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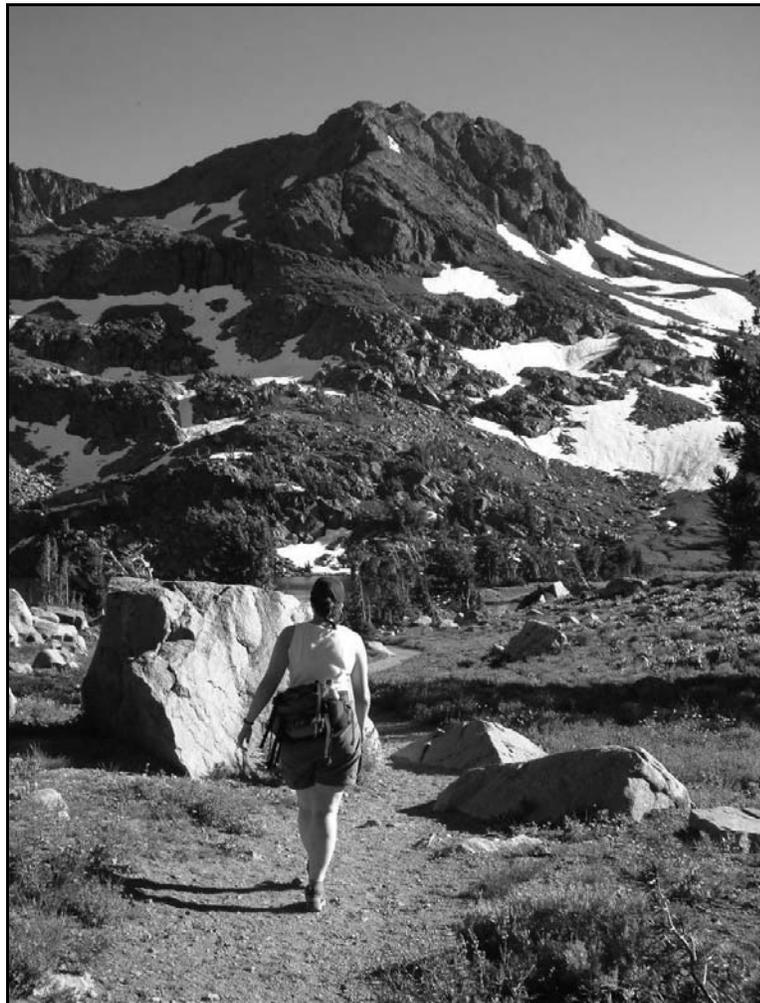
Forest
Service

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Eldorado National Forest

Monitoring and Evaluation Report FY 2006



For Information Contact: Sue Rodman
100 Forni Road
Placerville, CA 95667
530-621-5298

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Contents

Introduction	4
Monitoring Strategy	5
Watershed Monitoring, including Best Management Practices	6
Geomorphology and LiDAR	19
Landslides	19
Abandoned Mine Sites	19
LiDAR	19
California Spotted Owls	20
CA Spotted Owl Canopy Cover Study	20
Long-term Monitoring of Activities in HRCAs	21
Sensitive Plant Monitoring	23
Range Monitoring	25
Fire Prevention Education	26
Recreation	26

INTRODUCTION

Located in the Central Sierra Nevada region, the Eldorado National Forest is classified as an Urban National Forest. It is located one hour from the metropolitan area of Sacramento with a population of over one million people, and two to three hours driving time from the San-Francisco Bay area with a population of over six million. The Forest therefore plays a vital role in the environment, health, and well being of over seven million people.

The Eldorado National Forest is an ideal place for people seeking to escape from busy urban lifestyles. Its climate and topography offers a wide range of recreational opportunities both winter and summer, including hiking, fishing, camping and cross-country and downhill skiing.

The Forest is bordered to the north by the Tahoe National Forest, to the east by the Lake Tahoe Basin Management Unit and Humboldt-Toiyabe National Forest, and to the south by the Stanislaus National Forest. The western boundary interfaces with private lands in a complex pattern of ownership.

Physical Setting

The Forest encompasses a total of 789,994 gross acres, which includes 190,270 acres of private ownership. The forest ranges in elevation from 1,000 feet in the foothills to more than 10,000 feet above sea level along the Sierra Crest. The mountainous topography is broken by the steep canyons of the Mokelumne, Cosumnes, American, and Rubicon Rivers. Plateaus of generally moderate relief are located between these steep canyons. A Mediterranean type climate extends over most of the Forest with warm, dry summers and cold wet winters.

Natural Resources

The Eldorado National Forest has two popular wilderness areas: Desolation Wilderness (63,960 acres) and the Mokelumne Wilderness (105,165 acre). The wilderness areas are designated by Congress to be as free as possible from the impact of human use. The Forest provides habitat for 320 species of birds, mammals, amphibians, and reptiles. Vegetation cover consists of chaparral, conifer, fir, and sub alpine trees.

Water is a major resource on the Eldorado National Forest. The average acre on the forest receives about 56 inches of precipitation annually. The surface water of Eldorado National Forest is of excellent quality all year around and yields approximately 1.4 million acre-feet annually. Numerous streams, natural lakes, and man-made reservoirs provide key features for a substantial share of all recreation activities. The forest has about 611 miles of fishable streams in four major drainage systems. Water flowing from the forest is used for hydroelectric power production as well as municipal, industrial, and agricultural purposes. There are six major hydroelectric operations in the forest.

Recreation

The Eldorado National Forest is divided into four Ranger districts: Amador, Georgetown, Pacific and Placerville. A range of developed sites includes campgrounds, picnic grounds, boat ramps, ski areas, scenic vistas, observation and interpretive sites. There are a number of privately developed facilities such as winter sport sites, recreation residences, lodges, resorts and clubs that are entirely or partially within the Forest. Because the Eldorado National Forest is situated near the 1849 California gold discovery site on the American River at Coloma, and boasts numerous gold-bearing rivers and streams, visitors to the Forest can still pan for Gold.

One of the most popular destinations in the Eldorado National Forest is the Desolation Wilderness Area. Because of its beauty and accessibility, the Desolation Wilderness Area is one of the most heavily-used wilderness areas in the United States. Lover's Leap near Twin Bridges on US50 is a massive rock outcrop, famous for some of the finest rock climbing in the Sierra Nevada Mountains. The Forest also offers winter recreation with impressive backcountry ski trails, the spectacular scenery of the Carson Pass National Scenic Byway, and a system of off-highway vehicle trails.

Special Resources

The Eldorado National Forest also supports activities related to forest health management through the Institute of Forest Genetics and the Placerville Nursery. The Institute of Forest Genetics conducts research in the area of genetic diversity to aid overall ecosystem management and features the Eddy Arboretum, which contains one of the largest collections of conifers from around the world.

The Placerville Nursery is one of a small number of seedling Forest Service nurseries nationally, and produces seedlings for re-forestation after fires and other ecological restoration. The Nursery services all eighteen forests in the Pacific Southwest Region of the USDA Forest Service.

MONITORING STRATEGY

Land and Resource Management Plan

The Eldorado Forest Land and Resource Management Plan (Forest Plan) is the basis for management of all the Forest's resources. This report constitutes the Eldorado National Forest's Monitoring and Evaluation Report for fiscal year 2006 (FY06) as required by the Forest Plan. The Forest Plan is the integration of direction from the 1989 Land and Resource Management Plan, as amended by the 2001 Sierra Nevada Forest Plan Amendment and the 2004 Supplemental ROD for the Sierra Nevada Forest Plan Amendment. The management direction of the Land and Resource Management Plan is based on land allocations to Management Areas and the accompanying Standards and Guidelines from these three decisions. Standards and Guidelines form a hierarchy of Forest management direction as the basis for combined and coordinated management guidance. In all cases, this hierarchy of direction describes how resources are to be managed.

The overarching purpose of monitoring is to provide feedback to the Forest that enables evaluation of the achievement of ecosystem health and sustainability and improvement of management to better meet the expectations of the public.

Monitoring Requirements

A number of laws authorize the Forest Service to monitor and evaluate its programs and activities. Such provisions are a part of the National Forest Management Act, the Forest Ecosystems and Atmospheric Pollution Act, the Cooperative Forestry Assistance Act, the Clean Water Act, and most recently, the Government Performance and Results Act (GPRA) of 1993. To comply with the provision of the GPRA, the Forest Service developed and implemented a National Strategic Plan in 2002.

The goals and objectives of the National Strategic Plan are outcome focused, identifying results that will be achieved over a period of time, typically longer than 1 or 2 years. These outcomes are to be achieved by managing the lands and resources of the National Forest System. The National Strategic Objectives for Goals 1 and 2, which are related to the FY06 Forest Plan monitoring, are shown below.

Goal 1 - Ecosystem Health: Promote ecosystem health and conservation using a collaborative approach to sustain the Nation's forests, grasslands, and watersheds.

- National Strategic Objective 1a: Improve and protect watershed conditions to provide the water quality and quantity and the soil productivity necessary to support ecological functions and intended beneficial water uses.
- National Strategic Objective 1b: Provide ecological conditions to sustain viable populations of native and desired nonnative species and to achieve Objectives for Management Indicator Species (MIS)/ focal species.
- National Strategic Objective 1c: Increase the amount of forests and grasslands restored to or maintained in a healthy condition with reduced risk and damage from fires, insects and diseases, and invasive species.

Goal 2 - Multiple Benefits to People: Provide a variety of uses, values, products, and services for present and future generations by managing within the capability of sustainable ecosystems.

- National Strategic Objective 2a: Improve the capability of the Nation's forests and grasslands to provide diverse, high- quality outdoor recreation opportunities.
- National Strategic Objective 2b: Improve the capability of wilderness and protected areas to sustain a desired range of benefits and values.
- National Strategic Objective 2c: Improve the capability of the Nation's forests and grasslands to provide desired sustainable levels of uses, values, products, and services.
- National Strategic Objective 2d: Increase accessibility to a diversity of people and members of underserved and low- income populations to the full range of uses, values, products, and services.
- National Strategic Objective 2e: Improve delivery of services to urban communities.

The 1989 Land and Resource Management Plan identified 73 activities, effects, or resources to be measured. As a result of these duplicated and overly ambitious monitoring programs, and the high costs of the monitoring identified in Forest Plans, the Forest began evaluating various monitoring strategies due both to changes in management needs and budgetary limitations. The Eldorado National Forest's accomplishments for current monitoring have been summarized and organized for this report to reflect elements from National Strategic objectives while providing monitoring information in logical resource area groupings. The information presented in this report is shown using both tables and narrative discussions.

BEST MANAGEMENT PRACTICES -- MONITORING FOR WATER QUALITY

This section of the Forest Plan Monitoring Report summarizes the performance of the Eldorado National Forest in meeting the surface water quality protection commitments to the California Regional Water Quality Control Board, Central Valley Region¹ and the State Water Resources Control Board (SWRCB)². It addresses the adequacy and effectiveness of the USFS vegetation management program in protecting water quality as well as the overall efficacy of the forests water quality management program, specifically the implementation and effectiveness of Best Management Practices (BMPs). Included are identification of the types of shortcomings encountered, actions taken to make improvements as well as elements where additional improvement may be needed to facilitate opportunities for adaptive management.

Random BMP evaluations from 1992 through 2005 shows that BMP measures were effective 93% of the time and implemented 90% of the time. These results as well as the tables of specific results, the maps of the last 410 BMP evaluations collected over the last 14 years (370 of which are random) as well as additional locations where more intensive instream monitoring efforts demonstrate the diligence of the Eldorado NF to manage an effective water quality monitoring program.

On-site evaluations are the foundation of the BMPEP and are therefore the focus of this summary. The Eldorado NF conducts additional instream monitoring including habitat condition, fish & amphibian absence/presence, and R5 stream condition inventory.

Effects from the existing weather cycle commonly influence perceptions of BMP effectiveness. In years where winter storms are mild, erosion control and water quality protection measures are very effective and there is a the lack of visible damage. Storm events such as occurred last winter challenge all BMP implementation effectiveness. Last year was a reminder that our logging and fuels treatment practices rarely result in major failures, however, the weak link is the road system. One failed culvert on an insloped road can cause major damage down slope. Road maintenance continues to be a challenging issue on the Eldorado NF.

For some evaluations there is a low number of evaluations in the sample pool. Forest history suggests that conducting more evaluations will improve the ability to measure effectiveness. The forest has the continued need to increase monitoring efforts to improve reliability of results.

BMP evaluations that include photo documentation, narrative descriptions, and complete field forms with descriptions of any issues documented in the comment sections, helps insure that database interpretations match the conditions observed.

Onsite BMPEP Evaluations

Objectives

Onsite evaluations are used to assess both BMP implementation and effectiveness. Implementation evaluations determine the extent to which planned, prescribed and/or required water quality protection measures were actually put in place on project sites. Effectiveness evaluations gauge the extent to which the practices met their water quality protection objectives.

Methods

There are 29 onsite evaluation protocols used to assess the implementation and effectiveness of individual BMPs or groups of closely related BMPs. Additional details can be found in *Investigating Water Quality in the Pacific Southwest Region, Best Management Practices Evaluation Program (BMPEP) User's Guide (USFS, 2002)* and *Water Quality Management for National Forest System Lands in California (USFS, 2000)*.

For BMP implementation, evaluators are asked a variety of specific questions to determine whether the project was executed on the ground as planned and described in project documents. A range of possible scores is allocated to each question, depending on its relative importance and the degree to which a particular requirement is met (e.g., whether the project exceeds, meets, departs trivially, or departs substantially from requirements). Scores for all implementation questions are then summed and compared to a pre-determined threshold to conclude whether a given suite of BMPs were implemented.

BMP effectiveness is determined through indirect measures of water quality protection, including observations (e.g., evidence of sediment delivery to channels) and quantitative measurements (e.g., amount of ground cover, percent of stream shade). A scoring system similar to that used for BMP implementation is used to determine BMP effectiveness.

For sites with poor effectiveness, evaluators are asked to identify reasons and suggest corrective actions, and to estimate the degree, duration, and magnitude of any existing or potential impacts to water quality. Because of the use of indirect measures to evaluate BMP effectiveness, poor scores represent potential, rather than actual, impairment to beneficial uses from a given activity.

Onsite evaluation protocols are applied to both randomly and non-randomly selected project sites. The number of random evaluations to be completed each year is assigned by the Regional Office, based on: 1) the relative importance of the BMP in protecting water quality; and 2) those management activities most common on the individual Forest. Forests supplement these randomly selected sites with additional sites based on local monitoring needs, such as those prescribed in an environmental document, or as required under the Silvicultural Waiver for Non Point Source Discharges.

Results & Discussion

There are 410 on-site BMP evaluations that have occurred on the Eldorado National Forest over the last 14 years. The random sampling monitoring data from 1992 through 2005 show that the BMP measures were effective 92% of the time and implemented 88% of the time for the 306 random evaluations. These sites were randomly selected to avoid biasing results.

Best Management practices are effective at protecting against non-point source pollution as evidenced by the high percentage of evaluations found to be effective. This illustrates that the majority of the areas under Forest Service management have good water protection practices. This success is an accomplishment; and it is important to continue to improve our practices and prevent non-point source pollution to the extent feasible. Continuously improving management through the feedback from monitoring enables the Forest to improve future actions to benefit aquatic ecosystems and the associated beneficial uses of water.

Annually one would expect that the overall effectiveness of the program would improve. However, precipitation variability in some years test land management practices more rigorously than others. Following years with higher than average precipitation the effectiveness of BMPs may appear to decline. Where the number of evaluation increases, it gives greater confidence in

the data collected as being representative of the population of treatments over the entire forest over time.

Overall effectiveness of practices evaluated this last year found the following: Ten of the activities were found to be 100% effective at protecting water quality. One of the activities, stream crossings (E09), had 25% of the BMPs monitored as ineffective.

Methods to Improve Poor Ratings or Improvements Made

Stream Crossings

The evaluations for stream crossings resulting in poor ratings showed that 3 of the 4 areas selected for monitoring had no recent reconstruction or maintenance over the last 10 years. However, two of these three were found to be holding up quite well. All 4 evaluations were rated as having diversion potential; if the culverts were to fail flow would be expected to travel down the roadway. In current reconstruction work, crossings are usually redesigned so that in the event the culvert pipe plugs, a low point is created that would intercept the water flow on the road surface and divert it back into the stream channel. The issue of existing stream crossings has not been addressed on a wide scale since there has been little recent reconstruction. The cost-benefit of redesigning existing crossings needs to be evaluated more closely before initiating further action.

Roads

Roads on the Eldorado NF a primary source of erosion and sedimentation as compared to other management activities. The forest has made great strides prioritizing treatments for roads to address resource issues (Forest Roads Analysis 2002, 5th field watershed landscape analyses (Middle Fork Cosumnes, North Fork Cosumnes, Chili Bar-Slab and Lower Middle Fork American River) as well as the present EIS for designating routes for Off Highway Vehicle Use, which has the potential to close lengths of non-system and system routes that pose threats to meeting water quality objectives.

2006 Road Damage Assessment

2006 was no exception to the general finding that roads on the Eldorado NF are a primary source of erosion and sedimentation as compared to other management activities. A continuing Forest wide road reconnaissance was initiated following the December 31st storm event to document road damage and needed repairs. The major warm storm events of December 31 and April 4 resulted in wide-spread road drainage failures, primarily due to plugged culverts, undersized culverts, failed graded dips or water-bars, and inside road ditch flows that overwhelmed cross drains. High runoff associated with the 2004 wildfire in the Fred and Power Fires resulted in concentrated flows from road drainage into burned areas with substantial erosion on slopes below roads. (TenPas 2006), (Markman 2006), (Hierholzer (2006).

The Eldorado conducted extensive winter and spring forensic monitoring of road conditions throughout the entire Forest. Forest Service road maintenance crews immediately began emergency repairs on the sites in most urgent need of repair. Priorities were established with the highest priority being public safety, then potential for additional resource damage, followed by access and user comfort needs. This information is being analyzed to determine further repair

priorities and possible funding sources. Data will be continually updated and used to identify priorities as new damage is reported and as repairs are made or scheduled.

The Forest is actively pursuing multiple sources of road repair funding and equipment. FHWA representatives have agreed 25 sites totaling \$1.4 million dollars qualify for ERFO repair funds. Forest road equipment continues to work on repairs, as do contractors and cooperators.

Forest Monitoring Targets

Annually the Forest is assigned a target number of evaluations. For 2005, the Eldorado National Forest was assigned 50 evaluations and completed 36. Some targets were exceeded while other activities fell short on the number of required evaluations. There were large wildfires on 2 ranger districts on the forest last year, therefore, resources available to complete monitoring were more limited than normal.

Results by Ranger District

The forest has 4 individual ranger districts responsible for the land management on their units. Table 1 below illustrates the numerical distribution of evaluations.

Table 1. Monitoring by Ranger District

	Year(s)	Eldorado National Forest Ranger Districts			
		Pacific	Placerville	Georgetown	Amador
Completed BMP Evaluations	1992-2005	101	127	102	68
Additional Instream monitoring sites	1992-2003	27	34	51	37

In-stream Monitoring

Aquatic resource monitoring occurring on the Eldorado National Forest includes Stream Condition Inventories (SCI), California Stream Bioassessment Procedure (CSBP), temperature data, stream bank disturbance (Sierra Nevada Forest Plan Amendment 2004), Lotic and Lentic Proper Functioning Condition Assessments (USDI 1994 and 1998), research plots established by accredited universities and various project stream surveys. Monitoring points with quantitative data were established with the goal to repeat measurements at benchmarked locations.

Between 2001 and 2005 the California Department of Fish and Game planted 62,200 pounds of catchable brown trout and 135,000 brown trout fingerlings. The number of planted brown trout fingerlings has remained stable since 2002 whereas the number of pounds of planted catchable brown trout has decreased slightly since 2003. As a result of stocking efforts, there are naturally reproducing populations of brown trout in many lakes and streams in the Eldorado National Forest.

Rainbow trout comprise approximately 85 percent of the total planting allotment of catchable trout on the Forest. Between 2001 and 2005 the California Department of Fish and Game planted 143,190 pounds of catchable rainbow trout and 129,400 rainbow trout fingerlings. The number of pounds of rainbow trout planted on the Eldorado National Forest has declined by 33 percent between 2001 and 2005 whereas the numbers of planted fingerlings has increased slightly since 2001. Presently on the Eldorado National Forest, rainbow trout are known to occupy 581.78 km

(361.50 mi) of stream and are suspected to be present in an additional 260.89 km (162.11 mi) of stream.

Project Instream Monitoring

Herbicide and Pesticide Monitoring

Monitoring for herbicide and pesticide applications has taken place over the last 14 years through the collection of over 350 water samples that have been taken for both pre-application and post application. Monitoring sites are established along perennial streams considered to have the highest potential for contamination. Post application monitoring occurs following the first storm event that produces runoff. Adjustments to buffers along perennial and seasonally wet areas have been made over time based on monitoring results for specific chemicals. Typically sampling results in a “No Detection” from lab results, with occasional trace detections that are typically below water quality standards. Detailed environmental planning and monitoring plans are developed to address any project on Forest land that proposes to chemically treat an area.

Recreational Trail Monitoring

In addition to the BMP monitoring that occurs for recreation, additional monitoring of recreational trail segments also occurs. To insure protection of soil and water resources trails that closely parallel streams or those having perennial and seasonal stream crossings are monitored. The region is presently in the process of coordinating the development of a new BMP monitoring evaluation that will specifically monitor recreational trails using the State OHV Division existing trail monitoring requirements.

Hydro-electric Facility Relicensing Studies

Surveys conducted in association with hydro-electric facility relicensing have occurred over extensive areas on the forest within the Mokelumne River, South Fork American River and the Middle Fork American River. Maps as well as results of data collected by Sacramento Municipal Utilities District are available at the following website:
http://hydrorelicensing.smud.org/docs/docs_aqu.htm.

Effectiveness and Forensic Monitoring Summary

Forensic and BMP effectiveness monitoring is required when projects occur in watersheds that are over their threshold of concern (TOC), regardless of the cause for exceeding TOC.

Amador Ranger District Implementation Monitoring

The following eleven Amador Ranger District projects were subject to forensic and effectiveness monitoring due to their location within watersheds over TOC. The cause for these watersheds to be over TOC was the impacts from the 2004 Power wildfire, not as a result of Forest Service activities over the last 10 years.

- Cobeat Commercial Thin Project
- Dubear Commercial Thin Project
- Bear River Fire Salvage (Power Fire)
- Mokey Bear Fuels Reduction Project (Power Fire)
- Camp Creek Fire Salvage (Power Fire)
- Cole Creek Fire Salvage (Power Fire)
- Ellis East Fire Salvage (Power Fire)

- West Panther Timber Sale (Ham's Station Project)
- Rocky Knob Fire Salvage (Power Fire)
- East Panther Fire Salvage (Power Fire)
- Scott Creek Fuels Reduction (Road reconstruction only)

The winter of 2005/2006 was dominated by two warm storms, one on December 31, and one on April 4th. Both storms resulted in rain-on-snow events and caused considerable damage to forest roads. Spring was wetter and colder than normal and left much of the project areas inaccessible for monitoring until late spring. Forensic monitoring was conducted throughout the winter as road access allowed. The Power Fire became the main focus of monitoring for the Amador District. This 15,000 acre wildfire left large areas devoid of vegetative ground cover. Logging of Forest Service lands, coupled with intermingled logging of private lands put the effectiveness of BMP measures to an extreme test.

Power Fire Salvage Logging and Fuels Treatment Summary

It became evident during forensic monitoring of the Power Fire during the December 31 storm event that major damage was occurring as a result of overloaded or plugged culverts. Extensive damage occurred from slumps, slides and plugged culverts along roads. Emergency repairs were immediately implemented within the Power Fire to stabilize and drain as much as possible along the East Panther Road due to its proximity to Panther Creek. Additional but less severe road damage occurred throughout the lower elevations of the Power Fire Area. Forest maintenance crews focused on opening up what culverts they could. A second major rain on snow event occurred in April causing additional damage to the road system within the Power Fire area. Damage to forest roads was by no means limited to the Power Fire. Efforts were undertaken to monitor all system roads on the district, and prioritize repairs (ENF Road Damage Assessment). Extensive inspection of areas logged last season indicate good effectiveness of BMPs utilized within logging units, given the severity of the winter and increased runoff due to the burned area. Two significant failures were located and documented in the Failure report submitted to CVWQCB, dated May 4. One appears to be from a failure to recognize runoff potential within a swale, leading to concentrated flows into a landing and road. The second is the result of road culvert failures on a system road causing increasing flows through a helicopter logged unit. Repair is scheduled for this fall. Effectiveness monitoring is continuing in the Power Fire Area due to the potential for undetected damage. Contractor obligations for maintenance of erosion control structures are required for one year. As intensive monitoring continues this summer, required BMP related work and completion will be documented. The district is maintaining a photo point file of before and after erosion control conditions.

Fuels Reduction Projects

Commercial logging of fuel reduction projects (thinning) did not occur on the Amador District in 2005 due to the focus on removing the large volume of fire salvage logs. Fuels reduction work was generally limited to grapple piling contracts and pile burning. Certification of erosion control BMPs is required prior to authorizing payment. No failures due to grapple piling or pile burning were noted.

Failure and Violation Reporting

Three Amador Ranger District hillslope failures in the Power Fire, were reported to the CVWQB during January – March 2006. These hillslope failures affected roads, landings and streamcourses, as reported by the forest hydrologist and by Amador District personnel. Rehabilitation efforts are continuing. Repair of these sites is ongoing with assistance and funding being obtained from multiple sources, including ERFO, SPI coop agreements, salvage sale revenues, Knudsen-Vandenburg deposits, Burned Area Emergency Restoration (BAER) funds and appropriated ENF road maintenance funds.

Observation of Pre and Post Fire Salvage Turbidity Monitoring of Streams Affected By Power Fire

1. Cole Creek has very low suspended sediment concentrations and turbidity readings during all flows. The Power Fire and salvage operations have not changed this.
2. Beaver Creek, East Panther Creek, and the tributary of Beaver Creek carried a lot of ash (seen as black in the water samples) during the first winter after the Power Fire. The tributary of Beaver Creek carried the most ash.
3. During the storm of April 4, 2006, most of the material in the samples was sediment - there wasn't much ash.
4. A ten-year storm event or greater produces a lot of sediment from all streams (with the exception of Cole Creek).
5. Storms of less than one inch don't produce much of an increase in suspended sediment concentration or turbidity.
6. Snow elevation level is important. There was a much larger increase in suspended sediment and turbidity when the entire area was hit with rain because snow levels were above 6,000 feet.
7. For all streams, electrical conductivity goes down as flow increases. Electrical conductivity is a reflection of the concentration of dissolved ions in the water.
8. For any given stream, pH doesn't change much.
9. The data collected cannot be used to determine if salvage logging has increased sediment delivery to streams, because there was only one large storm the first winter after the Power Fire and prior to salvage logging.

Georgetown Ranger District Implementation Monitoring

The Star Fire Reforestation was the only project to operate in a watershed over TOC. Effectiveness and Forensic Monitoring was performed for 132 acres of inter-planting, 333 acres of herbicide treatment, and 41 acres of hand release treatments. Access to the Star Fire Reforestation project area immediately following storm events was not possible due to snow and wet native surfaced roads, but forensic monitoring was conducted as soon as possible following the major storm events of April 2006. No failures of mitigation measures and management actions were observed in early May 2006. Water sampling resulted in no detection of herbicides, and effectiveness monitoring found all streamside buffer zones were intact with no observable violations.

Implementation monitoring for Georgetown District projects covering approximately 190 acres of mastication, plus adjacent tractor piling found that BMP implementation met erosion prevention requirements upon completion of the work and post-storm.

Pacific Ranger District Implementation Monitoring

Implementation Monitoring

Implementation monitoring site inspections conducted prior to the winter period are designed to assure that management measures are properly installed. Maps displaying locations of harvest activities, including general skid trail patterns, stream crossings, landings, temporary roads, and transportation facilities are available in the district maintained Silvicultural Water Waiver Monitoring File.

Specific notes or comments on projects:

2004 Vegetation Management in Conifer Plantations

Ground applied herbicide treatment occurred during the spring of 2006. Project was inspected daily. Stream zone buffers were established and adhered to during application. Inspector reports are in project file. Water quality monitoring occurred prior to herbicide application, no post-herbicide water quality samples were taken because there was no storm event within the prescribed post-herbicide period that triggered the water sampling protocol. Water sampling reports are in project file.

Cassowary Road Maintenance Project:

Harvesting of roadside hazard trees occurred during the fall of 2005 and spring of 2006. A wet weather operations agreement was signed and implemented on 11/14/05.

Crimson Tide Forest Heath Project:

This project consisted of post harvest Force Account tractor piling in the fall of 2005. The project area was reviewed by the District Timber Management Officer during the spring of 2006, shortly after the snow left the area. Project area is in good shape, gates had been kept closed during the winter to reduce impacts from vehicles. All erosion control work was completed during October 2005, prior to the on-set of heavy seasonal precipitation.

Western Traverse Fuel Reduction Project:

This project consisted of 16 acres of mastication during the fall and early winter of 2005. No problems were identified when the Area treated was visited by the District Timber Management Officer and the supervisory equipment operator during the spring of 2006. All treated areas retained heavy quantities of masticated material as ground cover.

Algorythm Road Mtc Project:

Harvesting of roadside hazard trees occurred during October-November of 2005. A wet weather operations agreement was signed and implemented on 11/14/05. All operations were completed and Forest Service reviewed and accepted erosion control work (181 dated 11/14/06).

Forest Guard Fuel Reduction Project:

Project began operations on 1/4/06, with operations to occur "over-the-snow" when adequate snow depth was present. During periods of rain, operations ceased. Skidding was permitted only when frozen conditions are present across "corduroy" snow bridge creek crossing. Night-time operations were used to take advantage of frozen conditions when daytime operations ceased because of warm temperatures. A site inspection of the corduroy section of skid road found that

the crossing had been removed, no soil disturbance was apparent, and the water was clear (181 dated 3/23/06). BMP Evaluation completed on 3/23/06 identified no problems, with no rilling, and no slope failures associated with crossing.

Effectiveness and Forensic Monitoring

Forest Guard Project

One project operated in a watershed over its TOC during the reporting period. Small portions of the Forest Guard Project were in a watershed (Fresh Pond Watershed) over the TOC. Most of the Forest Guard Project is located in watersheds that are not over their TOC. No specific areas of concern were identified in the CWE analysis for this project. The lack of specific concern is due to a very small amount (<2%) of the Riparian Conservation Area (RCA) being affected.

There were no fall or winter operations on the Forest Guard Project within the Fresh Pond Watershed. All operations within the Fresh Pond watershed occurred in the April and May of 2006 timeframe. There were no storm events sufficiently large as to trigger a forensic field review of this project during the reporting period.

Placerville Ranger District Implementation Monitoring

Effectiveness and Forensic Monitoring

Ground disturbing activities occurred on two projects located in watersheds that are over the TOC, and are thus under effectiveness and forensic monitoring requirements. The projects are the Fred Fire Salvage Sales and the Fred Fire Tree Planting. Tree planting consisted of hand planting seedlings and hand scalping a 3 foot radius around the seedling. No additional water silvicultural waiver monitoring of tree planting is mentioned here due to the negligible impacts of this activity.

The winter of 2005/2006 was dominated by two warm storms, one on December 31, and one on April 4th. Both storms resulted in widespread road drainage failures. Spring was wetter and colder than normal and left much of the Fred Fire project area inaccessible until late spring. Forensic monitoring was conducted by sale administrators, hydrologists, and a geologist throughout the winter, as road access allowed. The effectiveness of erosion control measures and stream course protection implemented during logging was good, given the intensity of the storms, the recently burned landscape, and logging operations on Forest Service and intermingled private lands. However, numerous road drainage failures were found, (ENF Road Damage Assessment). As failures were found, emergency repairs were made to project roads, primarily cleaning of plugged culverts and slump removal. Additional erosion occurred below some roads due to concentrated flows from overwhelmed road drainage facilities. Environmental analysis is under way to allow for the removal of two culverts from road 11N42, below Fred Fire Salvage tractor unit T-5 where movement in a historic slide above this road threatens the road. Pulling the culverts and reshaping the bank will eliminate the potential for culvert failure while reducing future maintenance costs.

Current court litigation has suspended operations, it is unknown if operations will resume. Final acceptance of erosion control measures remain to be completed on the Fred Fire Salvage sales, as contractors are responsible for maintenance of erosion control measures for one year

Failure and Violation Reporting

Two slope failures occurred on or adjacent to the Fred Fire area. A Slope Failure Report, dated 5/18/06 was sent to the CVWQCB. Both failures were likely triggered by excessive rain and snow on historic slope failures. It is unlikely that recent salvage logging caused either failure. Repair of these two sites is ongoing with assistance and funding being obtained from multiple sources, including Emergency Repair Federal Own (ERFO), SPI coop agreements, salvage sale contract modifications, Knudsen-Vandenburg deposits, Burned Area Emergency Restoration (BAER) funds and appropriated ENF road maintenance funds.

Forest-wide Monitoring

Herbicide Monitoring

Eight perennial streams were monitored for herbicides in 2005. All of the monitoring sites on these streams are downstream of areas that were sprayed with herbicides.

- ❑ Herbicides were not detected in any of the water samples from the monitored streams.
- ❑ Water samples were taken from all streams prior to herbicide spraying. Two streams – Fry Creek and St. Pauli Creek – were also sampled following a runoff-producing rainfall event. For the remaining six streams, a runoff-producing rainfall event did not occur within three months following herbicide application.
- ❑ The cost of testing of samples at a water quality laboratory was \$1,966.

Descriptions of In-stream Monitoring

Rosgen Channel Typing Surveys

There are 89 additional sites surveyed in association with the evaluation of grazing lands in meadows using a Rosgen survey approach (Jones & Stokes 1995). At these sites data collected includes reach length, gradient, channel cross-sections including width to depth and entrenchment ratios, evaluated flood prone areas, sinuosity and substrate pebble counts. These surveys occurred on stream reaches within the following areas: Jones Fork Silver Creek, South Fork Silver Creek, Willow Watershed, Lyons Creek and on unnamed tributaries in the Upper American River.

R5 Stream Condition Inventories (SCI)

The Eldorado NF typically collects additional data in conjunction with SCIs (since about 1999) that includes measurement of aquatic macroinvertebrates utilizing the California Stream Bioassessment Procedure (CSBP), water quality, and water temperature (using thermographs over approximately two seasons).

There are 13 permanent SCI reaches on the Eldorado National Forest beginning in 1994 through 2003. These include: Camp Creek, Caples Creek, Dogtown, East Panther Creek, NF Cosumnes River, Snow Canyon, Sopiago Creek, South Fork Silver Creek, South Fork Long Canyon, Steely Fork Cosumnes River (above the bridge crossing at road 9N73), Steely Fork Cosumnes River (below the bridge crossing), and Ladeaux Meadow. Two of these reaches were resurveyed after the 1997 flood event: Sopiago Creek and South Fork Silver Creek.

Macroinvertebrate Monitoring

A number of sites have been monitored on the forest for macroinvertebrates only. Eleven sites are part of a cumulative watershed effects research study being carried out by Colorado State University under Dr. Lee MacDonald, in conjunction with hundreds of silt fences that are measuring off-site sediment transport rates from roads, areas burned by wildfires, areas of timber harvest and other land management activities.

A study to determine the effects of suction dredge mining on instream habitats on 7 reaches within 5 watersheds that have relatively high levels of suction dredging (North State Resources 2002). Two watersheds have sampling conducted on a relatively undisturbed reach, as well as a reach located below evidence of suction dredging. The results from the paired studies indicate that the undisturbed reaches are providing optimal macroinvertebrate habitat in the NF Cosumnes and Camp Creek Watersheds, while the disturbed reaches were both rated as sub-optimal. Two reaches are also identified as optimal for macroinvertebrate habitat in Big Canyon Creek and Dogtown Creek. The Steely Fork Cosumnes reach is also rated as sub-optimal. Reaches rated as sub-optimal or marginal were based on the amount of sediment deposition, bank stability issues, and decreases in riparian zone width, and changes in embeddedness. Evidence of degraded habitat conditions are evidenced by fewer invertebrate taxa and lower invertebrate abundance and richness. However no statistical assessment of significance between sites was completed. This study was set up to provide baseline conditions for future investigations.

Temperature Data

Since 1997 the fishery department has collected files of temperature data using electronic temperature loggers (Onset Stowaway) at various sites on streams and in ponds (or waterholes) throughout the Forest. Most of these records are for summer and fall water temperatures and at a minimum, readings are taken every hour. Much of the temperature data collection has focused on SCI streams. Data is currently stored in a BoxCarPro program that is easily converted to an Excel data. Data is summarized for daily temperatures, 7-day average maximums and monthly maximums. The data may be used in watershed analysis, biological assessments, and stream survey reports and may be correlated with vegetation and shade data. Temperature data were collected in 2002 on Big Silver Creek, Jones Fork Silver Creek, North Fork Cosumnes River (upstream of the gauging station and upstream of Capps Crossing), Camp Creek (above the Diversion Tunnel, at Pilliken crossing, above the old gaging station), a tributary to Upper Cole Creek, and a tributary to Lower Cole Creek. In 2001 temperature data was collected on Upper and Lower Rock Creek, Jones Fork Silver Creek, Middle Fork Cosumnes River, three sections along Camp Creek, Sopiago Creek, North Fork Weber Creek, and Dufrene and Spivey Ponds.

ENF Stream Condition Inventory (SCI) Surveys

Numerous monitoring sites have been set up in designated stream reaches across the forest. At these monitoring points, many of the SCI attributes are measured such as cross-sections, width to depth ratios, gradient, and pebble counts.

A number of the locations have partial SCIs including Big Silver Creek, Fry Creek, Jaybird Canyon Creek, Jones Fork Silver Creek, Rock Creek, Round Tent Canyon, South Fork Long Canyon Creek, South Fork Rubicon River, and Wench Creek. The monitoring objectives for these sites include assessing changes from recreation, timber management, and/or fire and post-wild fire management effects. Many of these sites have been sampled more than once and comparisons are being made to determine the long-term trends.

Recently two stream reaches have been designated for monitoring within the Star Fire burn area on the Georgetown Ranger District. The reaches are located on Chipmunk Creek and North Fork (NF) Long Canyon Creek. Data has been collected for 2001 and 2002 on Chipmunk and 2001 for NF Long Canyon Creek that includes cross-sections, gradient, width to depth ratios, and pebble counts. Cross sections and pebble counts are used to document any changes in channel width and substrate size. The data collected for these environmental variables is expected to detect effects from the wildfire as well as post-fire management activities.

In addition, surveys were conducted in 2002 for grazing allotment planning that included partial SCIs along with collection of other data. Sampling locations were located in Deer Valley, Ladeaux Meadow, Long Valley, Martell Flat, Onion Valley, Plasses Meadow, and Willow Flat.

Volunteer Monitoring Efforts

In 1993 volunteer stream monitoring began with data collection by Oakridge High School students within streams burned by the Cleveland Wildfire. While objectives were developed and utilization of standard protocols was planned, much of this data was either unusable or lost. Learning from this experience, the forest developed a new process of training and overseeing volunteer monitoring projects. A day of SCI protocol training and field equipment calibration has been offered to teachers interested in utilizing students in volunteer monitoring efforts. Many of the teachers are seeking other outside formal training classes in aquatic bioassessment and stream health monitoring. As a result of these efforts a very successful volunteer monitoring program has developed using hundreds of volunteers from many different schools to collect instream monitoring data.

American River College began monitoring Fry Creek within the Cleveland Fire in 1995 and continued through 1997 while also monitoring two other streams on the forest: Jaybird Canyon and Round Tent Canyon in 1996 and 1997.

In 1998, the Watershed Education Summit was put together that included volunteer monitoring with students from four local high schools (El Dorado, Oakridge, Union Mine, and Golden Sierra High Schools). This effort has been in place annually ever since. The classes have visited three streams: Jones Fork Silver Creek, South Fork Rubicon River, and Wench Creek. Each year they learn about monitoring techniques, use of monitoring equipment, the importance of quality control in data collection, and preliminary data analysis.

Watershed Education Summit (WES) volunteers collect data using the partial SCI protocol. They learn about stream dynamics through the collection of channel cross sections, pebble counts, photo points, discharge measurements, macro invertebrates, vegetation surveys, and water quality. In addition the sites are mapped and GPS coordinates recorded for these permanent monitoring reaches. Students work alongside Forest fishery biologists and hydrologists in conjunction with personnel from Eldorado County Resource Conservation District, Department of State Water Resources, and other local agencies to collect data. Each year previously analyzed datasets are shared with the students to help to evaluate the changes as well as to provide a guide for quality control of the data being collected.

In 1999 Cosumnes River College began monitoring streams within the Big Silver Watershed using SCI attributes and has continued this effort annually.

Other volunteer monitoring is conducted with Gold Trail School's 6th graders. Gold Trail School began collecting partial SCI data on South Fork Long Canyon Creek in 1999 and 2000 as well as in Rock Creek in 2001 and 2003.

GEOMORPHOLOGY AND GEOLOGY

Landslides

With the number of landslides occurring during and subsequent to the two major rain-on-snow storms in December and April of FY 06, there was increased mass-movement/landslide activity on the Forest that required evaluation and monitoring for road safety closures as well as recommendations for repair and monitoring to provide public safety to re-open roads. Because the Eldorado employs one of only three licensed geologists in R5, assistance was provided to other Forests in California as well as coordination with state and county transportation departments.

Hazardous Abandoned Mine Sites

The Eldorado National Forest lies in the heartlands of the California Gold Rush of 1849 occurred, with the gold discovery site at Sutter's Mill in Coloma only a few miles west of the Forest Boundary. Mining by various methods occurred on the Forest, concentrated in the lower elevations. The inverted topography found in the western half of the Forest protected gold-bearing Tertiary gravels that were extensively prospected from the gold rush of '49 until the pre-World War II era, when the price of gold dropped and mining on a small scale became economically infeasible.

There are a number of abandoned mine sites on the Forest, with perhaps the largest concentration occurring on the Georgetown Ranger District. These abandoned mine features (horizontal adits, vertical shafts, steeply sloping stopes, and open pits) pose a health and safety threat to the general public, wildland firefighters, Forest employees, and wildlife. Horizontal openings could collapse or may lack life-sustaining air. Shaft openings and stopes present a risk from falling into the vertical and near-vertical openings for people, livestock, and wildlife. The potential hazard from abandoned mine sites is increasing as recreation increases on the Eldorado National Forest. Public safety while visiting the Forest was increased by the evaluation and closure of several hazardous abandoned mine shafts, adits, and stopes in the Otter Creek watershed of the Georgetown District. Follow-up evaluation and monitoring of these closures is providing methods for successful treatments for another 30 or so hazardous abandoned mine sites across the Forest.

LiDAR

LiDAR is a relatively new laser technology for remote sensing of vegetation, stream profiles, and landform. Because LiDAR is able to capture data at different levels, it is able to record the shape of the land to provide data for analysis of geomorphology. Two LiDAR pilot projects were initiated on the Forest in FY 2006. One set of LiDAR data was collected for the Otter Creek watershed for evaluation of its use to locate abandoned mine features. Evaluation of this use is continuing, however, preliminary analysis indicates that most abandoned mine features are too small to be evident. The second pilot application for LiDAR data was flown over the Indian Valley area to locate and evaluate geomorphic features, including alluvial fans, terraces, and stream sinuosity.

The use of LiDAR for locating both old, inactive landslide features and active landslides is extremely promising. The next proposed application is to evaluate and monitor landslides in the South Fork American River canyon, which contains the heavily traveled US 50 corridor, and has a history of major landslides resulting in long-term road closures of the highway.

WILDLIFE MONITORING – CALIFORNIA SPOTTED OWL

In addition to ongoing wildlife monitoring required for Forest projects, two more intensive monitoring efforts were conducted for California spotted owls. A study to reduce the uncertainty surrounding effects of changes in canopy cover was initiated with Pacific Southwest Research Station and the Tahoe National Forest. The Eldorado also prepared an analysis of changes in owl habitat suitability from 1990 through 2001 from periodic vegetation inventory updates.

CA Spotted Owl Canopy Cover Study

The Sierra Nevada Forest Plan Amendment (SNFPA) (USDA Forest Service 2004) sets forth a strategy for vegetation management to reduce the risk of wildfire to communities and change wildfire behavior on the landscape. Management prescriptions include thinning forests surrounding communities and strategically placing fuel treatments throughout the landscape. Implementation of the SNFPA direction will modify habitat within and around spotted owl sites. The SNFPA acknowledges there is a risk to spotted owls, and some other species, associated with the proposed strategies, however there is uncertainty regarding the magnitude of the effect on spotted owls. In addition, it is unclear how these strategies could be modified to reduce the risk to these species. This project is designed to address the following key management question:

“How do individuals and/or pairs of California spotted owls respond to reductions in canopy cover over some portion of their home range core area (HRCA)? Mechanical thinning of forests to reduce fuels hazards will address some ladder fuels and crown fuels in order to reduce the fuels condition class to acceptable conditions. This will reduce the number of trees by some amount (depending on pre-treatment stand conditions) with no trees greater than or equal to 30 inches removed and will reduce crown closure by as much as 30% and down to as low as 40% average within a stand”.

The SNFPA also notes the uncertainty regarding how spotted owls respond to mechanical treatments within protected activity centers (PACs) and Home Range Core Areas (HRCAs). This adaptive management study project proposes to monitor the effects of canopy cover reduction within HRCAs following the general guidelines in SNFPA. As described in the study proposal, “Spotted owls can respond to canopy reduction treatments in an acute (immediate) manner by moving away from the treatments, changing the size and shape of their home range, abandoning their territory, and/or stop using the treatment area. They can respond in a chronic manner by having lower survival or reproduction than either they had before the treatment, relative to other owls. Thus, the research will monitor both acute (this proposal) and chronic (long-term) owl responses to canopy cover reduction.” (Gutierrez 2005)

The study area is located on the Georgetown, Pacific, and Placerville Ranger Districts of the Eldorado National Forest, and the American River Ranger District of the Tahoe National Forest. The study area occurs within the regional study area of the California Spotted Owl Demographic Study in the central Sierra Nevada (Franklin et. al. 2004). Twelve spotted owl territories were randomly selected for the study, of which six territories would serve as “treatment” territories, and six as “control” territories where no treatments would occur. Four of the six “treatment” territories occur within the Eldorado National Forest. Radio telemetry will be used to monitor owl responses to treatments. The birds were be marked with radio telemetry during the spring, 2006, and will be monitored throughout the summer months to identify foraging use areas prior to fuels treatment activities. Mechanical thinning occurred in summer and fall of 2006. The birds will continue to be monitored during and after treatment (the transmitter battery life is reliable for at least one year). The potential owl response to treatments would include the owl behavioral

response to treatment (avoidance or attraction to treatment), change in home range shape, change in home range size, and intensity of use of treatment or alternative areas, and mortality. Specific information can be found in the study proposal, (Gutierrez 2005).

CA Spotted Owl Habitat Capability Analysis

Eldorado National Forest Land and Resource Management Plan (LRMP) Monitoring Requirements specify monitoring of population and habitat trends for the California spotted owl. Population trends continue to be monitored through a long-term demographic study occurring on the Eldorado National Forest and at two additional Sierra Nevada study sites. The latest meta-analysis (presented in Franklin et al. 2004) indicated a stable or increasing population on the Eldorado study area, although substantial uncertainty remained regarding this estimate.

The LRMP requires habitat monitoring to “map habitat changes (vegetation) to establish change in habitat capability.” Habitat monitoring has been conducted forest-wide, and specific to the spotted owl land allocations established by the Sierra Nevada Forest Plan Amendment (SNFPA). The monitoring requirements indicate further action is needed when 1) there is a reduction in habitat capability for spotted owls within spotted owl habitat areas (SOHAs, which have been replaced by Protected Activity Centers, [PACs], by the SNFPA) and 2) when there is “any deviation from Standards and Guidelines established for spotted owl management areas.” In addition to PACs, the SNFPA established home range core areas (HRCAs) for CA spotted owls with objectives for management. These elements are evaluated in this report.

Forest-wide Analysis of Habitat Capability

In 2006 the Regional Office prepared an analysis comparing forest-wide vegetation inventory data from the forest’s 1991 and 1997 vegetation inventories. Habitat suitability was established using the California Habitat Relationships System. Vegetation inventory data used for the assessment is provided by the Pacific Southwest Region’s Remote Sensing Lab, which also provides a description and accuracy assessment for the data. It should also be noted, however, that an unknown amount of “noise” exists in this data due to changes in refinement of imagery and interpretation between the first and second datasets. The data presented in table 2 indicates a loss of 12 percent (46,554 acres) in total suitable spotted owl habitat and a 36 percent (29,440 acres) reduction in high suitability habitat (habitat suitable for nesting or roosting). It appears that most of the decrease in high suitability habitat reflects a change from high suitability to moderate suitability habitat (habitat suitable for foraging). Some of the total habitat loss reflects the effects of the 1992 Cleveland Wildfire. Changes from high to moderate suitability habitat is likely to also have resulted from the effects of understory thinning treatments that have occurred within this timeframe.

Table 2. Spotted owl suitable habitat trend from 1991 to 1997 on National Forest System (NFS) lands on the Eldorado National Forest.

Forest	Acres of High (H), Moderate (M) Suitability, and Total (H+M) Habitat								
	1991			1997			Habitat Trend (difference)		
	H	M	Total	H	M	Total	H	M	Total
Eldorado	80,704	319,406	400,110	51,264	302,292	353,556	-29,440	-17,114	-46,554

Monitoring Results for Spotted Owl Management Requirements for PACs

The SNFPA allowed for mechanical treatments to occur in less than 10 percent of the acreage in spotted owl PACs, per decade on the bioregional scale that includes the eleven National Forests in the Sierra Nevada bioregion. There are a total of 64,544 acres in PACs on the Eldorado National Forest. Approximately 614 acres received mechanical treatments between 2001 and 2005, or about 1 percent (Table 3). This remains far below the Standard and Guideline allowing 10 percent of PAC acreage to be treated per decade (Sierra Nevada wide).

Table 3. Treatments within PACs between 2001 and 2005.

Fiscal Year	#CASPO PACs treated	Acres Treated
2001	5	109
2002	5	162
2003	3	41
2004	5	225
2005	2	55
Total	20	614

Monitoring Results for Spotted Owl Management Requirements for HRCAs

The Supplemental FEIS for the Sierra Nevada Forest Plan Amendment (SNFPA) assumed that 80% of the acres within HRCAs would remain untreated under the selected alternative (FSEIS, pg. pg. 266).

A sample of three recent project Biological Evaluations (BE's) were reviewed to determine if this assumption is accurate for fuels treatments that are occurring on the ENF. In two of the three projects reviewed, project treatments within HRCAs exceeded 20% of the HRCA (Table 4). Treatments planned within the Goldfingers and Prospect Rock projects include a substantial proportion of the habitat for individual spotted owl HRCA sites. About 40 percent of the suitable nesting HRCA habitat treated in the project area is projected to be reduced from high capability (suitable for nesting) to moderate capability (suitable for foraging) (Table 4). These projects treatments contribute to cumulative effects to about half of the available spotted owl habitat in the area analyzed for cumulative effects for these projects.

Table 4. Project level analysis of effects to spotted owl habitat.

Project Name	Number of HRCAs treated	% HRCA acres treated by project	Of the habitat acres treated, % shifted from nesting quality to foraging quality	% spotted owl suitable habitat cumulatively affected by past, present, and reasonably foreseeable projects in the analysis area
Prospect Rock	5	2% - 16%	38%	48%
Goldfingers	9	2% - 29%	41%	56%
Jane Doe	5	1% -32%	ND	ND

Table 5 illustrates the subsequent analysis of vegetation treatments that have occurred (or are currently under contract and were entered into FACTs as of May 2006), which identified that 24

of 203 HRCAs (12%) have received vegetation treatments that exceed 20% of the HRCA. Of these, 11 have received commercial harvest treatments within more than 20 percent of the HRCA.

Table 5. HRCA's with commercial harvest treatments exceeding 20% of the HRCA acreage.

HRCA	% Treated
AM009	24.12
AM007	40.76 (Power Fire)
ED007	21.51
ED041	29.00
ED050	37.92
ED052	32.76
ED063	26.34
ED098	23.63
ED115	26.50
ED162	23.69
ED208	23.69
PC013	20.84

Desired Conditions: Project monitoring data describing whether desired conditions within HRCAs have been achieved by vegetation treatment projects is currently unavailable.

SENSITIVE PLANTS

Sensitive Plant Individual Species

The Eldorado National Forest conducts an active sensitive plant monitoring program to provide information on known population locations and provide input for project planning to prevent negative impacts to sensitive plants. Sites of sensitive plants are flagged by a botanist prior to activities occurring, and monitored after activities are completed. In addition, a number of sensitive plant populations are monitored for population status and persistence. From 2004 through 2006 these sites included:

- Calochortus Clavatus var. avius – 15 sites in 2005, 11 sites in 2006
- Navarretia prolifera ssp lutea – 56 sites in 2005 and 2006
- Senecio layneae – 2 sites in 2004, 2005, 2006
- Viola tormentosa – Wench Creek site in 2005
- Draba asterophora var. macrocarpa – 2 sites in 2004, joint monitoring with LTBMU botanists

Fen Monitoring and Surveys

The SNFPA identified fens as a special aquatic feature, with direction that they be managed to protect their unique features. The Botany and Range specialists discovered areas suspected to be fens during the evaluation of existing conditions for the Pardoe allotment in 3 of the grazing units. Following this discovery, the Forest has conducted inventory/monitoring across the Forest to identify fens and monitor effects from management activities, including grazing, vegetation manipulation, and recreation use.

Dr Cooper from Colorado State contracted with the Region in 2004 to inventory/sample for fens in the Sierra Nevada Forests. Approximately 10-12 fens were found on the Pacific District of the ENF that year. Current surveys were funded out of the RO, for about 6 forests that requested funding to accomplish fen monitoring in 2006. An estimate is that the ENF has surveyed about 50% of the potential habitat, mainly wet meadows above 6000 ft. ENF botanists are refining their aerial photo skills for discerning fen-like areas on photos for pre-field analysis.

During the 2006 field season, an estimated 222 acres of meadow habitat was surveyed for fens and sensitive species associated with mesic habitat on the Eldorado NF. 139 acres of meadows were surveyed on the Placerville district, 50.6 acres on the Pacific District, 26.3 acres on the Amador District, and 5.8 acres on Georgetown District. Potential sites were selected based on information gathered from aerial photos and topographic maps, as well as personal recommendations from Forest Service employees familiar with the Eldorado NF. Of the 24 meadow complexes visited in 2006, 8 new fens were located (a 33 % success rate) with a combined area of 2.5 acres. Of the eight new fens, five were on the Pacific district and three were on the Placerville district. Five of these new fens are also located within the Cody/Sherman grazing allotment.

One new occurrence of *Bruchia bolanderi* was discovered during the 2006 field season at Telefen, which is a first for the Forest and Eldorado County.

Table 6. Sites visited during the 2006 fen survey. Bold indicates newly discovered fens.

Name	Location	District	Date of visit	Notes
Jane Doe Fen	Kyburz quad: north of the Tie road, North of Wilson Ranch	Pacific	7/12/06	Sloping fen in Misnomer, near road and just north of unit
Blue Camas meadow	Kyburz quad: north of the Tie road, North of Wilson Ranch	Pacific	7/12/06	First meadow sampled (ph meter fiasco)
Four corner fen/ meadow	Kyburz quad: south of the Tie road, east of Ice House Reservoir	Pacific	7/12/06	Lots of Drossera, but no peat formation
Meadow with dense sphagnum	Kyburz quad: south of the Tie road, east of Ice House Reservoir	Pacific	7/12/06	Near four corner "meadow"
Round fen	Kyburz quad: north of the Tie road, West of Table Rock	Pacific	7/12/06	Basin Fen in Roundabout
Yellow eye grass meadow	Riverton quad: south of Union Valley Reservoir	Pacific	7/17/06	Erington suggested we look at wet meadow
Shaw Flat	Tragedy Springs quad	Placerville	7/19/06	
Allen's flat	Tragedy Springs quad: east of intersection between Iron mountain Rd and highway 88	Placerville	7/19/06	small spring fed pond (fed drainage off of slope) just mucky wetland. No peat
Singleton spring	Tragedy Springs quad: Off of Iron Mountain Rd	Placerville	7/19/06	some peat but not deep enough for fen
Cody Meadow (3 separate fens)	Tragedy Springs quad: North East corner of Quad	Placerville	7/20/06	Three springs within large open meadow with peat
Wet meadows on Olearie cow	Loon Lake quad	Pacific	7/25/06	Up by loon lake (near angel creek)
Girlie Meadow	Robs Peak Quad: By Girlie reservoir	Pacific	7/25/06	surveyed for Oleary's cow
Pyramid View	Pyramid Peak quad: due north of Cody lake boy scout camp	Placerville	8/2/06	Fen in meadow complex south of cody lake. Surveyed the entire meadow complex. Only one fen located

Wild Cat Meadow	Robbs Peak; off of Rd 21, north of Leonardi Falls Botanical area.	Georgetown	8/8/06	Wet meadow along creek
Middle Meadow	Bunker Hill Quad; west of Hell hole Reservoir	Georgetown	8/8/06	Wet seep with a lot of alders.
South of pearl lake	Lonn Lake quad; south of the private property near Pearl Lake	Pacific	8/16/06	Dry meadow with seasonal channel
Just south of granite cap at pearl lake	Loon lake Quad	Pacific	8/25/06	Peat formation less then 40 cm
Tell's Bog	Loon lake quad: off of Cheese dip road	Pacific	8/10/06	Clear cut upslope of wet meadow with Drossera
Silver Fork Meadow	Tragedy Springs quad: near Caples Creek	Placerville	8/29/06	Too Dry for a Fen
Jake Scheider Meadow	Tragedy Springs quad: near Caples Creek	Placerville	8/29/06	
Jim Quinn	Tragedy Springs quad: Near Iron Mountain Rd off of silver Fork Rd.	Placerville	8/19/06	
Tele-fen	Caples Lake Quad; west of Sneider Camp	Placerville	8/23/06	Has Bruchia bolanderi
Vernal View fen	Loon Lake quad: North of Pearl lake near vernal pool.	Pacific	8/25/06	

Table 7. Fens Found during 2006.

STUDY DATE	NAME	ELEV (FT)	SLOPE (DEG)	ASPECT	Peat Depth (cm)	Fen Area (ft sq)
07/12/06	Jane Doe fen	6,680	0.10	270	40	31,926
07/12/06	Ring Fen	5,800	0.10	270	40	67,823
07/19/06	Cody_meadow_3	7,720	0.10	360	40	100
07/19/06	Cody_meadow_1	7,640	0.10	340	40	240
07/19/06	Cody_meadow_2	7,640	0.10	270	40	300
08/02/06	Pyramid view	7,520	0.10	315	40	451
08/25/06	Vernal view	7,600	0.00	0	40	2,917
08/26/06	Tele-fen	8,060	0.10	360	40	6,700

Two potential fen sites currently remain for future surveys: The south side of Leeks Spring and East of Tele-fen

RANGE

Utilization and stream bank disturbance monitoring for the 2006 grazing season to determine compliance with the Forest Plan standards was accomplished for six of the nine active allotments on the Eldorado National Forest. The allotments monitored were: Cody Meadows, Bear River, Morrison, Sopiago, Corral Flat, and Chipmunk. Pardoe and Sherman allotments took non-use for resource protection, due to very late snowmelt that delayed range readiness past the first of August. Old Pino was evaluated for range-readiness, but was not monitored for utilization this year.

Eldorado grazing allotments are under season-long management systems. The SNFPA allows 40% maximum utilization under season-long grazing systems, 20% stream bank disturbance and 20% willow browsing. For allotments that have not yet been updated for the 2004 SNFPA, the Eldorado LRMP sets a maximum utilization of 50%, and requires that riparian areas, including streambanks and willows, be maintained in a healthy rangeland condition.

Most utilization monitoring used the clip and weigh method, with stubble height monitoring used only on remote units of Chipmunk allotment. The results indicate that utilization ranged from 4

% to 83%, with a median of 45% and an average of 53%. Stream bank disturbance appears to be largely commensurate with utilization; units with higher utilization usually also had higher levels of stream bank disturbance, while those with lower utilization had lower levels of stream bank disturbance. Where grazing utilization was measured in the 40% range, stream bank disturbance was mostly around 20% disturbance, with some exceptions, likely from a long history of grazing and recreation uses in some areas. Stream bank disturbances for measured stream reaches ranged from zero to 100%, with a median between 25-30%, and an average of 38%. Willow browsing appears to correlate to utilization and stream bank disturbance in some instances, with the highest willow browsing (75%) occurring in a unit with 92% stream bank disturbance and 79% utilization. However, willow browse measured 6% in a unit with 12% utilization and 58% stream bank disturbance. Willow is not present in all allotments or units, for the 2006 season, the three measurements taken for willow browse were 6%, 27% and 75%. This small sample size precludes a statistical or trend analysis. Willow browsing also appears to be related to the late seasonal decrease in palatability of herbaceous forage combined with an increase in palatability of willow after frost occurs.

FIRE PREVENTION

Eldorado National Forest participation in the California State Fair at “Camp Smokey” is a commitment well worth the effort to be of service to the public. The California State Fair draws approximately 1.5 million visitors each year, and one component within it is called “Camp Smokey”. Camp Smokey is an Interagency Fire Prevention Education program that consists of 7 educational stations where the visitors, which are mostly children, go through to learn about fire prevention, fire effects, and the use of fire in ecosystem management. The mission of Camp Smokey is to provide education on fire in a friendly and fun atmosphere that visitors will find easy to remember. If a life is saved by the education received at Camp Smokey, the program is a success.

The Eldorado National Forest has had a huge involvement in Camp Smokey over the past 8 years. The Forest’s Fire Prevention Officer is the coordinator of this huge event and is also the regional Forest Service representative to the State Fair. The Eldorado engine crews and other prevention personnel have also been involved with the staffing and preparation of this huge public event over the years. This event takes approximately 1-2 months to prepare for and lasts 21 days. We are always looking for volunteers to help with the program, and personnel from other Forests, the Regional Office, National Park Service, California Department of Forestry, and local city Fire Departments have actively participated to staff the teaching stations.

The success of “Camp Smokey” is best illustrated by the enthusiasm of the children, and by the fact that parents remark that their children anticipate “Camp Smokey” as one of their favorite events each year at the State Fair.

RECREATION

The Eldorado National Forest is a well-loved destination for recreational activities, and people visit the Forest for a variety of recreation experiences. An illustration of the popularity of the Eldorado is that most campgrounds are on a reservation system, and monitoring showed that the Silver Lake campground on Amador District only had one campsite left un-reserved for the Fourth of July weekend by April 15th.

Through an active monitoring program, and use of that monitoring to improve recreation experiences, the Eldorado National Forest and the Lake Tahoe Basin Management Unit jointly received the **Aldo Leopold Award for Overall Wilderness Stewardship Program** for 2006 in recognition of their outstanding management of Desolation Wilderness. The objective of this

award is to recognize excellence in overall wilderness stewardship programs. The criteria used to select the recipient of this prestigious award, and the implementation of those criteria in the management of Desolation Wilderness are detailed below:

1. Effectiveness in stewardship to protect and improve wilderness character. Decisions reflect analysis based on wilderness values.

Desolation's managers long ago made a commitment to preserve and enhance the natural character of this wilderness. Despite its enormous popularity, Desolation stands out as a proud example of an enduring wilderness resource where wilderness values are not compromised, and all management decisions affecting Desolation aggressively seek to preserve this wilderness for present and future generations of users. Two Forests (Eldorado & Lake Tahoe Basin Management Unit), manage Desolation Wilderness, and managers have developed and implemented comprehensive Management Guidelines (Desolation Wilderness Management Guidelines FEIS, 1998). The multi-disciplinary approach provides the stewardship direction that preserves wilderness character while protecting the wilderness setting. This has been accomplished by using the minimum tools necessary with the emphasis for management on preservation and restoration of Desolation's unique scenic qualities and primitive conditions. Projects and programs within Desolation reflect ongoing stewardship efforts that respond to monitoring findings.

Multiple restoration projects, which have reduced impacts associated with heavy camping use and restored the scenic quality within popular lake basins (Lake of the Woods, Grouse Lake, Hemlock Lake, Tamarack Lake, and Eagle Lake). Ongoing campsite condition monitoring identifies future restoration needs and is designed to identify priority areas for treatment.

Extensive wilderness education programs, expanded field presence, ongoing trail maintenance, and improved trailhead signing have been possible through the Fee Enhancement program (REA).

The importance of wilderness stewardship is emphasized by the importance placed on visitor contacts made at three critical points: 1) the front offices/visitor centers (three offices staffed with visitor information specialists that issue Wilderness permits and provide information), 2) trailheads (trailhead naturalist program), and 3) within the Wilderness (Wilderness Rangers).

The Desolation Wilderness Volunteer Program (1000+ hours of contributed time in 2005) enhances community involvement in management of wilderness and provides more presence in the field with the focus of Wilderness education (Wilderness awareness, "Leave No Trace" ethics, etc.)

An aggressive user management program with mandatory permit system, zone quotas, group-size limits, campfire restrictions et al. were designed to preserve the visitors' wilderness experience and protect the wilderness resource in one of the most heavily visited Wilderness Areas in the nation.

2. Wilderness planning, baseline data, and monitoring are in place or ongoing and reflect that wilderness is a full partner in the multiple-use mission.

Comprehensive Management Guidelines are complete and routinely monitored for compliance. The guidelines are being applied with an on-going program to both encourage and monitor multiple resource projects that preserve the wilderness resource.

Multi-resource monitoring routinely occurs within Desolation. Examples of on-going multi-resource monitoring taking place within the Wilderness include monitoring for white-pine blister rust, water-quality monitoring, fur-bearer studies, fish population studies, amphibian surveys (including mountain yellow-legged frog), and archeological evaluations. In recent years, there

have been acid-rain deposition studies, noise, and air quality monitoring evaluations within Desolation Wilderness.

3. Public involvement and education in wilderness stewardship are active.

The Desolation Wilderness Volunteer program, a “front country” ranger program, and the “Desolation Wilderness Education Tour” (a new education program implemented in 2005 at local events, outdoor stores, etc.) actively engage both the local and regional community to expand wilderness awareness, user skills, and solicit support for wilderness values and opportunities.

Through local media (radio, newspapers, magazine articles, internal e-mails to forest personnel), managers work to foster greater understanding and support for wilderness. Outreach efforts are regularly monitored for effectiveness.

4. Research needs are identified and information is being gathered and applied.

Multiple research projects have taken place within Desolation, including numerous studies (e.g. “Wilderness trends” –Cole/Watson, “Recreation Fees in the Context of Wilderness Values” – Trainor/Norgaard, “User Perceptions of Wilderness Crowding Studies” – Chilman et al). Ongoing campsite condition inventories and an encounter monitoring program are being conducted in cooperation with California State University Sacramento. The information gathered is reviewed by the wilderness staff and incorporated into the annual program. Additional co-op research is being conducted within Desolation by local, state, and federal resource agencies.

5. Field presence is apparent and effective.

Fully trained uniformed staff is present throughout field season, and wilderness rangers routinely patrol all areas inside Desolation. These patrols are supplemented by “front country” wilderness staff funded through REA and by “uniformed” volunteer staff. Forest interpretive staff supplies added support. Most of the baseline workforce is funded thru NFRW. Managers routinely monitor comments and field reports to evaluate the effectiveness of the field program and make adjustments to ensure that the field presence is effective in obtaining user compliance and achieving education goals.

6. Where fire is a key component of the ecosystem, fire planning and implementation are a priority.

A Wilderness Fire Use plan that specifically addresses Desolation has been completed consistent with Forest Plan direction, providing the needed guidance for the achievement of resource management objectives through the use of naturally ignited fire when deemed appropriate to function in its natural ecological role. By actively working with other resource and fire managers, Fire Use was successfully implemented for three lightning-caused fires in 2005.

7. Proactive in accomplishing the 10-Year Wilderness Stewardship Challenge.

Desolation has consistently been managed to exceed the 10-Year Stewardship Challenge as managers have strived to exceed all established standards to ensure that wilderness resource management conditions, goals and objectives are being maintained.

For many years, there has been an aggressive management program for this wilderness to preserve its natural character in spite of the fact that (acre per acre), it is one of the most heavily used wilderness areas in the nation! Accordingly, Desolation is also one of “the most” heavily regulated wilderness areas in the nation, with a multitude of restrictions, regulations, and permitting requirements. Along with an active education program, management for the preservation of wilderness character is recognized as critical to the Forests’ success both in caring for the land and providing service to the public.