*

**Forest Plan Standard:** Incorporate biomass opportunities into ecosystem analysis and project proposals that meet ecosystem objectives, such as dead/down material for wildlife and ground cover for soil protection, and to reduce fuel loading to complement the natural fire regime. (Ref: Forest Plan page 4-14, #3a)

**Monitoring Objective:** Determine if biomass opportunities have been incorporated into project proposals.

**Method:** Information on biomass volume offered and sold was compiled through the review and collection of volume data from timber sale contracts sold in 2009 and 2010.

**Data Collected:** Volume of biomass sold in FY 2009 and FY 2010.

**Results:** No specific volume targets for biomass were established in the Forest Plan. In 2009 approximately 82 MBF (6%) of biomass sold as part of the Forests' regular timber sale program of 14,807 MBF. The Forest's regular timber sale program fell to 10,365 MBF in 2010, of which, 829 MBF (8%) was sold as biomass. Biomass opportunities have been emphasized more on the east side of the Forest. Biomass opportunities have been limited on the west side of the Forest, primarily due to economic considerations. Biomass totals for this report are the totals of Non-saw (08), Misc-Conv (14), and cull ogs (18) from the Cut and Sold report. It does not include salvage volume or fuelwood (07). Fuelwood is reported as salvage volume accomplishment.

**Recommendations:** In the future, greater priority should be placed on sawlog volume when allocating timber dollars. Biomass opportunities should be multi-funded, using fuels, wildlife, ecosystem management, and other funding sources along with timber dollars to accomplish biomass removal projects.

**Public Involvement:** Public involvement occurs during NEPA at the project level.

**Data Location:** Timber sale contracts at Forest headquarters, Redding, CA.

## Forest Health and Protection

**Forest Plan Standard:** When conducting watershed/ecosystem analysis, consider the possible effects that Forest pests may have on management objectives and desired future conditions. (Ref: Forest Plan, page 4-18, #10a).

**Objective:** To identify the location and extent of insect induced conifer mortality.

**Methods:** Aerial detection surveys are flown on an annual basis to document acres of mortality, defoliation and disease. Northern California Shared Service Area also has both a forest entomologist and plant pathologist who monitor insect and disease infestations across the Forest.

**Results:** The 2009 Water Year (October 1, 2008 through September 30, 2009) was the third consecutive year of below average precipitation for the state with the annual statewide precipitation totaling only 76 percent of average for Water Year 2009. By summer 2010 (well into Water Year 2010), hydrologic conditions had improved significantly in comparison due primarily to late cold Pacific storms that brought precipitation and snowpack conditions to above average levels through most of Shasta and Siskiyou counties. Although 2009 aerial detection surveyors mapped a statewide increase in acres of conifer mortality attributed to bark beetles compared to 2008, there was a slight decrease in number of acres of conifer mortality from bark beetles on the Forest (33,345 in 2009 compared to 39,198 acres in 2008) but an increase in intensity (measured in number of trees affected – 130,535 in 2008 compared to 147,930 trees in 2009).

The 2010 aerial survey showed an increase in number of acres of bark beetle-caused mortality in certain areas across the Forest which, due to typical bark beetle life cycles and tree fading patterns, can be attributed to bark beetle attacks in 2009. Also, much of the western pine beetle-caused mortality in the Forest is associated with root diseases in the McCloud Flats area. Spread and expression of black stain root disease can be increased by cool wet conditions and has historically resulted in an increase in western pine beetle activity in that area.

Port-Orford-cedar (POC) root disease remains a concern in Shasta and Siskiyou Counties. The Scott Camp Creek eradication project (3 acres of POC removal dating 2003-2005) appears to have been successful as stream baits have been negative for the disease in 2009 and 2010. A new disease center, approximately 10 acres in size, has been identified on private land near Dunsmuir at St. Germaine. USFS pathologists will provide input on management alternatives.

**Recommendation:** Continue annual surveys and monitoring.

**Public Involvement:** No direct involvement.

**Data Location:** Forest Health Protection Shared Service Area Office at Forest Headquarters, Redding, CA.

# Range Management

## *Sustainability of Forage*

**Forest Plan Standard:** Manage rangeland vegetation to provide for healthy ecosystems and to make forage available on a sustainable basis for use by livestock and wildlife. (Ref: Forest Plan, page 4-5, #21a)

**Monitoring Objective 1:** The objective is to compare the actual forage use by livestock to the projected forage use by livestock specified in the Forest Plan (page 4-9). Actual use is tracked by billing documents and allotment inspections.

**Results**: In 2009, there were active grazing permits to authorize 3,127 animal-months and actual use was 2,502 animal-months.

In 2010, there were active grazing permits to authorize 3,333 animal-months (i.e., head-months) and actual use was 2,339 animal-months. The projected average annual output from the Forest Plan is 8,300 animal-months.

**Recommendations:** Continue to monitor permitted and actual use to determine average annual use over time.

**Public Involvement:** Public involvement occurs during NEPA at the forest plan and the project level.

**Data Location:** Forest Headquarters, Redding, CA.

**Monitoring Objective 2:** The objective is to monitor livestock distribution and forage utilization to determine compliance with the Forest Plan utilization standards (Ref: Forest Plan, page 4-23, #15r).

**Results**: In 2009, all eleven allotments that were stocked with livestock were monitored for forage utilization and livestock distribution. Eight allotments met Forest Plan standards and guidelines for forage utilization at each monitoring location. Three allotments exceeded Forest Plan Standards and guidelines for forage utilization for at least one monitoring location.

In 2010, all ten allotments that were stocked with livestock were monitored for forage utilization and livestock distribution. All ten allotments met Forest Plan standards and guidelines for forage utilization at each monitoring location.

**Recommendations**: Continue to monitor utilization and livestock distribution to ensure continued sustainable forage availability for livestock and wildlife. Take proactive livestock management measures when monitoring data indicates that they are necessary to ensure continued compliance with Forest Plan forage utilization standards.

**Public Involvement:** Public involvement occurs during NEPA at the forest plan and the project level.

**Data Location:** Forest Headquarters, Redding, CA.

**Monitoring Objective 3:** The objective is to determine whether range conditions are sufficiently advanced in the season in terms of soil moisture and plant phenology to allow grazing at the start of the permitted season of use.

**Results**: In 2009, of the eleven allotments that were stocked with livestock, one was monitored for range readiness.

In 2010, nine of the ten allotments that were stocked with livestock were monitored for range readiness. The one allotment that was not monitored is known to follow similar seasonal weather patterns as nearby allotments that were monitored. Nine of the allotments that were stocked with livestock were determined to be ready for livestock grazing at the start of the permitted season. One allotment was determined to be not-ready in portions of its range and the livestock turn-out date was delayed by two weeks.

**Recommendations**: Continue to monitor range readiness to ensure continued maintenance of healthy ecosystems. Maintain awareness of how range readiness is affected by climate change.

**Public Involvement:** Public involvement occurs during NEPA at the forest plan and the project level.

**Data Location:** Forest Headquarters, Redding, CA.

### *Range Improvements*

**Forest Plan Standard:** Manage rangeland vegetation to provide for healthy ecosystems and to make forage available on a sustainable basis for use by livestock and wildlife. Manage livestock grazing activities to meet desired ecosystem conditions to the extent that such activities do not adversely affect attainment of the Aquatic Conservation Strategy or Riparian Reserves (Ref: Forest Plan, page 4-5, #21a-b)

**Monitoring Objective 1:** Based on resource needs identified through monitoring, implement range improvements.

**Results**: In 2009, one fence was constructed, protecting about 172.0 acres of riparian area. In 2010, two exclosure fences were constructed, protecting about 0.3 acres of sensitive plant habitat.

**Recommendations**: Identify needs for additional range improvements based on monitoring data and environmental analysis.

**Public Involvement:** Range improvement construction is coordinated with permittees. Public involvement occurs during NEPA at the project level.

**Data Location:** Forest Headquarters, Redding, CA.

**Monitoring Objective 2:** Inspect and maintain existing range improvements for resource protection.

**Results**: In 2009, eleven existing range improvements were inspected and maintained, protecting about 1,879 acres of riparian or otherwise sensitive habitat.

In 2010, fifteen existing range improvements were inspected and maintained, protecting about 2,055 acres of riparian or otherwise sensitive habitat.

**Recommendations**: Continue to inspect and maintain range improvements in coordination with permittees.

**Public Involvement:** Range improvement maintenance is coordinated with permittees.

Public involvement occurs during NEPA at the project level.

**Data Location:** Forest Headquarters, Redding, CA.

### *Allotment Management Plans*

**Forest Plan Standard:** Manage rangeland vegetation to provide for healthy ecosystems and to make forage available on a sustainable basis for use by livestock and wildlife. Manage livestock grazing activities to meet desired ecosystem conditions to the extent that such activities do not adversely affect attainment of the Aquatic Conservation Strategy or Riparian Reserves (Ref: Forest Plan, page 4-5, #21a-b)

**Monitoring Objective:** Monitor to determine whether or not Allotment Management Plans and Permit Terms and Conditions are being implemented and followed properly.

**Results**: In 2009, all eleven allotments that were stocked with livestock were monitored for compliance with Allotment Management Plans and Term Grazing Permit Terms and Conditions. In 2010, all ten allotments that were stocked with livestock were monitored for compliance with Allotment Management Plans and Term Grazing Permit Terms and Conditions.

**Recommendations**: Continue to monitor implementation and compliance with Allotment Management Plans and Permit Terms and Conditions. Continue to develop Allotment Management Plans through project level NEPA analysis for those active allotments that do not have project-level NEPA analysis completed and for those allotments for which monitoring data indicate a need or opportunity for significant modifications to Allotment Management Plans.

**Public Involvement:** Allotment Management Plans are tiered to project level NEPA decisions and developed in cooperation with permittees. Public involvement occurs during NEPA at the project level.

**Data Location:** Forest Headquarters, Redding, CA.

**Table 4: Range activities associated with Forest Plan Monitoring Action Plan by fiscal year.**

| Standard or Objective | Activity | 2009 Accomplishments | 2010 Accomplishments |
|---|---|---|---|
| Manage rangeland vegetation to provide for healthy ecosystems and to make forage available on a sustainable basis for use by livestock. (4-5) | Actual use by livestock | 2,502 animal-months: 30% of projected average annual use | 2,339 animal-months: 28% of projected average annual use |
| Manage rangeland vegetation to provide for healthy ecosystems and to make forage available on a sustainable basis for use by livestock. (4-5) | Monitor livestock distribution and forage utilization | 11 of 11 allotments stocked with livestock monitored | 10 of 10 allotments stocked with livestock monitored |

| Standard or Objective | Activity | 2009 Accomplishments | 2010 Accomplishments |
|---|---|---|---|
| Manage rangeland vegetation to provide for healthy ecosystems and to make forage available on a sustainable basis for use by livestock. Manage livestock grazing activities to meet desired ecosystem conditions to the extent that such activities do not adversely affect the attainment of the Aquatic Conservation Strategies or Riparian Reserves. (4-5) | Monitor range readiness before livestock are turned out | 1 of 11 allotments stocked with livestock monitored | 9 of 10 allotments stocked with livestock monitored |
| Manage rangeland vegetation to provide for healthy ecosystems and to make forage available on a sustainable basis for use by livestock. Manage livestock grazing activities to meet desired ecosystem conditions to the extent that such activities do not adversely affect the attainment of the Aquatic Conservation Strategies or Riparian Reserves. (4-5) | Construct range improvements | 1 exclosure fence, 172.0 acres | 2 exclosure fences, 0.3 acres |
| Manage rangeland vegetation to provide for healthy ecosystems and to make forage available on a sustainable basis for use by livestock. Manage livestock grazing activities to meet desired ecosystem conditions to the extent that such activities do not adversely affect the attainment of the Aquatic Conservation Strategies or Riparian Reserves. (4-5) | Inspect and maintain range improvements | Inspected and maintained 11 existing fences, protecting 1,879 acres | Inspected and maintained 15 existing fences, protecting 2,055 acres |
| Manage rangeland vegetation to provide for healthy ecosystems and to make forage available on a sustainable basis for use by livestock. Manage livestock grazing activities to meet desired ecosystem conditions to the extent that such activities do not adversely affect the attainment of the Aquatic Conservation Strategies or Riparian Reserves. (4-5) | Monitor allotments to ensure compliance with Allotment Management Plans and Permit Terms and Conditions | 11 of 11 allotments stocked with livestock monitored | 10 of 10 allotments stocked with livestock monitored |

# BIOLOGICAL ENVIRONMENT

## Fisheries Management

### *Sport Fisheries*

**Forest Plan Goal:** Emphasize sport fisheries as a major recreational activity by expanding recreational fishing opportunities. (Ref: Forest Plan Goals, page 4-4, # 12).

### Habitat Improvement

**Monitoring Objective**: To determine fish response and abundance related to habitat improvement treatments compared with untreated areas in Shasta and Trinity Lakes.

**Methods and Results:** There were 165 acres of underwater lake habitat improved in 2010 for sport fisheries benefit in Shasta Lake, and 75 acres improved in Trinity Lake; fifteen additional acres of treatment elsewhere led to 255 acres enhanced on the Forest in total. For 2009, 170 acres were treated in Shasta Lake and 70 acres improved in Trinity Lake (300 acres total on the Forest including smaller ponds/lakes/wet areas). Included are the placement of underwater manzanita brush structures, rooted willow plantings, and acres of annual cereal grass seeding. Fish utilization abundance was monitored at the Shasta Lake improvement sites via scuba diving accompanied with underwater photography. Fish abundance continues to range from three to ten times greater in these treatment areas compared to untreated control areas. The cereal grass benefited newborn young-of-the-year fishes primarily.

**Public Involvement:** 1) Several acres of fish habitat were improved both years with contributions by children of Bella Vista Elementary School. Many parent chaperones and teachers participated. 2) School classroom presentations were made during National Fishing week both years, in combination with a fishing trip for the children to the upper portions of Trinity Lake. More fish were caught than the number of students participating.

### Raise and Release

**Monitoring Objective:** Raise and release 'trophy' sized trout for anglers on Shasta, Trinity and Lewiston Lakes.

**Methods and Results:** Each year, approximately 700 trout per cage are raised in 11 cages on Shasta, Trinity, and Lewiston Lakes. Most of the fish are between 2 to 5 lbs at the time of release. Once released, these fish can continue growth up to 17 pounds as per a catch in Lewiston Lake. The Forest's recreational fishing opportunities are viewable at: http://www.fs.usda.gov/activity/stnf/recreation/fishing

**Public Involvement:** Numerous partners contribute time, money and other resources to help make this a very satisfying experience for the angling public.

**Data Location:** Forest Headquarters, Redding, CA.

## *Summer Steelhead and Spring-run Chinook Salmon Habitat*

**Forest Plan Goal:** Emphasize the restoration of summer steelhead and spring-run Chinook salmon habitat in the South Fork Trinity River Basin. (Ref: Forest Plan Goals, page 4-4, #13)

**Methods and Results:** South Fork Trinity River spring-run Chinook salmon adult surveys have been conducted repeatedly since 1964 via snorkeling and the counting of spawning redds. The California Department of Fish and Game coordinates this survey and staff from the Forest participates every year, including 2009 and 2010.

In 2009 surveyors counted 118 adult spring-run Chinook, and 94 steelhead. In 2010 surveyors counted 120 spring-run Chinook and 88 steelhead. These results are less than what was reported in 2007, the most recent previous year of surveying. The 2010 surveys included three reaches (15.3 miles in length) on Lower Hayfork Creek, which had not been surveyed for close to a decade. This portion of the survey led to three adult spring-run Chinook and eleven adult steelhead being observed.

During the reporting period, staff from the Pacific Southwest Research Stations Redwood Sciences Lab surveyed juvenile steelhead densities along West Weaver Creek on the TRMU.

**Data Location:** Forest Headquarters, Redding, CA.

### *Wild Trout and Salmon*

**Forest Plan Goal:** Provide for the protection, maintenance, and improvement of wild trout and salmon habitat. (Ref: Forest Plan Goals, page 4-4, #14)

**Methods and Results:** Seven aquatic inventories were conducted using the Stream Condition Inventory (SCI) method over the two year period (Table 5). Over three miles of stream were surveyed. However, both the number of surveys and the miles surveyed decreased from 2007 and 2008 levels. Eleven salmon/steelhead redd and/or spawning surveys were conducted in 2009; while 13 were done in 2010 (Table 6).

**Table 5: Locations and distances of Stream Condition Inventory (SCI) completed in FY 2007 thru FY 2010.**

| Year | Location(s) | Total Miles Surveyed |
|---|---|---|
| 2007 | Connor Creek, West Weaver Creek, Soldier Creek, Little Browns Creek, Barker Creek, Boulder Creek, Big French Creek, North Fork Trinity River, Rush Creek, Nelson Creek, Big Creek, Butter Creek, Indian Valley Creek, & Cottonwood Creek | 12.0 |
| 2008 | Manzanita Creek, Little Browns Creek, East Fork North Fork Trinity River, Dutch Creek, Tangle Blue Creek, Little Trinity River, & Picayune Creek | 4.1 |
| 2009 | Brown's Creek | 0.25 |
| 2010 | Indian Valley Creek, Maple Creek, Shell Mountain Creek, Canyon Creek, Stuart's Fork, & Little French Creek | 3.08 |

Basic benthic macroinvertebrate index sampling is conducted on the Forest as part of the SCI protocol. The Forest continues to encourage macroinvertebrate sampling conducted by other organizations across the Forest.

A Redband Trout Conservation Agreement was originally established over ten years ago with a revised draft being circulated today for interagency or entity signatures. The purpose of the Agreement is to meet this Forest Plan Goal. Forest Service fisheries personnel conduct annual redband trout population surveys in Trout Creek and one or more adjacent streams containing redband trout. The sampling method is via electro-shocking. All relevant measurements are taken for each fish collected in order to not only compare trends in long term population numbers, but the condition of the sampled fish as well. Non-native introduced brown trout, which compete directly with redband trout for resources, are removed from the stream system after capture and measurement.

Stream restoration work was also conducted both years in Trout Creek, a tributary of the McCloud River harboring the rare redband trout in the form of:

1. Gravel was introduced to the creek in both years for the purpose of armoring and providing a fresh load of spawning material to the channel below the large backwater pool which traps all sediment.
2. Streamside riparian zones were planted with vegetation in selected reaches in 2009 to continue a trend started in the preceding few years.
3. A large-scale mulching/planting project occurred in 2010 for the purpose of re-vegetating the borrow pits that were created when a gully was 'plugged' in a previous year.
4. Fences and an exclosure were either built or rebuilt around the Trout Creek campground in 2009 to protect redband trout.

**Table 6: Results of annual fisheries surveys for FY 2007 thru FY 2010.**

| Survey Type | Location | Results | | | |
|---|---|---|---|---|---|
| | | 2007 | 2008 | 2009 | 2010 |
| Spawn/Redd | Deadwood Creek | 65 Coho redds; 12 Chinook redds | 5 redds; 3 Chinook, 2 coho | No Survey | 26 redds (4 CH, 22 CS), 10 live CH, 21 live CS |
| Spawn/Redd | Rush Creek | 6 Coho redds; 7 Chinook redds | 3 redds, 0 fish | 7 redds (7 CH), 9 live CH | 5 redds (4 CH, 1 CS), 11 live CH, 3 live CS. |
| Spawn/Redd | Dutch Creek | 0 redds; 0 fish | 0 redds, 0 fish | 0 redds, 0 fish | 0 redds, 0 fish |
| Spawn/Redd | Soldier Creek | 0 redds, 0 fish | 0 redds, 0 fish | 0 redds, 0 fish | 0 redds, 0 fish |
| Spawn/Redd | East Fork North Fork Trinity | 1 Coho redd; 29 Chinook redds | 55 Chinook redds | 18 redds, 21 live CH | 22 redds (22 CH), 32 live CH |
| Spawn/Redd | North Fork Trinity River | 43 redds; 27 live CH | 25 Chinook redds | 18 redds (CH), 13 live CH | 25 redds (25 CH), 24 live CH |
| Spawn/Redd | Eltapom Creek | No Survey | No Survey | No Survey | 19 redds (CH), 12 live CH |

| Survey Type | Location | Results | | | |
|---|---|---|---|---|---|
| | | 2007 | 2008 | 2009 | 2010 |
| Spawn/Redd | SF Trinity | No Survey | No Survey | 147 redds (147 CH), 453 live CH, 24 live CS) | 252 redds (CH), 1214 live CH (yes…1214) |
| Spawn/Redd | Big French Creek | No Survey | No Survey | 8 redds (CH), 6 live CH | 14 redds (CH), 13 live CH |
| Spawn/Redd | Canyon Creek | 8 Chinook redds | No Survey | 21 redds (CH), 28 live CH, 1 live CS | 16 redds, 19 live CH |
| Spawn/Redd | Sidney Gulch | No survey | No survey | No survey | 11 redds (1 CH, 10 CS), 4 live CH, 4 live CS |
| Snorkel Counts | Canyon Creek | 2 steelhead | 0 fish | STH (3), 1/2 STH (0), CH (0), CH Jacks (0) | STH (7), 1/2 STH (1), CH (7), CH Jacks (1) |
| Snorkel Counts | North Fork. Trinity | 399 summer steelhead | 167 summer steelhead | STH (817), 1/2 STH (10), CH (7), CH Jacks (0) | STH (794), 1/2 STH (26), Ch (8), Ch Jacks (1) |
| Snorkel Counts | New River | 898 steelhead; 50 Chinook | 194 steelhead; 28 Chinook | STH (1036), 1/2 STH (52), CH (39), CH Jacks (47) | STH (853), 1/2 STH (41), CH (165), CH Jacks (48) |

CH = Coho Salmon ; CS = Chinook Salmon ; STH = Steelhead

**Data Location:** Forest Headquarters, Redding, CA.

### *Instream Flows*

**Forest Plan Standard 1:** Develop an instream flow assessment program to determine fish needs and to protect the integrity of fish habitat in selected streams. (Ref: Forest Plan Standards and Guidelines, page 4-18, #9a)

**Methods and Results:** In 2004, an agreement was signed by PG&E to adopt the proposed flows for the Pit 3, 4 and 5 FERC relicensing project supported by the Forest Service through the '4e' process. The agreed-upon flows within the three Pit River bypass reaches (20+ miles in length) increase up to 300% over existing flow levels. Issuance of the license by FERC occurred in July, 2007. The greater flows cannot commence until operational infrastructure changes can be completed which must be done within three years of license issuance (unless a time extension is granted by FERC). Once the new flow regime can commence, a multitude of instream flow monitoring projects, being developed now, are scheduled to be implemented. Preliminary results from them will be documented in future reports.

**Data Location**: Forest Headquarters, Redding, CA.

**Forest Plan Standard 2:** Coordinate instream flow needs with the California Department of Fish and Game (DFG), Counties, and other local agencies to benefit fish habitat. Specific projects may entail hydroelectric facilities, water diversions, and water impoundments. (Ref: Forest Plan Standards and Guidelines, page 4-18, #9b)

**Methods and Results:** The DFG was a representative on the Pit River Collaborative Team and worked cooperatively with the United States Forest Service (USFS) in the development of the Forest Service's 4(e) conditions and 10(a) recommendations. This has been an ongoing collaboration every year since 1999.

The Forest also worked closely with the Department in negotiating an acceptable riparian habitat replacement ratio (1:1 chosen) for the vegetation removed in order to widen the Trinity River near Lewiston on National Forest System Lands. The widening occurred in order to accommodate greater volumes of coarse sediment injected onto 1800 feet of river in 2007 to benefit fish. Another load of gravel may be delivered again in the near future.

**Data Location:** Forest Headquarters, Redding, CA.

### *Improve the Anadromous Fishery*

**Forest Plan Standard 1:** Improve the anadromous fishery within the Trinity River and its tributaries. This can be done by evaluating and implementing opportunities for stream habitat improvement, watershed restoration, and biological (stock) enhancement in the context of a watershed/ecosystem analysis. These projects will be done in conjunction with the Trinity River Basin Fish and Wildlife Management Program. (Ref: Forest Plan Standards and Guidelines, page 4-18, #9c).

**Methods and Results:** South Fork Management Unit fisheries and partner source funds were used to support fish passage in Packer's Creek, Soldier Creek and Barker Creek, and watershed restoration and road decommissioning activities in several tributaries primarily in the South Fork Trinity River. Juvenile coho salmon surveys, adult salmonid surveys, stream condition surveys, and spring/fall Chinook salmon surveys were all conducted within the South Fork Trinity. The fish passage projects as well as the South Fork Trinity surveys spanned both fiscal years.

Coho salmon in the Trinity River system were listed as federally threatened by virtue of the Endangered Species Act (ESA) in 1997, with Critical Habitat designated in 1999. Biological assessments have been written to the National Marine Fisheries Service for their concurrence and/or opinion of every proposed action developed by the Forest in the Trinity River basin since 1997. One of the many actions the Forest does as a consequence of this ESA listing is determining the baseline conditions of coho and related anadromous fish habitats within the Trinity River in order to help determine the overall trend in welfare of the species and provide information for their presumed eventual status recovery. Streams surveyed for this purpose in 2009 and 2012 are listed in Table 7.

**Table 7: Baseline condition surveys completed in FY 2009 and FY 2010.**

| Baseline Year | HUC-7 Code | HUC-7 Name |
|---|---|---|
| 2009 | 18010211080306 | Connor Creek |
| 2009 | 18020153020402 | Hall City Creek |
| 2009 | 18010211110201 | Manzanita |
| 2009 | 18010211110303 | Lower Big French Creek |
| 2009 | 18010212020301 | Plummer Creek |
| 2010 | 18010211110202 | Price Creek |
| 2010 | 18010212030101 | Headwaters Hayfork Creek |
| 2010 | 18010211080303 | Soldier Creek-Trinity River |
| 2010 | 18020153020402 | Wilson Creek |
| 2010 | 18010212040401 | Upper Corral Creek |

**Forest Plan Standard 2:** Coordinate rehabilitation and enhancement projects with cooperating agencies involved in the Trinity River Basin Fish and Wildlife Management Program ( Ref: Forest Plan Standards and Guidelines, page 4-18, #9d).

**Results**: Coordination with the Trinity River Restoration Program (TRRP) was active in FY 2009 and 2010. The Forest Service is a chartered member of the TRRP Management Council and participates in all Council and subcommittee functions. The Forest took the lead on a Trinity River coarse sediment injection project in the Trinity River on Forest Service managed lands immediately below the Lewiston Dam outlet in FY 2006, and then completed in FY 2007. Gravel injection covered 1,800 linear feet of river with about 9,000 tons of rock. Funding for the project originated from the Trinity River Restoration Program. It is anticipated that more rock will be required to be deposited at this site within the next two years.

**Data Location:** Forest Headquarters, Redding, CA.

## Wildlife Management

### *Late-Successional Reserves*

**Forest Plan Standard:** A management assessment should be prepared for each large Late-Successional Reserve (or group of smaller Late-Successional Reserves) before habitat activities are designed and implemented. (Ref: Forest Plan page 4-37)

**Monitoring Objective:** Late-Successional Reserves (LSRs) were developed to protect and enhance conditions of late-successional and old growth forest ecosystems which serve as habitat for late-successional and old growth-related species. LSR Assessments will provide guidelines to meet desired conditions.

**Methods:** A comprehensive forest-wide late-successional reserve assessment (LSRA) was completed in 1999. This LSRA was produced by an interagency core team, including USFWS and the Bureau of Land Management. The LSRA was a significant undertaking, covering 18 LSRs and 6 Managed Late-successional Areas (MLSAs). One additional LSR, Clear Creek, was completed in 1998. All of these assessments used methodology provided by the Regional Ecosystem Office (REO) and the Record of Decision for the Northwest Forest Plan.

**Results:** These assessments have been used extensively in project design and planning. The LSRA stressed the need to treat unacceptable fuel hazards and over stocked stand conditions. The planning for several habitat improvement and fuels reduction projects progressed in FY 2009 and 2010:

**Recommendations:** Continue use of the LSR assessment for project planning and update at periodic intervals.

**Public Involvement:** The public was informed of project progress in the quarterly Schedule of Proposed Actions, which can be found at http://www.fs.fed.us/sopa/forest-level.php?110514 and during NEPA scoping and comment periods.

**Data location:** Forest headquarters, Redding, various Ranger Stations, and the Shasta-Trinity Forest website at http://www.fs.fed.us/r5/shastatrinity/publications/

### *Threatened, Endangered, and Sensitive Species*

**Forest Goals and Standards:** Monitor and protect habitat for federally listed threatened and endangered (T&E) and candidate species. Assist in recovery efforts for T&E species. Cooperate with the State to meet objectives for State-listed species. Manage habitat for sensitive plants and animals to prevent them from becoming a candidate for T&E status.

**Monitoring Objective:** Identify endangered, threatened, and candidate species present or potentially present on the Forest.

**Methods:** Review of Forest and US Fish & Wildlife records documenting species status.

**Results:** There are currently two endangered, six threatened, and two candidate terrestrial species on the Forest (Table 9).

**Recommendations:** Continue to monitor listing status of species.

**Public Involvement:** None.

**Data location:** Forest headquarters, Redding

**Table 8: Description and status of projects planned within late-successional reserves.**

| LSR | Project | Description | Status |
|---|---|---|---|
| Chanchellula | Gemmill Thin project; 1,500 acres in LSR | Thinning and fuels reduction to enhance and protect late successional habitat near Wildwood and Chanchelulla Wilderness. Draft EIS completed in FY10. | Final Gemmill Thin EIS expected in FY 2011 |
| Harris Mountain | Harris Vegetation Mgt. project: 3,000 acres in and adjacent to LSR | Improve forest health and restore fire-adapted ecosystem characteristics. Ground and ladder fuels would be reduced and forested stands would be thinned to yield a fire-resilient forest | Draft EIS expected in FY 2011 |
| Clear Creek | Pettijohn LSR project; 1,155 acres in LSR | Fuel reduction project within LSR designed to reduce fuel loading and maintain/enhance old-growth habitat. Includes commercial thinning from below, roadside FMZ (non-commercial), and road decommissioning. | FEIS Decision expected in FY11 |
| Mudflow | Mudflow Vegetation Mgt. project; approx. 350 acres in LSR | Approximately 3000 acres of commercial thinning, Green Tree Retention and fuels reduction within the urban interface of the town of McCloud and the Mt. Shasta Forest Subdivision, removing encroaching conifers from meadows and application of Borax. | FEIS Decision expected in FY 2011 |
| Algoma | Algoma South, Algoma East and AlgomaWest); 5,300 acres in LSR | Draft EIS in progress FY09 and 10 Thinning/other silvicultural and fuels treatments of forested stands within the Algoma Late Successional Reserve. Application of a borax to cut stumps 14 inches and larger. Some new road construction. | Draft EIS expected in FY 2011 |
| Moosehead | Moosehead Vegetation and Road Management Project EIS | Approximately 2400 acres of thinning and fuels treatments, 21 miles of road Reconstruction and 11 miles of road decommissioning and closures. | NEPA work will continue in FY 2011 |
| Elk | Elk LSR Enhancement Project; 2,200 acres | Reduce tree densities and fuels (with thinning and fuels treatments) within in the Elk Flat Late Successional Reserve to protect current late/mid-successional habitat (and develop future late-successional habitat conditions) | EIS NEPA work will continue in FY 2011 |

**Table 9: Terrestrial threatened and endangered species on the Shasta-Trinity National Forest.**

| Scientific Name | Common Name | Status* |
|---|---|---|
| *Orcuttia tenuis* | slender Orcutt grass | T |
| *Arabis macdonaldiana* | McDonald's rock-cress | E |
| *Branchinecta lynchi* | vernal pool fairy shrimp | T |
| *Desmocerus californicus dimorphus* | valley elderberry longhorn beetle | T |
| *Pacifastacus fortis* | Shasta crayfish | E |
| *Rana aurora draytonii* | California red-legged frog | T |
| *Brachyramphus marmoratus* | marbled murrelet | T |
| *Coccyzus americanus* | western yellow-billed cuckoo | C |
| *Strix occidentalis caurina* | northern spotted owl, Critical habitat | T |
| *Martes pennanti pacifica* | Fisher, West Coast DPS | C |

* Status Codes: (E) Endangered; (T) Threatened; (C) Candidate

## *Neotropical Birds*

**Forest Plan Standard:** Manage habitat for Neotropical migrant birds to maintain viable population levels. (Ref: Forest Plan page 4-29, #25.c)

**Objective:** Survey breeding birds and Neotropical migratory birds. Although this is not a Land & Resource Management Plan requirement, monitoring is part of the national Forest Service "Partners in Flight" program for Neotropical migratory bird management. Additionally, annual Breeding Bird Surveys are conducted to monitor range-wide trends in Neotropical migrant bird populations and distribution.

**Methodology:** In FY 2009 and 2010, two methodologies were used. First, bird population and habitat data were collected at White's Bar bird banding station and at Sims banding station. Mist net captures were from May-August according to the Monitoring Avian Productivity and Survivorship (MAPS) protocol. Partnerships include Partners in Flight, the Institute for Bird Populations, and Forest Service PSW Redwood Sciences Lab.

Secondly, Breeding Bird Surveys (BBS) are a series of point counts along 25-mile road transects, surveying a total area of 130 acres per transect. Breeding Bird Surveys were conducted on 4 routes: one on the Trinity Management Unit, one on the South Fork Management Unit, and two on the Mt Shasta-McCloud Management Unit.

**Results and Recommendations:** MAPS captures were conducted at two locations, ten days per location. Birds were banded from May through August; banding stations utilized 10 nets for 5 hours each banding day. Information was collected for each bird captured. At White's Bar banding station, for example, over 300 birds and 28 species were banded in FY 2010; in FY 2009 over 300 birds and 30 species were banded. Results were integrated into the Breeding Bird Survey analysis program at the US Geological Survey's Patuxent Wildlife Research Center and the MAPS analysis program PSW Redwood Sciences Laboratory and the Institute for Bird Populations. Additionally in FY 2009, we participated in the international avian influenza monitoring and research effort to collect cloacal swab and feather samples. These samples were sent to the Center for Tropical Research at UCLA to further the goal of developing custom vaccines against Influenza A.

The four breeding bird surveys were conducted on 1,000 acres. The 2009 and 2010 BBS trend estimates are available for use in species assemblage analysis.

**Public Involvement:** Partners in Flight, the Institute for Bird Populations

**Data located:** North American BBS web-site, USDA Forest Service NRIS Wildlife database; Forest headquarters, Mt. Shasta Ranger Station and Weaverville Ranger Station, USGS Biological Resources Division, USGS Patuxent Wildlife Research Center, PSW Redwood Sciences Laboratory, and the Institute for Bird Populations.

### *Biological Diversity: snag retention*

**Forest Plan Standard:** Snags are to be retained within the harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels based on published guidelines and models or a minimum average of 1.5 snags per acre greater than 15 inches in diameter and 20 feet in height. Provide specified amounts of coarse woody debris in Matrix management well distributed across the landscape: (1) Provide a renewable supply of large down logs well distributed across the Matrix (2) Coarse woody debris already on the ground should be retained and protected. (Ref: Forest Plan, page 4-61)

**Objective:** Survey and maintain at least minimum management requirements for dead/down, hardwoods, and snags at both pre and post-project levels.

**Methods:** Data collected during visual surveys for snag and dead/down densities at timber sale projects as well as with silvicultural measurements at proposed timber sales.

**Results and Recommendations:** For FY 2009 and 2010, dead/downed wood minimum standards were met in all areas where the baseline level of snags met the minimum standards. Additionally, Mt Shasta and McCloud District policy is to leave any tree or snag deemed a hazard on site as downed wood. Continue monitoring of salvage and green sales for dead standing/down woody material.

**Public Involvement:** Project level NEPA and indirect involvement *vis a vis* informal conservation education events.

**Data location:** Data is in NEPA documents at the Ranger stations.

### *Terrestrial Species Monitoring Examples*

#### Northern Spotted Owl

**Objective:** Monitor northern spotted owl nesting territories to determine breeding status and monitored projects to determine presence as required to complete projects during limited operating period.

**Methods:** During FY 2009 and 2010, 56,320 acres of suitable owl habitat were surveyed on the Trinity River Management Unit. During 2009, 90,880 acres of suitable owl habitat were surveyed on the South Fork Management Unit. During FY 2010, 116,480 acres of suitable owl habitat were surveyed on the SFMU. Owl habitat was evaluated by reviewing vegetation maps, aerial photos and conducting field work. Night and day

surveys were conducted in proposed timber sale areas and fuels projects using the 1993 standardized spotted owl protocol.

During FY 2009, approximately 50,000 acres of suitable northern spotted owl habitat were surveyed on the Shasta-McCloud Management Unit. This included 9 timber sale projects that were surveyed at night. In FY 2010, approximately 40,000 acres of suitable northern spotted owl habitat were surveyed on the SMMU. This included 8 timber sale and at FERC projects that were surveyed at night.

This survey work also included historical northern spotted owl territories and the McCloud Pit FERC re-licensing project. Region 5 spotted owl survey protocol was utilized and historical searches to determine breeding status. Information was coordinated with the State of California and adjacent private landowners.

**Results and Recommendations:** The SMMU found northern spotted pairs at seven sites in FY 2009 with two pairs nesting and at three sites in FY 2010 with two pairs nesting. Recommend continuing monitoring owl territories and projects to assess breeding status.

In 2009, twelve spotted owl pairs were found on the TRMU with nesting confirmed for five pairs. In addition, twelve singles were detected. On the SFMU eleven spotted owl pairs were found with nesting confirmed for six pairs. In addition, twenty four singles were detected.

In 2010, seventeen spotted owl pairs were found on the TRMU with nesting confirmed for six pairs. In addition, seven single spotted owls were detected. On the SFMU, thirteen spotted owl pairs were found with nesting confirmed for four pairs. In addition, ten singles were detected. Recommend continuing monitoring owl territories and projects to assess breeding status.

**Public Involvement:** Indirect involvement *vis a vis* informal conservation education events. Information is shared with California Department of Fish and Game, USDI Fish and Wildlife Service and timber companies.

**Data location:** Hard copies are located at each ranger district office and electronically stored in the USDA Forest Service NRIS Wildlife database.

## Small Owl monitoring

**Objective:** Four owl species - Northern Saw-whet, Flammulated, Western Screech and Northern Pygmy - were monitored to gain information for analysis of small owl population trends. Information will be used to provide baseline information in project-level NEPA and Forest level wildlife analysis.

**Methods:** Methods follow the Owl Capture and Census Protocol designed by the Klamath Bird Observatory and Redwood Sciences Lab. Monitoring sites were selected in the interior of the forest where two mist-nets were placed parallel with a tape player in the middle to audio-lure owls into nets. Owl capture and censusing began at dusk and continued for three hours. In 2009, small owl populations were surveyed in one project area on the South Fork Management Unit. In 2010, small owl surveys were conducted in

one project area on the Trinity River Management Unit and 2 project areas on the South Fork Management Unit.

**Results and Recommendations:** In 2009, the Owl Capture and Census survey resulted in detection of only 1 species of small owl: western screech. In 2010, 2 species of small owls were detected: western screech and flammulated. In addition, Project owl surveys documented locations of the small owl species across a survey area of 147,200 acres in 2009 and 2010, 172,800 acres in and around project areas for use in project-level NEPA and MIS analysis.

**Public Involvement:** Klamath Bird Observatory

**Data location:** Hard copy field forms can be found at the Weaverville Ranger Station at the wildlife department. Data was entered into the USDA Forest Service NRIS Wildlife database.

## Peregrine Falcon monitoring - Trinity Forest

**Objective:** Cooperate with the U.S. Fish & Wildlife Service to implement the Post-delisting monitoring requirement of ESA. Monitor our peregrine falcon territories to contribute to nationwide and state trends. Most of the peregrine falcon eyries (nesting sites) have been monitored for over twenty years and an extensive database has been generated over this time.

**Methods:** Biologists surveyed 7 peregrine territories by following established peregrine falcon protocols. Observation points were established where the observer can see the nesting area without impacting the birds using high powered spotting scopes. The observer watched the nesting area for 1 to 5 hours, depending on weather and activity. Any observations and all activities were recorded for data entry.

**Results and Recommendations:** Of the seven peregrine eyries, four had adult peregrines present with confirmed nesting at three eyries. In addition, peregrine occupancy and reproductive results were forwarded to a national database for distribution. It is important to continue the post-delisting monitoring efforts to track occupancy and reproductive success.

**Public Involvement:** Information was collected in conjunction with Santa Cruz Predatory Bird Research Group and is shared with California Department of Fish and Game and adjacent land owners.

**Data location:** Hard copy field forms can be found at the Weaverville Ranger Station at the wildlife department. Data was entered into the USDA Forest Service NRIS Wildlife database.

## Northern Goshawk

**Objective:** Goshawks are considered a sensitive species on the Shasta-Trinity National Forest. The McCloud Ranger District contains approximately 33 historical nesting territories. The standard is to protect the viability of the species and to assess individual territories on a project basis. Since 1992, 100-acre goshawk territories have been defined to include primary and alternate nest cores. During project preparation, habitat

alteration is delayed or minimized in the 100-acre territories if nesting has occurred in recent years.

Trinity River and South Fork Management Units contain 43 known goshawk territories. Territories are surveyed within project areas for occupancy and reproduction to protect the viability of the species.

**Methods:** Acoustical walking surveys determined recent occupancy and nest success in 30 goshawk territories on McCloud district.

Two methods of surveying were used on the Trinity Forest: stand searches and broadcast acoustical survey. In 2009, two goshawk territories were surveyed and in 2010 Nineteen were visited. When surveying historic Northern goshawk territories habitat assessments were preformed on these locations to update the territory information and determine suitability for reproduction and occupancy.

**Results and Recommendations:** In FY 2009 and FY 2010 on the McCloud district, nest searches were completed each year in 30 territories and approximately 3000 acres. Nine territories were occupied in 2009 and eight territories were found to be occupied in 2010. The validity of the 100-acre core territories will be visited on a project-by-project basis. Recommend to continue monitoring 100-acre nest territories.

On the Trinity Forest, one territory was occupied in 2009 and three were occupied in 2010. Recommend to continue monitoring historical nest territories and new project areas. Identify and map habitat modifications such as fire to known territories.

**Public Involvement:** Information is shared with California Department of Fish and Game and adjacent landowners.

**Data location:** USDA Forest Service NRIS Wildlife database and at each Ranger Station.

### Bald Eagle monitoring

**Objective:** To protect, monitor, manage and enhance the bald eagle population and habitat on Shasta, Lewiston and Trinity Lakes within the NRA.

**Methods:** In FY 2009 and FY 2010, conducted inventory of entire lake and shoreline at Shasta, Lewiston, and Trinity Lakes in support of nationwide annual survey effort of the Mid-Winter Bald Eagle Survey. Nesting season surveys were also conducted to determine nesting territory occupancy, nesting activities and nest productivity as per Pacific State Bald Eagle Recovery Plan direction and California Dept. of Fish and Game protocol.

**Results and Recommendations:** The FY 2009 results of the mid-winter survey for Shasta Lake were 28 adults and 1 immature eagle for a total of 29 eagles. At Trinity Lake there were 26 adults and 6 immature eagles for a total of 32 eagles. At Lewiston Lake there were 5 adults and 3 immature eagles for a total of 8. The total bald eagle count for all three lakes was 69.

During FY 2009, 36 nest territories and 52,000 acres of eagle habitat were monitored at 3 reservoirs in the NRA. Monitoring revealed that 32 territories were occupied. A subset of nests were monitored to determine fledging success, and 15 chicks were fledged

from those nests. Contributing to breeding success was implementation of a Forest Order to close and restrict access to 2 nest territories to protect against visitor impacts.

The FY 2010 results of the mid-winter survey for Shasta Lake were 44, with 41 adults bald and 3 immature bald eagles. At Trinity Lake there were 18 total, with 17 adults and 1 immature bald eagle. At Lewiston Lake there were 7, with 5 adults and 2 immature bald eagles. The total bald eagle count for all three lakes was 69.

During FY 2010, 30 nest territories and 52,000 acres of eagle habitat were monitored at three reservoirs in the NRA. Monitoring revealed that 27 territories were occupied. A subset of nests were monitored to determine fledging success, and 16 chicks were fledged from those nests. Contributing to breeding success was implementation of a Forest Order to close and restrict access to 2 nest territories to protect against visitor impacts.

Recommend continuing to conduct annual mid-winter bald eagle survey. Continue monitoring during nesting season to determine active and inactive eagle territories. Monitor a subset of the active territories to determine nesting/fledging success.

**Public Involvement:** None

**Data location:** Shasta Lake Ranger Station.

### Green Mountain Prescribed Burning Project

**Objective:** The objectives of this habitat improvement project are to use prescribed fire and mechanical treatment as a tool:

1. To increase the quality and quantity of forage and increase habitat effectiveness for Rocky Mountain elk and other resident wildlife in the vicinity of the Squaw Creek/Pit watershed;
2. Protect bald eagle nest trees and territories;
3. Improve forest health; and
4. Reduce the risk of catastrophic wildfire.

**Methods:** Fire was applied by hand firing methods. Pre- and post-burn monitoring was conducted to determine relative success of meeting resource objectives. Photo-points are established to monitor growth of vegetation over time.

**Results and Recommendations:** During FY2010 a total of 1,100 acres were burned in planned ignitions while in FY 2009 600 acres were prescribed burned. Two bald eagle nest stands were under-burned at a low intensity, reducing surface fuel loading. Objectives for the project were met. Recommend continuing treatments at Green Mountain to restore and maintain wildlife habitat and reduce fuel loading.

**Public Involvement:** Partnered with Rocky Mountain Elk Foundation (RMEF) to fund the project. RMEF contributed $40,000 toward completion of the project.

**Data location:** Shasta Lake Ranger Station.

## Peregrine Falcon monitoring - Shasta Forest

**Objective:** Monitor historical sites to conform nesting or occupancy.

**Methods:** Used Region 5 peregrine protocol as a guide for monitoring individual, known peregrine habitat. Several visits were made to each site.

**Results and Recommendations:** In FY 2009 and FY2010 monitoring occurred at the Sacramento River site and Castle Crags site. In both years, biologists confirmed two young fledged at the Sacramento River site, though it is unknown how many fledged at the Castle Crags site. Recommend to continue yearly monitoring.

**Public Involvement:** Information is shared with California Department of Fish and Game and adjacent land owners.

**Data location:** USDA Forest Service NRIS Wildlife database; Mt. Shasta Ranger and McCloud Ranger Stations.

## Night Jar Monitoring – Trinity Forest

**Objective:** Determine population distribution and trends of Nightjar species across the United States, including in project areas.

**Methods:** Nightjar presence was surveyed and recorded along established survey road routes. The protocol created by the Center for Conservation Biology at the College of William and Mary and Virginia Commonwealth University was used. During 2010, four routes were surveyed one time each from June 9-July 4. Each route consisted of stopping at 10 points for 6 minutes each. At each point all nightjars seen or heard were recorded. Wind, noise, cloud cover, and moon visibility were also recorded.

**Results and Recommendations:** In 2010, nightjars were observed during two routes. One route detected 3 common poorwills and one route detected 2 common nighthawks.

**Public Involvement:** This survey effort was coordinated by the Center for Conservation Biology at the College of William and Mary and Virginia Commonwealth University. Surveys are conducted by volunteers throughout the nation in an effort to monitor Nightjar populations and trends.

**Data location:** Hard copy field forms can be found at the Weaverville Ranger Station at the wildlife department. Data was entered into the USDA Forest Service NRIS Wildlife database.

## Fisher monitoring

**Objective:** Monitor fisher population by documenting presence of fisher, a Forest Sensitive species and Federal Candidate, on Forest lands to model habitat use and assess current distribution, including in project areas.

**Methods:** Fisher presence was monitored using remote sensor camera stations set up in project areas. Stations were placed in areas with the most suitable fisher habitat. Each station was baited with chicken and gusto scent and was set up until either a fisher was detected or 28 days passed. Survey methods described in the 1995 protocol by Zielinski

and Kucera were used. In 2009 on the Trinity Forest, one project area was surveyed on the Trinity River Management Unit using 9 camera stations. In 2010 on the Trinity Forest, one project area was surveyed on the South Fork Management Unit using 4 camera stations. On the Shasta Forest, of 16 camera stations were established across the Upper Sacramento watershed in FY 2010. The surveys were conducted for a total of 42 days during January-March 2010. Field work was conducted by under contract with North State Resources, Inc.

**Results and Recommendations:** On the Trinity Forest in 2009, fishers were detected at 5 stations. Then in 2010, fishers were detected at 2 stations. On the Shasta Forest in FY 2010, fishers were detected at all 16 of 16 camera stations throughout the Upper Sacramento watershed located west of the City of Mt. Shasta. Location sites will be added to a database of fisher distribution on the Forest, sites will be used in project-level NEPA and Management Indicator Species analysis, and sites will be used as part of a larger study to model habitat selection of fishers in northwest California.

**Public Involvement:** Information is shared with adjacent land owners, California Department of Fish and Game, USDI Fish and Wildlife Service, and timber companies.

**Data location:** Forest Service NRIS Wildlife database, Mt. Shasta and Weaverville Ranger Stations.

### Bat monitoring – Shasta Forest

**Objective:** Monitor bat populations at the Trout Creek campground and restoration site. Bat monitoring began in 2005 prior to restoration activities and has continued through 2010.

**Methods:** Mist nest capture techniques and acoustic monitoring were conducted for bats at three Trout Creek locations in 2009 and 2010. The monitoring techniques followed the Western Bat Working Group guidelines. The sites were monitored for two nights per month from June – September in 2009 and 2010.

**Data Collected:** Biological characteristics such as species, sex, and body measurements were collected on each individual captured. Bat calls were recorded upon release for a number of individuals.

**Results and Recommendations:** In FY 2009 and FY 2010 over 300 individuals and 13 species including two Forest Service sensitive species were captured. A final report for the six year monitoring effort is in progress.

**Public Involvement:** A variety of volunteers including bat researchers from Humboldt and Oregon State Universities, USDA Forest Service Redwood Sciences Laboratory and the California Department of Transportation assisted with the monitoring.

**Data location:** Forest Service NRIS Wildlife database, Mt. Shasta Ranger Station, California Department of Fish and Game

### Survey and Manage Monitoring - Trinity Forest

**Objective:** Survey for two Survey and Manage terrestrial mollusk species to determine presence within timber sale and fuels projects.

**Methods:** Identified suitable habitat for one mollusk species on 4,500 acres. Completed Mollusk surveys for two species on approximately 1,000 acres following the 2003 survey protocol for survey and manage terrestrial mollusk species.

**Results and Recommendations:** Of the 1,000 acres surveyed, one *Vespericola pressleyi* site was located. Continue to survey and protect known sites.

**Public Involvement:** Information is shared with the California Department of Fish and Game.

**Data location:** Hard copy field forms can be found at the Weaverville Ranger Station at the wildlife department. Data was entered into the USDA Forest Service NRIS Wildlife database.

## Botany

### *Sensitive Plants*

**Forest Plan Standard:** Analyze, mitigate, and monitor project impacts to sensitive plants. (Ref: Forest Plan pages 4-14 and 4-16, #4a, b, c, Sensitive and Endemic Plants).

**Monitoring Objective:** To ensure that the Forest sensitive plant program effectively maintains the viability of sensitive and endemic plants on the Forest at the project level.

**Method:** Biological evaluations based on preliminary potential habitat evaluation using existing soils and TES plant data; and field surveys of potential habitat in the areas to be affected by project implementation. Mitigation measures are developed by interdisciplinary teams and made part of project designs. Monitoring site visits are taken 1-2 years after project implementation. GIS botany spatial and tabular data are updated periodically as needed.

**Data Collected:** Population numbers, size, location, and habitat; potential project impacts and proposed mitigations. For monitoring, whether mitigations were implemented as prescribed, and whether populations recovered or persisted as predicted by Biological Evaluations.

**Results:** Thirteen new populations of sensitive plants, lichens and fungi were found and documented in FY 2009; including a population of pumice moonwort (*Botrychium pumicola*) was rediscovered on Mt. Shasta that had not been seen since 1940. Approximately 20 populations were identified and documented in FY 2010—complete datasets from contractor and enterprise team field surveys in 2010 have not been received by the Forest, so a final tally is not yet available for 2010. Field surveys were performed for all large projects. A few small or dispersed projects likely to have no effect on sensitive plants because of lack of suitable habitat or lack of expected impacts were analyzed with existing data. Plant Biological Evaluations were written for 17 and 42 projects forest-wide in 2009 and 2010 respectively. No sensitive plants on the Forest were proposed for listing by USFWS. Project design features were developed when necessary to reduce or eliminate impacts to sensitive species; these design features were implemented as planned.

**Recommendations:** Continue field surveys and post-project monitoring at project level.

**Public Involvement:** Through the NEPA process. Also organizations including the California Native Plant Society and the California Department of Fish and Game are involved in reviewing status of sensitive species list.

**Data location:** Project NEPA files, Headquarters & Ranger District botany files, NRIS TESP database (housed at Electronic Data Center in Kansas City), Wildlife, Fish and Rare Plant Management System, and the California Natural Diversity Database (Department of Fish and Game).

### *Conservation Strategies*

**Forest Plan Standard:** Develop at least one conservation strategy per year. (Ref: Forest Plan page 4-16, #4f)

**Monitoring Objective:** To review compliance with our Forest standards, and effectiveness of our collaboration with other agencies in conserving sensitive plants.

**Method:** Office review of sensitive plant files.

**Data Collected:** Number and names of conservation strategies developed or signed in FY 2009 and FY 20010.

**Results:** 2009 focus was on monitoring wetland species of the Shasta-McCloud Management Unit, specifically long-bearded star-tulip (*Calochortus longebarbatus* var. *longebarbatus*) and Columbia cress (*Rorippa columbiae*), both of which have existing Conservation Strategies in need of updating. In 2010, analyses of within-population and among-population genetic diversity were performed by the National Forest Genetics Lab for Shasta snow-wreath (*Neviusia cliftonii*) and an unnamed huckleberry species (*Vaccinium* sp.) that would be affected by inundation if Shasta Dam were raised, as is being proposed by the USDI Bureau of Reclamation.

**Recommendations:** Focus on species at most risk from climate change and those disproportionately affected by land management activities.

**Public Involvement:** No public involvement.

**Data location:** Botany departments at Forest headquarters and Ranger Districts.

### *Noxious Weeds*

#### Collaboration in Weed Management Areas (WMAs)

Northern Province Noxious and Invasive Weeds Program Strategy Objective/Action Item: 2A. Northern Province Forests will actively participate with other agencies and interested parties in county WMAs.

**Monitoring Objective:** To review compliance with Northern Province Weed Program Strategy, and effectiveness of our collaboration with other stakeholders in managing invasive plants.

**Method:** Phone conversations with district noxious weed coordinators; review of files at the Forest headquarters.

**Data Collected:** Weed Management Area memoranda of understanding (MOUs) for Siskiyou, Shasta, and Trinity counties were signed by the Forest Supervisor; attendance by Forest Service representatives at WMA meetings and other events; informal contacts with WMA participants; inventory, prevention, and treatment projects with partners.

**Results:** MOUs for Shasta, Siskiyou, and Trinity WMAs were still in effect in FY 2009 and FY 2010. Shasta-Trinity weed program coordinators cooperated with agencies and non-government organizations in Siskiyou, Shasta, and Trinity WMAs to develop and implement weed projects.

**Recommendations:** Continue regular involvement with Siskiyou, Shasta, and Trinity WMAs and their constituent organizations.

**Public Involvement:** WMAs include federal, state, county, and local agency representatives, non-profit groups, and private stakeholders.

**Data location:** Weed Management Area WMA MOUs are on file at County Agriculture offices, the botany department at Forest headquarters, and Ranger Districts.

Databases:

Northern Province Noxious and Invasive Weeds Program Strategy Objective/Action Item: 1B. Develop and implement automated databases for the storage and retrieval of information on noxious weeds. Ensure that the forests implement Forest Service inventory and monitoring protocols and that data is gathered and shared consistently across units and forests.

**Monitoring Objective:** To review compliance with corporate inventory & monitoring procedures, and use of corporate databases for invasive plants.

**Method:** Review of NRIS INPA (invasive plant) and FACTS database records housed at Electronic Data Center in Kansas City.

**Data Collected:** Proportion of existing invasive plant records in corporate GIS layers and entered into NRIS Invasives database.

**Results:** Weed inventory data entry into NRIS for both 2009 and 2010 is complete. Weed treatment and efficacy monitoring data for 2009 and 2010 are complete in the FACTS database.

**Recommendations:** Continue entering invasive plant inventory data into NRIS INPA. Continue entering invasive plant treatment data into FACTS.

**Public Involvement:** None

**Data location:** Electronic data on national database servers; hard copy data in Botany departments at Ranger Districts and Forest headquarters.

# PHYSICAL ENVIRONMENT

## Soil

**Forest Plan Standards:** Implement forest soil quality standards as they relate to soil productivity and soil erosion. (Ref: Forest Plan 4-25e).

### *Soils Monitoring for FY2009*

**Objectives:** Past erosional data for the Chappie-Shasta OHV Park was lacking for accurate assessment of erosion from OHV use. Because erosion data was missing for accurate assessments for normal use and event use, monitoring sites were established on the two main soil types, Holland and Goulding series. Monitoring was established on types of routes (roads, OHV, and trails), difficulty (easy, moderate, difficult), and use level (light, moderate, high). On June 21st, 2008 the Motion Fire part of the larger SHU-Lighting Complex of fires burned over the Chappie-Shasta OHV Park. Soil burn severity was pronounced in areas of conifer and manzanita on south and west-facing slopes. Many of these areas were around the Chappie-Shasta OHV staging area which burned many critical hub trails that access the rest of the park. It was expected with burned trails and hill slopes, trail erosion will be magnified due to lack of cover and live vegetation to remove excess hill slope water on to these trails thus increasing erosion over unburned sites.

**Methods:** Background erosion and disturbance erosion on Holland and Goulding soils was collected using pre-fire soil collection troughs. Soil erosion was measured for a period of 2 years that developed preliminary OHV Chappie-Shasta erosion database estimating OHV erosional trends. Seven pre-monitoring soil troughs were placed near the Chappie-Shasta OHV staging area on routes OHV19, OHV19a, OHV17, OHV1, OHV76, OHV2, and OHV6. Erosion was monitored from late winter 2006 to late winter of 2008. On June 2008 several pre-fire erosion monitoring sites were burned over by the Motion Fire providing an opportunity to measure the effects of fire on OHV routes. Additionally OHV19, OHV17, OHV19a routes were reworked with additional rolling dips for erosion control. On October 2008, a portion of the OHV Park was heli-mulched with weed-free rice straw at a rate of 1.5 tons/acre to curb excess erosion around the Chappie-Shasta OHV staging area. Post fire monitoring troughs were relocated on past monitoring trails that were burned over and mulched (OHV19); trails that were burned over without mulch (OHV17 upper and OHV19a); trails that were burned over with only hill slopes mulched (OHV17 lower); and natural hill slopes mulched and un-mulched (natural and gully).

**Results:** Pre-fire results showed areas adjacent to the Chappie-Shasta OHV staging area had the most use and had the highest erosion rates (Table 10). OHV19 had the highest erosion rates due to its proximity to the main staging area and being a high use trail. OHV17 and 19 were also event trails so they had additional erosion due to large (500+ riders) hare-scramble events every year.

**Table 10: Pre-fire erosion rates for five OHV routes (Feb. 2006 - Mar. 2008)**

| Route | Soil Type | Type/Level/Use | Size ($ft^2$) | Erosion Rate (t/a/y) |
|---|---|---|---|---|
| OHV19a | Goulding coarse-seds | OHV/Diff/Low | 1573 | 2.2 |
| OHV19 | Goulding coarse-seds | OHV/Mod/High | 807 | 10.0 |
| OHV17U | Goulding coarse-seds | OHV/Mod/High | 1290 | 5.0 |
| OHV1 | Goulding coarse-seds | Road/Easy/High | 6458 | 2.0 |
| OHV76 | Holland fine-seds | Trail/Mod/Mod | 357 | 5.0 |

Post-fire results (Table 11 below) showed mulching had the biggest effect on reduction of erosion with complete trail and hill slope mulching being the most effective. Trail improvements, including rolling dips, reduced erosion significantly due to decreasing slope lengths but was not as effective as full mulching. With mechanical trail work and hill slope mulching only, erosion was still very high due to bare fine-textured soils. When the OHV Park was re-opened in late April 2009, erosion levels jumped up significantly especially main trails close to the staging areas.

**Table 11: Post-fire erosion rates for six OHV sites (Oct. 2008 - June 2009)**

| Route | Soil Type | Type/Level/Use | Treatment | Size ($ft^2$) | Erosion Rate (t/a/y) |
|---|---|---|---|---|---|
| OHV19a | Goulding coarse-seds | OHV/Diff/Low | SWECO / Unmulched | 950 | 0.7 |
| OHV19 | Goulding coarse-seds | OHV/Mod/High | SWECO / Mulched | 1855 | 0.5 |
| OHV17L | Holland fine-seds | OHV/Mod/High | SWECO / Hillslope Mulched | 775 | 12.4 |
| OHV17U | Goulding coarse-seds | OHV/Mod/High | SWECO / Unmulched | 1628 | 5.5 |
| Natural | Goulding coarse-seds | Burned Hillside | Mulched | 873 | 0.02 |
| Gully | Goulding coarse-seds | Burned Gulch | Mulched | 26136 | 0.07 |

**Recommendation:** Data shows trail work, by a SWECO trail dozer, and full mulching on OHV19 (high use trail) reduced erosion from 10.0 to 0.5 tons/acre/year. With only SWECO trail improvements, erosion was reduced on low use trails (OHV19a, 2.2 to 0.7 t/a/y) but had marginal effects on high use trails (OHV17, 5.0 to 5.5 t/a/y). After fire pre-mulch erosion rates were very high on OHV19 and OHV17 trails (3.3 to 4.5 t/a/3mts) vs. mulched erosion rates which remained low for OHV19 (0.05 to 0.36 t/a/3mts) and moderate to high for OHV17 (0.84 to 2.58 t/a/3mts). Background erosion levels for treated hill slopes (natural and gully sites) showed extremely low erosion rates (0.02 to 0.07 t/a/y). When the OHV park re-opened in April 2009 erosion rates for OHV19 was 0.50 t/a/3mts vs. OHV17 was 4.3 t/a/3mts showing mulch was still very effective in curbing erosion on high use trails.

On the upper part of OHV17 where there was only SWECO trail improvements, erosion rates after the park opened were 3.3 t/a/3mts showing SWECO treatments as partially effective. This is not to say rolling-dips are not effective in reducing massive erosion (removing excess water and sediments off the trail) but inter-treatment erosion still remained high. If side outlets on rolling-dips are not maintained on an annual basis then the trail will become bermed and dips will become ineffective. Over time the trail will become trenched requiring SWECO trail treatments to reestablish rolling-dips and removing outside berms.

Conclusion of monitoring was full mulch treatments across trails and hill slopes effectively curbs most erosion and combined with seasonal closure allows trails and hill slopes to stabilize and naturally seed in. This treatment is most effective after SWECO trail work allowing newly formed rolling-dips to settle and re-vegetative without eroding before opening in late spring for OHV use.

**Public Involvement:** Occurs during the NEPA process for identified projects.

**Data Location:** Soils department at Forest headquarters, Redding, CA.

### *Soils Monitoring for FY2010*

**Objectives:** This report documents the Lakehead Mastication Project treatment effectiveness part of the larger Lakehead Fuels Reduction Project near Shasta Lake. Track excavators with slash buster masticator heads conducted mastication operations in later January and February 2009 when soils were wet to very wet. Concerns were expressed that soils were too wet for mastication and detrimental soil displacement and compaction would occur. Soils were fine-textured clay loams that have high compaction hazard ratings. Monitoring consisted of measuring soil moisture, disturbance, and compaction levels on flat, sloping, and steep slopes. Results showed low-pressure masticators can operate on wet soils without causing excessive displacement or compaction on slopes less than 35%.

**Methods:** On 1/16/2009 and 2/9/2009 two PC160 Komatsu track excavators with slash buster masticator heads conducted two mastication operations of removing Manzanita brush fields and thinning small diameter conifers on about 200 acres. Operations finished on 2/20/09 leaving a cleared understory of conifer and oak. Operations on 1/16/09 were initially conducted on clear warm winter days with light recent rainfall events; where operations on 2/9/2009 were just after significant rainfall events and soils were very moist. Komatsu PC160 excavators used for mastication were small light weight, low ground pressure excavators. With ground pressure ratings of 5.69 psi the PC160 can operate on sensitive soils with minimal ground disturbance.

Shasta-Trinity Forest Soil Scientist sampled soils throughout the Lakehead mastication project area to evaluate the effects of compaction on Holland clay loam with a severe compaction rating. Thirty soil cores were sampled across the project areas in the 4 to 8 inch zone (depth of conifer feeder roots) where mechanical harvesting compaction is most expressed. Samples collected focused on undisturbed control sites vs. disturbed tracked sites on flat (0-5% slopes), sloping (5-15% slopes), steep areas (15-45% slopes) located on N, E, and S-facing slopes (Figure 2).

**Results:** Average disturbance is shown in Table 12 below where 35% of the area was disturbed (tracks with displacement) and 65% was undisturbed. The Shasta-Trinity National Forest Land Management Plan has regional soil quality standards that need to be followed for all land management activities. Soil Quality Standards state 1) that in an even-aged managed stand no more than 15% of the area shall be in a nonproductive state (landings, roads, and main skid-trails), 2) Bulk density shall not exceed threshold values rendering the soil to a nonproductive state (similar to landings or roads), 3) Soil porosity (voids for water and gas exchange) shall not decrease by 10% over background levels. Bulk density (measured as g/cc) shows increases especially for steep areas as soil moisture increased. Porosity (voids in the soil matrix) show maximum decreases on steep areas especially as moisture increased. Calculating threshold bulk density for undisturbed sites shows disturbed sites on flatter ground (track) did not exceed the calculated threshold of 1.49 g/cc. Maximum value obtained was 1.41 g/cc for these disturbed sites. For the steep disturbed sites they did exceed bulk density threshold of 1.27 g/cc with an average value of 1.42 g/cc.

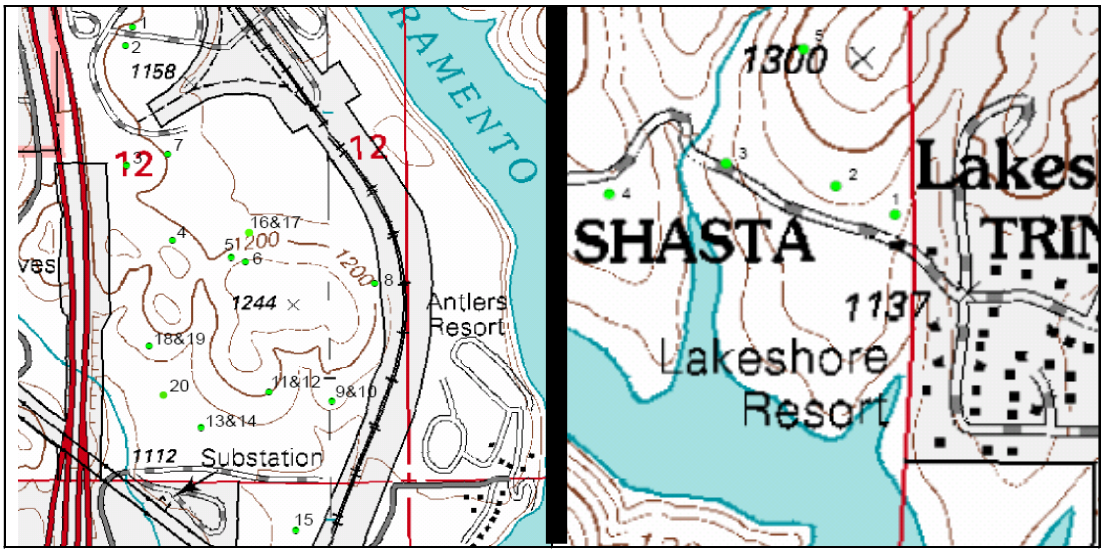


**Figure 2: Lakehead mastication soil moisture monitoring locations (green circles) for project area 1 (left) and 2 (right).**

**Table 12: Average disturbance for the Lakehead mastication project areas 1 and 2.**

| Project Area* | Disturbance | Samples | Area % | Bulk Density (g/cc) | Porosity Decrease |
|---|---|---|---|---|---|
| 1 | Undisturbed | 5 | 45 | 1.35 | 0 |
| | Steep Undisturbed | 4 | 20 | 1.17 | 0 |
| | Track | 5 | 25 | 1.42 | 5.6 |
| | Steep Track | 6 | 10 | 1.38 | 16.1 |
| 2 | Undisturbed | 3 | 50 | 1.23 | 0 |
| | Steep Undisturbed | 2 | 20 | 1.16 | 0 |
| | Track | 3 | 20 | 1.35 | 9.7 |
| | Steep Track | 2 | 10 | 1.45 | 22.2 |

*Project Area 1: South aspect had 23% soil moisture ; North aspect had 25% soil moisture
Project Area 2: South aspect had 29% soil moisture ; North aspect had 32% soil moisture

Soil porosity decreased 5.6% (with soil moisture at 23%) up to 9.7 % (with soil moisture at 29%) on the flatter disturbed sites and 16.1% (dryer) to 22.2% (wetter) on the steep disturbed sites (Table 12). Soil porosity did not decrease by 10% on the majority of the project (5.6% to 9.7% decrease) with 90% of the area either undisturbed or only moderately disturbed, below threshold limits. Only 10% of the project area (steep areas over 35% slopes) exceeded compaction threshold limits, well below the 15% area extent threshold requirement of the Shasta-Trinity Forest Plan.

**Recommendation:** These values show soils are too moist for conventional mechanical timber harvesters (where soil moistures need to be less than 20%), but for small track mounted masticators (with ground pressure less than 6psi) moist soils can be operated on in the winter. In this case Holland clay loam soil has one of the highest compaction risks, making the Lakehead Mastication Project an ideal area for evaluating low pressure masticators. Lakehead area has high rainfall amounts and warm winters so strong clay soils develop on flatter slopes.

By extrapolating this data to other fine-textured soils with similar rainfall, and vegetation (low elevation mixed conifer with brush transition zones) this data shows if low pressure masticators operate on soils with moisture levels less than 30% and on slopes less than 35% over a bed of masticated material detrimental compaction can be avoided or minimized during winter months. But when masticators operate on ground with slopes over 35% in the winter, excessive compaction and displacement occurs. This is due to more force being exerted on the downhill portion of the excavator tracks thus uneven weight distribution caused by steep slopes. In contrast on flatter terrain weight distribution is more evenly distributed across the tracks.

**Public Involvement:** Occurs during the NEPA process for identified projects.

**Data Location:** Soils department at Forest headquarters, Redding, CA.

## Minerals

**Forest Plan Standard:** Minimize adverse impacts of mineral-related activities on surface resources through required lease stipulations and the administration of plans of operations (Ref: Forest Plan, page 4-21c). Field inspections should be conducted quarterly during the operating period (Ref: Forest Plan, page 5-10). Further evaluation and corrective action should be taken if there is non-compliance with an operating plan.

**Monitoring Objective:** One of the main objectives of our minerals program is to process Plans of Operations and Notices of Intent which have been submitted by claimants for locatable minerals sites. We ensure that these plans are reasonable, that they comply with environmental analysis, and that a proper reclamation plan and bond amount has been established. Sites are inspected in the field during the operating period to document compliance with approved plans. Plans that are not in compliance are issued a Notice of Non-Compliance and action is taken bring the operation back into compliance. Law Enforcement can become involved with some of the more persistent non-compliance issues.

Mineral material permits are issued for the free-use or negotiated sale of non-locatable minerals such as sand and gravel, crushed stone, and landscape rock. These permits are issued to the public as well as government roads agencies such as CalTrans. Mineral material sites are also inspected for proper use and will eventually be reclaimed.

Another objective of the minerals program on this forest is to monitor and reclaim mining claims which have been abandoned from years long past. This reclamation includes, but is not limited to; road closure, water quality, structure removal, planting of native vegetation, garbage removal, and the closure of open mine adits and shafts.

**Methods/Data Collected:** Extensive files are kept and constantly updated for each of our Plans of Operation. These files include all correspondence to and from claimants, written inspections, environmental documentation, and anything else associated with their plan. The goals, time lines, and compliance with best management practices included in each plan are monitored during inspections. If there is a concern with a timeline which may not be met or any non-compliance with the plan there is communication with the claimant.

Mineral material permits are issued and recorded for both private and public parties. Mineral material sites are inspected on a regular basis to ensure compliance with requirements set forth in Mineral Materials Permits.

Reclamation projects involve the Mineral Administrator in cooperation with other specialists, and often past and present claim holders to ensure that a project site has been adequately reclaimed.

**Results:** During the 2009 fiscal year the minerals program completed one Plan of Operations requiring NEPA analysis. This plan was inspected and met with requirements set forth in the plan. There were around 30 Notices of Intent submitted for small prospecting operations. Out of the inspections that were performed on Notice of Intent operations there was one Notice of Non-Compliance issued for occupancy and sanitation issues. This operator was bought back into compliance with the help of Law Enforcement.

Permits were issued for the disposal of 62,308 yards of Mineral Materials via free-use permits. 62,300 yards went to government roads projects and 8 yards were issued to private parties.

On to reclamation; in 2009 the Abandoned Mine Lands enterprise team assisted with reclamation of two mine sites. On these sites we were able to close eight abandoned mine adits. Three were filled with dirt and debris while 5 were closed with bat friendly gates. Ten hazardous structures were demolished and removed.

During the 2010 fiscal year two Plans of Operation requiring NEPA analysis were completed. These plans have been inspected and are in compliance to date. Nearly 30 Notices of Intent were submitted for small prospecting operations and all of the inspections found these operations to be in compliance.

Mineral Materials permits were issued for the disposal of a total of 392 tons of material. 42 tons of this material was disposed to the public via free-use permit. 350 tons was sold to a private party via negotiated sale.

In 2010 five abandoned mine adits were closed with bat friendly gates.

**Recommendations:** Continue quarterly monitoring of operating plans and documentation of findings.

**Public involvement:** Plans of Operation and Notices of Intent are submitted by the public. The processing of these plans allows the public to extract minerals from public lands, as allowed in the 1872 mining act, while establishing best management practices to ensure environmental protection. Public scoping is performed for each Plans of Operation that is processed. Public comments are taken into consideration during the NEPA process and before plans are approved.

**Data location:** Shasta-Trinity National Forest: Weaverville, Big Bar, and Hayfork Ranger districts.

## Lands

**Forest Plan Standard:** Implement the land ownership adjustment program through all available procedures such as exchange, donation, and purchase while maintaining resource balance (Ref: Forest Plan Standards and Guidelines, page 4-19, f)

**Monitoring Objective:** Determine net change in acres for each land exchange.

**Methods:** Review program files and summarize findings.

**Results:** There was one land exchange completed during the reporting period. The Hagen-French Ranch land exchange resulted in a net gain of 35.97 acres. This included 140 acres of National Forest System exchanged to a private party in Sections 1 and 2 of Township 33 north, Range 10 west, Mount Diablo Meridian. Non- federal lands exchanged to the Shasta-Trinity included:

- 110 acres in Section 25, Township 2 north, Range 6 east, Humboldt Meridian
- 65.97 acres in Section 11, Township 2 north, Range 6 east, Humboldt Meridian

Most of the 140 acre federal parcel burned at high severity during the 2001 Oregon fire and is currently in an early seral non-forested condition. Analysis documented in the Environmental Assessment for the project indicated that the exchange would increase the amount of hardwood and late-seral habitats for old-growth dependent species.

**Recommendations:** Continue program.

**Public involvement:** Project was in the Schedule of Proposed Actions. During NEPA scoping, letters sent to interested parties, notice published in two newspapers (Shasta and Trinity counties) a total of 6 times – once for NEPA scoping, once for notice of Decision, and 4 times for required Notice of Exchange Proposal; NEPA documents including specialists reports are posted on the Forest's website.

**Data location:** Forest Lands program files 5430 – Headquarters Office.

# Best Management Practices

**Forest Plan Standard:** Implementation of Best Management Practices for protection or improvement of water quality. (Ref: Forest Plan 4-18 c.)

**Monitoring Objectives:** Determine if BMPs were implemented as prescribed in the BMP handbook. Determine if BMPs were successfully implemented at selected sites where BMPs had been prescribed. Determine if the BMPs as implemented were effective for their intended purpose.

**Methods and Data Collected:** Evaluation procedures vary greatly based upon the management activity evaluated, but the overall evaluation process is similar. The type and number of management activities evaluated each year on the Forest are assigned by the Regional Office. The specific management activity sites evaluated are randomly selected from project pools. The criteria for sample pool development have been standardized by the Region for each activity type and are described in the BMP User's Guide (2002).

All BMP evaluations were carried out by unit hydrologists and/or hydrologic technicians. Whenever possible, evaluators were accompanied by unit personnel responsible for implementing the BMP (i.e. range conservationist, contracting officer, etc.). Follow-up office reviews of each BMP occurred with the evaluator and appropriate department representative in those cases when a representative could not accompany the evaluators to the field.

**Results:** The Forest monitored 61 randomly selected sites in FY 2009 and 68 sites in FY 2010 for BMP implementation and effectiveness (Table 13). This fell short of the regional assignment of 63 sites each year for 2009 however in 2010 exceeded the target with 5 additional evaluations. Implementation is considered to be successful when measures planned were implemented, as well as where slight modifications or improvement to what is originally planned occurs as site specific conditions warrant. Some measures are considered at risk if implementation is different from what is typically prescribed.

Effectiveness monitoring assesses how successful each protection measure met its objective to protect water quality. A failure in effectiveness means that sediment likely entered a stream. In some cases the degree and extent of failure is slight and to better understand the implications of failed BMPs, one needs to look closer at the details of the monitoring results. At risk effectiveness ratings are indicative of a partial effectiveness that does not result in direct impacts to stream courses or water quality. Activities monitored in 2009 and 2010 are shown in Tables 13 and 14 respectively.

During FY 2009 and FY 2010 the activities on the forest met water quality and land management objectives through the implementation of BMPs. BMPs were fully implemented at 93% of the monitored sites and effective at 82% of the sites in FY 2009. In FY 2010 the implementation rate was 88% with 82% effectiveness. Wet weather road protection, stream crossings, grazing, and landings had less than 50% implementation in

FY 2009. Landings, stream crossings, road drainage, road decommissioning, prescribed fire, and developed recreation had less than 50% implementation in FY 2010. Stream crossings had less than 50% implementation for three years in a row. Several timber harvest related BMPs had 100% implementation and 100% effectiveness in both FY 2009 and FY 2010.

Most of the BMP deficiencies occur at engineering activity sites. The Forest ecosystem management and engineering staffs are actively working to resolve these problems by increasing coordination and involving earth scientists more frequently to review and develop contract provisions and designs as well as involvement in site inspections. Additionally, the Forest is working to involve more disciplines in the BMP process through additional training and interdisciplinary field evaluation of activities.

Implementation can improve by giving greater emphasis in planning documents and by ensuring that implementers understand the issues and their solutions. Implementation changes with workforce, as well as changes in budget or priorities communicated to implementers. Improving communications between resource specialists and program managers can help insure that those implementing the projects are prepared to meet planning objectives, and are given the training and tools to better protect water quality.

**Recommendations:** The 2009 monitoring indicated that the lowest effectiveness scores that need to be addressed are 1) road surface drainage and slope protection, 2) rip rap composition, 3) sidecasting and 4) decommissioning. The 2010 monitoring indicated that again sidecasting was an issue however this year a new suite of BMP practices had poor effectiveness ratings; these include in-channel construction, wet weather road protection and grazing. Where appropriate, site specific recommendations were made to address perceived issues and improve overall effectiveness. Programmatic recommendations aimed to improve water quality protection overall include the following:

- Continue to increase preventative road maintenance (storm proofing) to reduce impacts that would otherwise result if stream crossing failures or debris flows occur.
- Continue increasing miles of decommissioned routes and utilize past monitoring to modify and better arrest erosion at decommissioning sites.
- Insure that rolling dips are utilized frequently to improve road drainage, break up surface flow slope distances, lower maintenance needs and decrease rutting, rilling and gully erosion.
- There is a need to continue sediment source inventories, field checking and updating maintenance or other improvements needed as well as updating road status and improvements in Infra (the USFS Forest Road management database).
- Continue working to increase involvement with Water Quality Control Boards. Invite water board staffs to participate in a variety of BMP evaluations each year.
- Future BMP evaluations need staff area involvement from the disciplines that are implementing the BMPs onsite during the evaluation.

**Table 13: BMP monitoring results for FY 2009.**

| Best Management Practice Monitored | BMPEP Evaluations | [1]2009 Implemented | | Effective | | Total Sites |
|---|---|---|---|---|---|---|
| | | Yes | No | Yes | No | |
| Streamside Management | T01 | 100% | 0% | 75% | 0% | 4 |
| Skid Trails | T02 | 100% | 0% | 100% | 0% | 4 |
| Suspended Yarding | T03 | 100% | 0% | 100% | 0% | 2 |
| Landings | T04 | 86% | 14% | 100% | 0% | 7 |
| Timber Sale Administration | T05 | 100% | 0% | 100% | 0% | 2 |
| Meadow Protection | T07 | 100% | 0% | 100% | 0% | 1 |
| Road Surface, Drainage and Slope Protection | E08 | 100% | 0% | 50% | 0% | 2 |
| Stream Crossings | E09 | 50% | 50% | 0% | 0% | 2 |
| Road Decommissioning | E10 | 100% | 0% | 50% | 0% | 3 |
| Control of Sidecast | E11 | 100% | 0% | 50% | 0% | 2 |
| Servicing and Refueling | E12 | | | | | 2 |
| In-Channel Construction | E13 | 100% | 0% | 83% | 17% | 6 |
| Temporary Roads | E14 | 100% | 0% | 100% | 0% | 3 |
| Water Source Development | E16 | n/a | n/a | n/a | n/a | 0 |
| Snow Removal | E17 | 100% | 0% | 67% | 33% | 3 |
| Management of Roads During Wet Weather | E20 | 50% | 50% | 100% | 0% | 2 |
| Prescribed Fire | F25 | 100% | 0% | 100% | 0% | 4 |
| Grazing | G24 | 50% | 50% | 0% | 100% | 2 |
| Common Variety Minerals | M27 | 100% | 0% | 100% | 0% | 1 |
| Developed Recreation Sites | R22 | 100% | 0% | 75% | 25% | 4 |
| Dispersed Recreation Sites | R30 | 100% | 0% | 100% | 0% | 3 |
| Vegetation Manipulation | V28 | 100% | 0% | 100% | 0% | 2 |
| Revegetation of Disturbed Areas | V29 | n/a | n/a | n/a | n/a | 0 |
| Grand Total | 2009 | 93% | 7% | 82% | 8% | **63** |

*[1] Note that effectiveness evaluations rated as "Yes" and "No" do not make up 100 percent of all monitoring points. Ratings that are considered to be "At Risk" make up the remaining percentages.*

**Table 14: BMP monitoring results for FY 2010.**

| Best Management Practice Monitored | BMPEP Evaluations | [1]2010 Implemented | | [1]2010 Effective | | |
|---|---|---|---|---|---|---|
| | | Yes | No | Yes | No | **Total Sites** |
| Streamside Management Zones | T01 | 100% | 0% | 75% | 25% | 4 |
| Skid Trails | T02 | 100% | 0% | 100% | 0% | 5 |
| Suspended Yarding | T03 | 100% | 0% | 100% | 0% | 2 |
| Landings | T04 | 88% | 12% | 88% | 0% | 8 |
| Timber Sale Administration | T05 | 100% | 0% | 100% | 0% | 2 |
| Meadow Protection | T07 | 100% | 0% | 100% | 0% | 1 |
| Road Surface, Drainage and Slope Protection | E08 | 50% | 50% | 100% | 0% | 4 |
| Stream Crossings | E09 | 50% | 50% | 100% | 0% | 4 |
| Road Decommissioning | E10 | 67% | 33% | 67% | 33% | 3 |
| Control of Sidecast | E11 | 100% | 0% | 50% | 0% | 4 |
| Servicing and Refueling | E12 | 100% | 0% | 100% | 0% | 1 |
| In-Channel Construction | E13 | 100% | 0% | 50% | 50% | 4 |
| Temporary Roads | E14 | 100% | 0% | 100% | 0% | 3 |
| Rip Rap Composition | E15 | 100% | 0% | 67% | 33% | 3 |
| Water Source Development | E16 | n/a | n/a | n/a | n/a | 0 |
| Snow Removal | E17 | 100% | 0% | 100% | 0% | 2 |
| Management of Roads During Wet Weather | E20 | 100% | 0% | 50% | 0% | 2 |
| Prescribed Fire | F25 | 75% | 25% | 100% | 0% | 4 |
| Grazing | G24 | 100% | 0% | 0% | 100% | 1 |
| Common Variety Minerals | M27 | 100% | 0% | 100% | 0% | 1 |
| Developed Recreation Sites | R22 | 75% | 25% | 75% | 0% | 4 |
| Dispersed Recreation Sites | R30 | 100% | 0% | 100% | 0% | 4 |
| Vegetation Manipulation | V28 | 100% | 05 | 100% | 0% | 2 |
| Revegetation of Disturbed Areas | V29 | n/a | n/a | n/a | n/a | 0 |
| Grand Total | 2010 | 88% | 125 | 82% | 9% | **68** |

*[1] Note that effectiveness evaluations rated as "Yes" and "No" do not make up 100 percent of all monitoring points. Ratings that are considered to be "At Risk" make up the remaining percentages.*

- Follow-up office reviews of any BMP deficiencies with implementing staff if they are unable to participate in the monitoring.
- Noxious weeds associated with ground-disturbing activities continue to be observed. The Forest botanist recommends that adding competition from native species should be enhanced by collecting native seed and spreading on sites where invasive species occur. It is recommended landings be seeded with native bromes in order to curb non-native species introduction.
- Up to 90% of timber sale activity occurs on gently sloping terrain on the Shasta – McCloud Management Unit. The current random selection of monitoring sites therefore places emphasis on activities occurring on areas where BMPs are most easily obtained on gently sloping terrain. Because of this, when activities do occur on more sloped terrain, stratified sampling will be incorporated into the random site selection.
- Native grass seed used on decommissioning and other watershed restoration projects helps to prevent the spread of noxious weeds, however to bolster erosion control and loss of soils it appears that erosion control needs to be better addressed in prescribed mixes especially in areas with soils that are particularly prone to erosion
- Timber Sale contract closures should occur during the following dry season if harvest concludes during wet weather operations.
- Continue to narrow the time gap between timber, fuels and silviculture projects such as pile burning, road closures, decommission of temporary roads, landing and skid road treatments.
- Review all multi-year timber sales and check for annual plan of operations on all sales greater than two years in length.
- Begin to revisit sites for retroactive monitoring to determine if areas with effective treatments remained effective or if additional planning measures need to be incorporated into project plans to better address long term erosion and sedimentation.

**Public Involvement:** Occurs during the NEPA process for identified projects.

**Data Location:** The results of the BMP monitoring are stored in the Regional BMPEP Database as well as on a Forest database. The Hydrology department at Forest headquarters also has the original data collection forms and annual reports.

## Watershed Restoration

**Forest Plan Standards:** Identify and treat areas with degraded watershed condition. (Ref: Forest Plan 4-25, f.)

**Monitoring Objectives:** To establish baseline conditions prior to restoration implementation. To determine if watershed restoration projects were implemented as

planned. To determine if the watershed restoration practices implemented were effective in achieving desired results.

**Methods:** Monitoring can be partitioned into three categories: 1) Long-term water quality monitoring, 2) BMP and Timber Harvest Waiver Monitoring, 3) Project Specific Monitoring. The former two categories are monitored on an annual basis according to specific protocols established by the Forest Service and either the North Coast or Central Valley Water Quality Control Boards.

**Results:** The Pit Arm Shasta Lake and French Watershed analyses were completed in 2010. Several watershed restoration projects were planned or implemented across the forest during FY 2009 and FY 2010. A few of these projects are highlighted below.

### Soldier Legacy Road Treatments

The Trinity County Resource Conservation District continued implementation of the Soldier Legacy Roads project which started in 2008. During FY 2009 there were storm patrols within the burned area of the Eagle fire along 33N41. In the spring and summer this road had seven rocked rolling dips and two critical dips installed to mitigate surface erosion and improve stream crossings. Barriers erected to temporarily close the road were removed and the road was reopened for public use. Fifty two miles of road were inventoried to support the Soldier Roads Analysis Process. In FY 2010 work centered on planning and design work for roads in the Carter Ranch area. High priority hand work was completed at stream crossings with plugged inlets at the southern portion of the Soldier RAP area.

### South Fork Mountain to Hayfork Legacy Roads Stormproofing

Again the Trinity County Resource Conservation District began implementation of this new legacy stormproofing project. Planning and staking treatment areas continues to date.

### Rattlesnake Floodplain Restoration Project

A site along the floodplain of Rattlesnake creek was used for years as a spoil disposal site. During 2009 most of the massive spoil pile was removed from the site and placed downstream in an area that had been used as a barrow area. In 2010 additional spoils were removed and the site was reshaped to promote capture of high flows back onto the floodplain.

**Public Involvement:** The public is invited for involvement during the planning phases of projects.

**Data location:** Forest Hydrology Department, Redding California.

# FACILITIES MANAGEMENT

## Road Maintenance

**Forest Plan Standard:** Schedule and perform road maintenance activities to meet management objectives. (Ref: Forest Plan page 4-16, #7a., and page 5-7, Facilities)

**Monitoring Objective:** To ensure that the Forest road maintenance program meets current regulations and direction.

**Results:**

In FY 2009, based on a total of 6,605 miles of forest roads:

1. Miles of roads maintained:

| | |
|---|---|
| High clearance roads: | 405 |
| Passenger vehicle roads: | 868 |
| Total: | 1,154 |

2. Total miles of road reconstruction = 119 miles
3. Total miles of new road construction = 0 miles
4. Total miles of road decommissioned = 19 miles

Results show that current funding is not sufficient to maintain roads at target operational levels. Only 19% of forest roads received some type of maintenance.

In FY 2010, based on a total of 6,889 miles of forest roads:

1. Miles of roads maintained:

| | |
|---|---|
| High clearance roads: | 710 |
| Passenger vehicle roads: | 529 |
| Total: | 1,239 |

2. Total miles of road reconstruction = 17 miles
3. Total miles of new road construction = 0 miles
4. Total miles of road decommissioned = 2 miles

Results show that current funding is not sufficient to maintain roads at target operational levels. Only 18% of forest roads received some type of maintenance.

**Recommendations:** Due to lack of funding, health and safety issues have become the overriding consideration for road maintenance. More roads will need to be decommissioned and "disinvested" in the future unless funding increases.

**Public Involvement:** Informal contacts, public comments and complaints.

**Data location:** Engineering department at Forest headquarters, Redding, CA.

## Dams and Bridges

**Forest Plan Standard:** Inspect dams and bridges at prescribed intervals and provide the maintenance necessary to keep them safe. (Ref: Forest Plan on page 4-16, #70)

**Monitoring Objective:** To ensure facilities do not pose a threat to public health and safety.

**Method:** Visual inspection following methods as required by the Forest Service manual.

**Data Collected:** Qualified Engineering staff completed bridge and dam inspection reports.

**Results:** The Forest is in compliance with required inspection frequencies. Inspection results were shared with the District Rangers and engineering staff. Routine maintenance of bridges is performed by road maintenance crews. Major repairs were prioritized and completed as funding permits.

Bridge contract work accomplished this reporting period meeting aquatic organism passage included the following projects:

- FY 2009 - Packers Creek Bridge on County road 324 was built;
- FY 2010 - Barker Creek Bridge on Forest Service road 32N03 was built.

**Public Involvement:** Posted information and public comments due to closures.

**Data location:** Engineering department at Forest headquarters, Redding, CA.

## Buildings and Administrative Sites

**Forest Plan Standard:** Manage, construct, and maintain buildings and administrative sites to meet applicable codes and to provide the necessary facilities to support resource management. (Ref: Forest Plan page 4-17)

**Monitoring Objective:** To ensure that buildings and administrative sites do not pose a health and safety hazard to public and employees and they meet the requirements of the applicable building codes and the Forest Service Manual (FSM).

**Methods:** Visual inspection following protocols required by the FSM. Every building is required to be inspected by qualified personnel at least once every five years in accordance with the Deferred Maintenance protocols.

**Data Collected:** Over the last 5 years, engineering staff has overseen the completion of inspection reports for every building on the forest. Inspection information, including deferred maintenance needs, were entered into the INFRA data base. Two office buildings were constructed or are being constructed at the McCloud Station. Both buildings are 2750 square foot of office area. The first was started in 2009 and completed in 2010 while the second was started in 2010 and is planned for completion in 2011. The construction of the new buildings will allow the removal of seven existing buildings eliminating a combined deferred maintenance of $3.3 million.

**Results:** The Forest was in compliance with the required inspection frequency and deferred maintenance protocols. However, current funding levels were not sufficient to maintain buildings to standard. Funding was primarily dedicated to correcting health and safety deficiencies. The deferred maintenance backload continued to increase. Work was conducted to dispose of buildings identified for decommissioning in the Facilities Master Plan.

**Recommendations:** Perform maintenance work to eliminate health and safety concerns and reduce deferred maintenance backlog. Continue efforts to dispose of buildings.

**Public Involvement:** Minimal public involvement is required unless the building is historical or the building is to be disposed.

**Data location:** Engineering department at Forest headquarters, Redding, CA.

## Potable Water Sources

**Forest Plan Standard:** Monitor potable water sources according to the Safe Drinking Water Act and other regulatory health requirements. (Ref: Forest Plan page 4-16, #7p.)

**Monitoring Objective:** To ensure potable water sources provide safe water for public and employee use.

**Methods:** All potable water sources were tested in 2009 and 2010. Routine bacteriological water samples were tested at State certified labs. When repeat samples confirmed bacteria, the State/County regulatory agency provided public notification and mitigation measures for public water systems. Federal, State and/or County laboratory chemical monitoring testing schedules were followed. There are approximately 40 water systems monitored by the Forest.

**Results:** The drinking water program is monitored according to regulations to ensure that water quality is being maintained to standard. All official drinking water system records are documented per Forest Service Manual 7400 (Public Health and Pollution Control Facilities). The forest maintains a computer-based Drinking Water System inventory for each drinking water system, including physical data, maintenace, and monitoring testing results. Monthly bacteriological testing results were approximately the following: In 2009, 9% of routine tests and 3% of repeats were positive and in 2010, 3% of routine tests and 1% of repeats were positive.

**Recommendations:** Continue monitoring to standard and using the water system and sampling inventory database. Begin contracting water sampling and testing to provide better consistency and timely accountability to meet regulatory standards. Provide employee water system/sampling training with supportive information accessible to employees on forest intranet. Continue to review drinking water systems at shared interagency facilities and special use permits. Increasing costs for implementing the drinking water program are likely to continue.

**Public involvement:** If substandard results are found from repeat testing, the public is notified within 24 hours and all faucets at the site are posted “non-potable” until water

tests are bacteria free. The public may also fill out complaint forms available at recreation facilities or call the Forest Service to report drinking water concerns.

**Data location:** Engineering department at Forest headquarters, Redding, CA.

# CHAPTER 4. CONTRIBUTORS AND ACRONYMS

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The following individuals provided information for inclusion in this report.

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# ACRONYMS

The following table contains definitions for all acronyms used in this document.

| Acronym | Definition | Acronym | Definition |
|---|---|---|---|
| ACS | Aquatic Conservation Strategy | MMBF | Million Board Feet |
| AMA | Adaptive Management Area | NEPA | National Environmental Policy Act |
| ARRA | American Recovery and Reinvestment Act | NRA | National Recreation Area |
| ASQ | Allowable Sale Quantity | NRIS | Natural Resource Information System |
| BBS | Breeding Bird Surveys | NSO | Northern Spotted Owl |
| BMP | Best Management Practice | OHV | Off Highway Vehicles |
| BMPEP | Best Management Practices Evaluation Program | PCT | Pacific Crest Trail |
| CCB | University of Washington Center for Conservation Biology | POC | Port-Orford Cedar |
| CCC | California Conservation Corps | PSW | Pacific Southwest Research Station |
| CCF | Hundred Cubic Feet | RAC | Resource Advisory Committee |
| CWPP | Community Wildfire Protection Plan | RFA | Recreation Facility Analysis |
| CE | Categorical Exclusion | ROD | Record of Decision |
| CVWQCB | Central Valley Water Quality Control Board | RSI | Recreation Site Improvement |
| DFG | Department of Fish and Game | SCI | Stream Condition Inventory |
| EA | Environmental Assessment | SFMU | South Fork Management Unit |
| EIS | Environmental Impact Statement | SMMU | Shasta-McCloud Management Unit |
| FACTS | Forest Service Activity Tracking System | T & E | Threatened and Endangered |
| FEIS | Final Environmental Impact Statement | TCFSC | Trinity County Fire Safe Council |
| FERC | Federal Energy Regulatory Commission | TESP | Threatened, Endangered, and Sensitive Plants |
| FSM | Forest Service Manual | TFRC | Trinity Forest Resources Council |
| FY | Fiscal Year | TIM | Timber Information Management |
| INFRA | Infrastructure | TRMU | Trinity River Management Unit |
| INPA | Invasive Plants | TRRP | Trinity River Restoration Program |
| LEIMARS | Law Enforcement and Investigations Management Attainment Reporting System | TSI | Timber Stand Improvement |
| Forest Plan | Land and Resource Management Plan | USDA | U.S. Department of Agriculture |
| LSR | Late Successional Reserve | USDI | U.S. Department of Interior |
| LSRA | Late Successional Reserve Assessment | WA | Watershed Assessment |
| MAPS | Monitoring Avian Productivity and Survivorship | WMA | Weed Management Area |
| MBF | Thousand Board Feet | WRTC | The Watershed Research and Training Center |
| MLSAs | Managed Late-successional areas | | |