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Rogue River - Siskiyou National Forest

Land and Resource Management Plan

MONITORING AND EVALUATION REPORT

Fiscal Year 2006

***Status of implementation activities
associated with the Biscuit Fire Recovery
Project***

***Report on 2006 Inventory and
Monitoring Projects***

ROGUE RIVER-SISKIYOU NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

MONITORING AND EVALUATION REPORT For Fiscal Year 2006

INTRODUCTION

Background

The Rogue River National Forest Land and Resource Management Plan (LRMP or Forest Plan) became effective in July of 1990. The Forest Plan for the Siskiyou National Forest became effective in March of 1989.

These Forest Plans provide direction for integrated management of the resources of each National Forest. Forest Plans are implemented through projects designed to be consistent with their direction and land allocations. Monitoring is an integral part of the Forest Plan. Projects and programs are monitored for consistency with the plan and to test the validity of the plan itself. There is provision for amendment of the Forest Plan where monitoring shows a need for change or when changes in laws and regulations occur.

On April 13, 1994, the Record of Decision for *Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* was signed by the Secretary of Agriculture, Mike Espy and the Secretary of the Interior, Bruce Babbitt. This Record of Decision (ROD) amended the Rogue River and Siskiyou National Forest Land and Resource Management Plans and provided new direction for management of the natural resources of the Forests.

This ecosystem plan, also known as the Northwest Forest Plan, is significant because it provided a watershed-based approach to management of Federal lands within the range of the northern spotted owl. The future management of late-successional and old-growth forests, recovery of the northern spotted owl and an Aquatic Conservation Strategy to restore aquatic ecosystems are central parts of this Plan. Whenever the term "Forest Plan" is mentioned in this document, it refers to the Rogue River and/or Siskiyou National Forest Land and Resource Management Plans as amended by the April 13, 1994, Record of Decision.

In December 2003, the Forest Service Washington Office approved administrative consolidation of the Rogue River and Siskiyou National Forests. Reference is made throughout this Monitoring Report to the Rogue River-Siskiyou National Forest (RR-SNF) as applicable. When reference is made to the 1990 Forest Plan or land management direction applicable to the Rogue River National Forest, the phrase Rogue River National Forest (RRNF) continues to be utilized. When reference is made to the 1989 Forest Plan or land management direction applicable to the Siskiyou National Forest, the phrase Siskiyou National Forest (SNF) continues to be utilized.

The Rogue River-Siskiyou National Forest works under a consolidation of the two respective Forests. This includes operation under a single Forest Supervisor, a Deputy Forest Supervisor, and a single set of Staff Officers for overall management of both National Forests. In concert with this organizational mode, this Monitoring and Evaluation Report has been organized and is reported under a joint Forest assumption.

Throughout this report, reference is made to certain organizational units of the Forest as Ranger Districts. Reference is made to the Powers Ranger District, the Gold Beach Ranger District (former Chetco and Gold Beach Ranger Districts), the Wild Rivers Ranger District (former Illinois Valley and Galice Ranger Districts), the High Cascades Ranger District (former Prospect and Butte Falls Ranger Districts), and the Siskiyou Mountains Ranger District (former Applegate and Ashland Ranger Districts).



Monitoring reports track implementation of the Forest Plans. This report documents selected monitoring efforts and evaluation of Forest Plan implementation during fiscal year (FY) 2006 (10/1/05 to 9/30/06). This report generally covers Forest Plan monitoring elements and is a summary of selected Forest reports and monitoring efforts. Included in this years report is a summary of the status of implementation activities associated with the Biscuit Fire Recovery Project, through June 2007. It is not a report of all of the programs or program accomplishments on the Forest.

Forest Plan monitoring is an ongoing process. The Rogue River-Siskiyou National Forest is continuously monitoring and evaluating new information and changing conditions. Monitoring activities and results have been summarized in annual monitoring reports for several years; this report is the latest of several Forest Plan Monitoring and Evaluation Reports previously prepared for each National Forest. These documents are available to the public upon request.

Forest Plan Monitoring Strategies

The Monitoring Strategy for the **Rogue River National Forest (RRNF)** became effective in 1990 with the signing of the Forest Plan. Chapter 5 of the RRNF Forest Plan contains a summary of the Monitoring and Evaluation of Forest Plan implementation. The monitoring strategy was based on that summary and on the detailed monitoring worksheets contained in the Planning Record. Beginning in May 1995, the Rogue River National Forest began working on an update to the previous strategy. An update was needed to bring the Forest Plan closer to the current situation of forest management under the Northwest Forest Plan and the monitoring goals of this plan and the goals of the Ecosystem Monitoring Framework¹. Since these monitoring processes are still in their developmental and baseline information gathering stage, an update to the Forest Plan monitoring strategy was needed to “fill in the Gap” between the old plan and the new plans under development.

The Rogue River National Forest Monitoring Strategy Update is a distillation and improvement of the key components of the 1990 Strategy. The Strategy defines the items to be monitored and contains the Forest goals, outputs and desired future conditions, key monitoring questions, units of measure, frequency, proposed monitoring methods, standards, and assigned responsibilities.

The Monitoring Strategy Update was completed in January 1997, and is available as a separate document from the Forest Supervisor’s Office. Monitoring and Evaluation Reports for the Rogue River National Forest have been based on this Monitoring Strategy Update since 1997.

The Monitoring Strategy for the **Siskiyou National Forest (SNF)** first became effective in 1989 with the signing of the Forest Plan. Chapter 5 of the SNF Forest Plan contains a summary and table for the components of the Monitoring and Evaluation program. The Monitoring and Evaluation Program for the SNF has been guided by that document since 1989 and several annual reports have been prepared and are available upon request.

¹ The Ecosystem Monitoring Framework is a concept originating on the RRNF in 1993. It was documented in an Ecosystem Monitoring Handbook, Version 1.3. This handbook contains methodology for gathering predetermined baseline information and develops indicators of change within multiple ecosystems, found within the influence of the RRNF. Three components of the ecosystem (Physical/Chemical, Biological and Human Dimension) are described in this Handbook; this organization is complementary to current ecosystem principles, monitoring under the Northwest Forest Plan, and with the Monitoring Strategy Update.

Monitoring Strategy for 2006

Federally appropriated funding for monitoring and monitoring reports has been minimal over the previous few years. As with previous Monitoring Reports, reporting is done on specific elements of the respective monitoring strategies, rather than prepare a complete report on all elements. The goal of this approach was to provide meaningful data or results on elements actually monitored, rather than to generate incomplete information on all elements. In addition, several specific inventory and monitoring projects were conducted in FY 2006, with appropriated funding. This report includes summaries of those projects. This years report also includes a summary of the status of implementation activities. Specifically, this FY 2006 report includes discussion of the following:

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Monitoring and Evaluation

Monitoring and evaluation in the Pacific Northwest Region (Region 6) is designed to be reactive to the major transformation molding the agency nationally, and inherent to society as a whole. The scope and importance of activities on or near the National Forests have become significant to “everybody”. In this context, monitoring exists to serve management. For that reason, the Rogue River-Siskiyou National Forest and Region 6 strives to put monitoring and evaluation in the context of “adaptive management”.

For the purpose of this report, Forest Plan monitoring is done to measure progress in Forest Plan implementation. It consists of gathering data, making observations, and collecting and disclosing information. Monitoring is also the means to determine how well objectives of the Forest Plan are being met, and how appropriate the management Standards and Guidelines are for meeting the Forest’s outputs and providing environmental protection. Monitoring is used to determine how well assumptions used in the development of the Forest Plan reflect actual conditions.

Monitoring and evaluation may lead to changes in practices or, provide a basis for adjustments, amendments, or Plan revisions. Monitoring is intended to keep the Forest Plan dynamic and responsive to change. Upon evaluation of the data and information, determinations are made as to whether or not planned conditions or results are being attained and when they are within Forest Plan direction. When a situation is identified as being outside the limits of acceptable variability, changes may need to occur.

While monitoring and evaluation comprises the control system over management activities on the Forest, each has a distinctly different purpose. Monitoring is gathering information and observing management activities. Forest Plan **monitoring** on the Rogue River and Siskiyou National Forest has been organized into four levels:

Implementation Monitoring is used to determine if the objectives, standards, guidelines, and management practices specified in the Forest Plan are being implemented. In other words, “Did we do what we said we were going to do?”

Effectiveness Monitoring is used to determine if the design and execution of the prescribed management practices are effective in meeting the goals, objectives, and desired future condition stated in the Forest Plan. Simply stated, “Are the management practices producing the desired results?”

Baseline Monitoring is designed to characterize the existing or previously existing condition for comparison with future monitoring or predicted conditions. In some cases this can refer to an initial inventory or set of measurements taken at the beginning of monitoring efforts. This type of monitoring is useful as a starting point or comparison for the other types of monitoring and can form a basis for trend detection.

Validation Monitoring is used to determine whether data, assumptions, and coefficients used to predict outcomes and effects in the development of the Forest Plan are correct. Again, stated another way, “Are the planning assumptions valid, or are there better ways to meet Forest Plan goals and objectives?”

Evaluation is the analysis and interpretation of the information provided by monitoring. Evaluation is the feedback mechanism identifying whether there is a need to change how the Forest Plan is being implemented to comply with existing direction, or whether there is a need to change Forest Plan direction itself through amendment or revision exists.

Typically, several years of effectiveness and validation monitoring results are needed to permit meaningful evaluation of trends against baseline data. For this reason, this report contains few results on the effectiveness of the Standards and Guidelines or the validity of Forest Plan models and assumptions. It emphasizes the question, “Did we do what we said we were going to do?” as well as reporting progress that is being made on answering questions of effectiveness and validation.

MONITORING RESULTS

Part One: Selected Forest Plan Items for the FY 2006 Report

This section presents the results and evaluation of the selected Forest Plan Monitoring Items that were monitored during FY 2006, for the Rogue River and Siskiyou National Forests. Each Monitoring Item is briefly described by the monitoring Category, Group and the individual Goals and Objectives that comprise the Monitoring Item. Also brought forward are selected Monitoring Questions from the Monitoring Worksheets, based on the respective monitoring strategies. Based on these questions, results and evaluations are presented, including recommendations. Note that monitoring items are sometimes reported in this document separately for each National Forest, yet together according to the selected element. Recommendations are applicable to both National Forests, unless otherwise noted.

Physical Resources

MONITORING ITEM: *AIR QUALITY*

GOAL(S), MONITORING QUESTION(S): The goal for the Rogue River National Forest is to reduce Total Suspended Particulates (TSP) produced by prescribed fire to 56% of the base year production level. This goal is to be reached within ten years from the base year, which is 1991. Total TSP for 1991 was 39,708 tons. The goal for the Siskiyou National Forest is 7,300 tons or less produced on an annual basis. The monitoring questions include:

- **Is Best Available Technology (BAT) as defined by the Oregon State Implementation Plan (SIP), being utilized?**
- **Are management activities meeting the requirements of the Oregon SIP?**
- **Are tons of yearly TSP production on a downward trend toward the 2001 goal?**
- **Siskiyou NF: Does Total Suspended Particulate produced from planned ignitions exceed 7,300 tons Forest-wide annually?**

FINDINGS and EVALUATION

Rogue River National Forest

Results of monitoring show that Best Available Technology is being used. Review of project plans show a trend in the use of treatment methods other than prescribed fire. Management activities were in compliance with the Oregon State Implementation Plan (SIP).

For fiscal year 2006, 391 acres were burned with prescribed fire and approximately 4,677 tons of fuel consumed. This equates to **117 tons of Total Suspended Particulate (TSP)** produced. The trend is clearly downward and has reached the 2001 maximum production goal of 22,236 tons. With the planned increase in hazardous fuels reduction projects in the near future, TSP production may increase, but it should still remain well below the 22,236 ton goal (56% of the 1991 base year TSP). This portion of the Forest met all Smoke Management Guidelines and experienced no intrusions. Based on these findings, monitoring indicates that management direction is being achieved.

Siskiyou National Forest

In fiscal year 2006 there were 2,973 acres burned with prescribed fire and approximately 64,431 tons of fuel consumed. This equates to **1,585 tons of total suspended particulates (TSP)** emitted from these burns. This is far below the threshold (.06%) of 7,300 tons. With the planned increase in hazardous fuels reduction projects in the near future, TSP amounts may increase, but should still stay well below the 7,300 ton threshold of concern. This portion of the Forest met all Smoke Management Guidelines and experienced no intrusions. Based on these findings, monitoring indicates that management direction is being achieved.

RECOMMENDATIONS: Based on these findings, monitoring indicates that management direction is being achieved on the Forest.

Biological Resources

MONITORING ITEM: *VEGETATION MANAGEMENT EFFECTIVENESS*

GOAL(S), MONITORING QUESTION(S): The Forest goal is to be in compliance with the Forest Plans and with the Regional Guide, which specifies compliance with the *Managing Competing and Unwanted Vegetation Final Environmental Impact Statement* and *Mediated Agreement*. Overall goals include utilization of management practices that best suit the land management objectives. The monitoring questions include:

- 1. How are the number of trees planted per acre and their survival and growth being affected by the amount of site preparation being done on the Forest?**
- 2. Are young conifers being released from competing vegetation in a timely and cost-effective manner?**
- 3. Are long-term growth and yield projections being affected by the use (or non-use) of herbicides and prescribed burning?**
- 4. Is the Forest meeting the intent of the *Managing Competing and Unwanted Vegetation Final Environmental Impact Statement* and *Mediated Agreement*?**
- 5. Are Best Management Practices (BMPs) being effectively implemented for noxious weeds, Port Orford cedar disease (POC) and sudden oak death (SOD)?**

FINDINGS AND EVALUATION:

1. In fiscal year 2006, the Forest planted 2,041 acres, 580 acres of which were in the Biscuit Fire area. First year survival averaged 64%, ranging from 55 to 100%, which is a substantial drop from the previous year's report of 90%. Only the Douglas-fir seedlings were poor survivors with much of the Douglas-fir mortality attributed to delayed planting following a late snowfall, poor control of seedling storage, and lack of attention to weather and soil conditions. In all, eight species were out-planted.

In addition to artificial reforestation, the Forest certified 425 acres of natural regeneration, of which 183 acres fell within the Biscuit Fire area.

The Rogue River-Siskiyou National Forest continues to prioritize an aggressive animal damage control program to improve reforestation success.

There was a lack of collected survey data on third year seedling survival with only 2 of the 5 Districts collecting and reporting information. Third year seedling survival ranged from 74 to 100%, with the average of 88%. As with the first year seedlings, the Douglas-fir third year seedlings were the poorest performers. Of the reported 4,155 acres, about 4,030 acres were considered a first time success. Within the Biscuit Fire area 3,095 acres were considered first time successes, representing 77% of the Forest's first time successes.

Two introduced pathogens that cause tree mortality are present on the Rogue River-Siskiyou National Forest: white pine blister rust, which infects the five-needle pine species (sugar pine and western white pine), and Port Orford-cedar (POC) root disease. These pathogens are particularly devastating to young sugar pine and western white pine and POC regeneration. The Forest continues to plant rust-resistant tree five-needle pine (sugar pine and western white pine) seedlings in its reforestation program to maintain five-needle pines in the ecosystem. The Forest is also planting root disease resistant Port Orford-cedar seedlings to maintain POC in its ecosystems.

2. Crop tree conifers are being released from competition with brush and non-crop trees release is being done as funding allows. Release from woody vegetation can be expensive and usually requires manual control methods with chainsaws to remove competing vegetation. Manual release treatments were accomplished on 922 acres (none within the Biscuit Fire area) in fiscal year 2006. An additional 601 acres of release needs were identified in fiscal year 2006 with the balance at the end of 2006 being 4,059 acres of release needs.

In fiscal year 2006 1,413 acres (none within the Biscuit Fire area) of pre-commercial thinning were accomplished. An additional 49 acres of pre-commercial thinning needs were identified in fiscal year 2006 with the balance at the end of the year being 17,540 acres. The Forest has traditionally only received funding for 5 to 7 percent of the total need for pre-commercial thinning.

Pruning accomplished in fiscal year 2006 totaled 966 acres (none within the Biscuit Fire area). The outstanding need identified for pruning at the end of fiscal year 2006 is 40 acres.

Costs for all Timber Stand Improvement (TSI) activities has risen over the years due to the Forest's commitment to treat activity created slash where designated to reduce the fuels hazard on the landscape.

Low treatment percentages are due to lack of funding. Not accomplishing planned release and pre-commercial thinning treatments *will* have an adverse effect upon meeting timber outputs projected in the Land and Resource Management Plan. Not accomplishing planned release, pruning, and pre-commercial thinning keeps managed stands in conditions vulnerable to damage or destruction by wildfire effects. The Forest continues to seek funding that would enable it to improve the fuels condition class rating and improve the resistance to stand replacement wildfire events.

In fiscal year 2006, reforestation monitoring reports indicated prescribed treatments are cost-effective, based on minimal monitoring of other resource activities (weed control, range, fuels, wildlife, etc.). All harvest units were monitored for stocking levels and certified as meeting Forest stocking standards as prescribed.

3. No recent growth simulations have been made comparing long-term growth and yield of herbicide treated stands with non-treated stands. However, yield tables prepared for the Forest Plans show an approximate 5 to 10% reduction in cubic volume mean annual increment and a 10-year delay in culmination of mean annual increment for non-treated stands.

4. An estimated 420,000 acres of National Forest System lands in the Pacific Northwest Region (Region Six) are currently infested with invasive plants². These plants are damaging biological diversity and ecosystem integrity within and outside the National Forests, including the Rogue River-Siskiyou. Invasive plants lead to many adverse environmental effects, including: displacement of native plants; reduction in habitat and forage for wildlife and livestock; loss of threatened, endangered, and sensitive species; increased soil erosion and reduced water quality; reduced soil productivity; and changes in the intensity and frequency of fires. Invasive plants can spread between National Forest System lands to neighboring areas, affecting all land ownerships.

In 2005, the Regional Forester identified the need for: (1) Forest Plan level management direction that will reduce the extent and rate of spread of invasive plants and help prevent new infestations; (2) Release from the Forest Plan direction established by the 1988 ROD and 1989 Mediated Agreement so that new practices, technologies, and formulations of herbicides are available for use in invasive plant management; and (3) An updated list of herbicides available for use by the Forests.

The Final Environmental Impact Statement for the *Invasive Plant Program - Preventing and Managing Invasive Plants* (FEIS) considered three action alternatives to meet these needs. In a Record of Decision signed on October 11, 2005, the Regional Forester selected the Proposed Action from the FEIS, with modifications. Under this decision, invasive plant management direction is added to all National Forest Plans in the Region (see ROD Appendix 1 for full text added to Forest Plans). The decision was not be retained as a Regional-scale decision; rather it becomes part of the individual Forest Plans.

Under this decision, all National Forests in the Region are released from direction established by the 1988 Record of Decision for Managing Competing and Unwanted Vegetation (ROD) and 1989 Mediated Agreement for *invasive* plant management. Parts of the 1988 ROD and 1989 Mediated Agreement that apply to unwanted *native* vegetation are not affected by this decision. Invasive plant management direction stemming from these documents is replaced by new direction, in the form of:

- Desired Future Condition (DFC) statement,
- Goals and objectives statements,
- Standards for preventing the introduction, establishment and spread of invasive plants,
- Standards for invasive plant treatment and site restoration, and
- An inventory and monitoring framework.

The purpose of this management direction is to facilitate subsequent actions to eliminate or control invasive plants so that: (1) desired conditions on National Forest System lands can be attained; (2) federal land managers' ability to provide goods and services from the National Forest System lands is maintained; and (3) the Forest Service's ability to cooperate with similar efforts across other ownerships is improved.

² Invasive plants are defined here as "a non-native plant whose introduction does or is likely to cause economic or environmental harm or harm to human health" (Executive Order 13122). Invasive plants are distinguished from other non-native plants by their ability to spread (invade) into native ecosystems.

Management direction related to invasive plants (beyond the 1988 ROD and 1989 Mediated Agreement) is also established by Forest Service Manuals, letters of Regional policy and individual Forest Plan standards in Region Six. This decision adds new direction, but does not vacate existing invasive plant management direction beyond the 1988 ROD and 1989 Mediated Agreement. Inconsistencies between new and existing standards will be reconciled on a Forest-by-Forest basis, as Forest Plans are amended or revised or specific projects are planned.

This decision, in itself, does not approve any site-specific projects. Site-specific treatment decisions will be based on location, biology and size of the target invasive plant species, site conditions, and integrated resource objectives. Invasive plant treatment projects will be subject to future National Environmental Policy Act (NEPA) and Endangered Species Act (ESA) analysis before being implemented.

5. In November 1998, the *Rogue River NF Noxious Weed Strategy* emphasized *Prevention* and identified appropriate treatment methods. In May 1999, an environmental assessment for *Integrated Noxious Weed Management on the Rogue River National Forest* further refined appropriate methods based on species and size of infestation for known noxious weed sites. On September 1, 1999, the Forest Supervisor, as the responsible official, made a decision, documented via a Decision Notice, to authorize noxious weed management practices, including but not limited to the use of herbicides, on the Rogue River National Forest.

Implementation of this decision has been ongoing. New information regarding the types of herbicides available for use under this decision has occurred via the 2005 Record of Decision (ROD) signed by the Regional Forester of the Pacific Northwest Region (R6), for Pacific Northwest Region Invasive Plant Program - Final Environmental Impact Statement (FEIS) - Preventing and Managing Invasive Plants. An opportunity was identified to utilize new herbicides approved in the R6 2005 ROD and FEIS and potentially reduce the environmental effects of herbicide use.

The R6 2005 ROD included a comparison Summary of Herbicides and Surfactants Risk Ratings and the opportunity to use all ten chemicals was authorized. An Interdisciplinary Team reviewed the herbicide information and the authorization to use these ten chemicals and concluded that this would NOT change the 1999 Rogue River National Forest decision. The Forest's 1999 decision provided for the use of herbicides, though fewer were authorized for use than in the Region's 2005 decision. There would now be an option of using additional chemicals, providing increased opportunity to use those that pose the least risk to the environment, while providing for effective treatment of the invasive plants.

The table below represents the suite of chemicals now available for use under the Forest's 1999 decision and the Region's 2005 decision.

Table 1-1. Summary of Herbicide and Surfactant Risk Ratings

Risk Rating	Aquatic³	Wildlife⁴	Worker Health⁵	Public Health⁶
LOW	clopyralid, imazapic, metsulfuron methyl, NPE surfactant	chlorsulfuron, imazapic, imazapyr, metsulfuron methyl	chlorsulfuron, imazapic, imazapyr, metsulfuron methyl clopyralid, glyphosate, metsulfuron methyl, picloram, sethoxydim	chlorsulfuron, imazapic, imazapyr, metsulfuron methyl, triclopyr
MOD	chlorsulfuron, imazapyr, sulfometuron methyl	clopyralid, glyphosate, metsulfuron methyl, picloram, sethoxydim		clopyralid, glyphosate, picloram, sethoxydim
HIGH	sethoxydim, glyphosate, picloram, triclopyr	triclopyr, NPE surfactant	triclopyr, NPE surfactant	NPE surfactant

Aquatics: LOW = Under GLEAMS parameters, the concentrations of herbicides in water did NOT exceed level of concern

Wildlife: LOW = Exposure scenario results in dose below the toxicity index

MOD = Exposure scenario results in dose exceeds the toxicity index for 1-2 species

HIGH = Exposure scenario results in dose exceeds the toxicity index for >3 species

WORKER Health: LOW = HQ less than 0.01

MOD = HQ less than 0.1

HIGH= HQ > 1.0

PUBLIC Health: Used contaminated water scenario. HQ thresholds same as for WORKER Health

In accordance with Forest Service policy, the Forest Supervisor found that new information or changed circumstances regarding this decision did not require a new or changed decision under the National Environmental Policy Act. Further, the new information indicates that that this changed condition will not have a significant impact on the human environment, with the additional use of new herbicides having less potential effect that those associated with the original decision.

Best Management Practices (BMPs) further provides prevention direction. The Rogue River-Siskiyou National Forest is currently implementing *Best Management Practices for Noxious Weed Prevention and Management, Port-Orford-Cedar Root Disease Prevention and Management, and Sudden Oak Death Prevention and Management* (February 2002). The objectives of this interim direction are to 1) reduce the risk of spreading noxious weeds; 2) prevent the establishment of new invaders; 3) integrate weed management practices into resource programs; 4) conduct research and monitoring to evaluate effectiveness and identify emerging issues; 5) reduce spread and integrate management practices for POC and SOD; and 6) build awareness within the agency.

³ R6 2005 FEIS, Fisheries Biological Assessment

⁴ R6 2005 FEIS, Appendix P, Summary of Herbicide Effects to Wildlife

⁵ R6 2005 FEIS, Appendix Q, Human Health Risk Assessment

⁶ *ibid*

Port-Orford-Cedar Root Disease (POC)

Port-Orford-cedar (POC) is an ecologically and economically important tree species. Its natural range is geographically limited to southwestern Oregon and northwestern California, but within that area, it occupies a broad environmental range. Port-Orford-cedar is affected by an exotic root pathogen, *Phytophthora lateralis* (PL). The pathogen causes POC root disease and is nearly always fatal to the tree it infects.

Port-Orford-cedar program objectives are to maintain POC as an ecologically and economically significant species on National Forest (NF) lands. Port-Orford-cedar management provides cost-effective mitigation for controllable activities creating appreciable additional risk to important uninfected POC, not to reduce all risk to all trees at all cost. Port-Orford-cedar management slows the spread of the pathogen enough to maintain POC's significant ecological and economic functions, without the cost of the management strategy exceeding its effect on the value of these functions.

There are three Forest Service management regimes for POC across its range. In Region 6, Rogue River-Siskiyou NF, a POC Record of Decision (ROD) amends the Siskiyou National Forest Land and Resource Management Plan (LRMP). On March 29, 2004 a Record of Decision was signed by the Forest Supervisor to adopt new direction for managing Port-Orford-Cedar root disease (POC). This ROD takes a more aggressive approach into managing POC during planning of transportation, off-road vehicle use and special forest products activities and other forest uses. Following are a summary of key points of this decision; the ROD amends the 1989 Siskiyou NF Forest Plan by:

- Better describing available treatments.
- Providing a risk key to help managers consistently determine which special protection measures need to be applied.
- Providing special emphasis on protecting 144 two thousand acre watersheds that do not currently have the disease.
- The ROD does not change any NW Forest Plan land use allocations or affect private land.
- Port Orford cedar may be removed 25-50 feet of some roads to reduce potential for new infection of healthy Port-Orford-cedar populations or to remove diseased trees.
- Complex timber sales and fuels treatments may require specific equipment types, seasonal operations, and washing of equipment.
- Fire fighting activities will include treating potentially infested water with Clorox bleach, but only when the requirements do not delay protection of life and private property.

The POC ROD applies to all projects with a decision date after March 29, 2004. The plan amendment includes: a) Standards and Guidelines for General Direction applicable everywhere and Management Practices optional for projects, b) a Risk Key, and c) Identification of 7th field watersheds, which require implementation of Management Practices if the management activity introduces appreciable additional risk to the POC in that watershed.

In Region 6, on the Siuslaw NF, POC direction is described in the plan for the Oregon Dunes National Recreation Area (ODNRA) and is in the context of globally significant plant communities, of which POC are one component. There is no ODRNA plan direction specific to POC management and no forest level standards and guidelines addressing POC management.

In Region 5, POC management is currently being updated to reflect many, but not all the management strategies described in the POC FSEIS and ROD. Region 5 utilizes the General Direction and Management Practices from the POC ROD, but not the Risk Key nor the concept of the 7th field watersheds. Region 5 will participate in the PL resistance breeding program at a more limited level than Region 6.

Within the range of POC, there are 52 fifth field (analytical) watersheds that contain POC. Thirty-five fifth field watersheds (67.3 percent) are infested with PL. However, this is a misleading number. In those analytical watersheds where PL occurs, on average, 83 percent of the acres with POC remain uninfested. Port-Orford-cedar occurs on approximately 271,963 federally administered acres. 89,748 acres with POC are considered high risk sites. High risk sites are along roads and low lying wet areas (e.g., streams, lakes, swamps, and drainage ditches). All other sites are considered low risk.

Mitigation treatments have been used and monitoring has occurred to determine their level of success. Cost/Benefit analyses for two common management practices, vehicle washing and roadside sanitation, have been developed as part of the updated Region 5 POC strategy: *Managing for Healthy Port-Orford-cedar in the Pacific Southwest Region* (in press). Inoculum load can be reduced by 90 to 95 percent by vehicle washing (Goheen et al. in press) at a cost of \$750 / day using Forest Service staff.

Roadside sanitation has been shown to successfully remove 100 percent of POC under 7 inches DBH along twenty miles of road on the Wild Rivers RD in southwest Oregon. The roadside sanitation work was accomplished by service contract at a cost of \$300 to \$400 per acre or \$2,700 to \$3,600 per road mile (9 treatment acres / road mile). Goheen and Marshall (2003) found that where POC root disease was present and severe along a road, sanitation substantially reduced the amount of inoculum four years after treatment.

A qualitative assessment of other management practices has been completed (see table below). This assessment was developed by field observation over time on sites in and around project areas where treatments have been conducted. A professional forester or forestry technician visits the site several times to determine (a) if the prescription has been correctly implemented and (b) whether or not any evidence of POC mortality / PL infection has developed in or near the project area. Each project is given a rating of 1 to 5 for correct implementation after the project is complete. Each disease management technique is given a rating of 1 to 3 for effectiveness (1= not effective, 2=partially effective, 3= effective) based on combined results of root disease observations for all visits.

The data below summarizes the average results for 70 multifaceted projects done on a variety of sites on the Rogue River-Siskiyou NF between 1994 and 1999.

Table 1-2. Qualitative assessment of Other Management Practices

Activity	Average Implementation Rating	Average Effectiveness Rating
Temporary road closures	4.4	2.5
Dry season operations	4.3	2.9
Access avoiding infested areas	4.6	2.9
Entering units in priority	4.4	2.9
Minimizing risk by road location	4.6	2.4
Improving road surfaces	3.9	2.4
Directing water off roads	5.0	2.5
Preventing deposit of soil waste in uninfested areas	4.5	2.3
Dry season road maintenance and construction	4.5	2.9
Avoiding use of infested water sources	3.8	2.4

Staff from the USDA-FS Southwest Oregon Forest Insect and Disease Service Center, USDA-FS Northern California Shared Service Area, and Region 5 and 6 Forest Health Protection will continue to work with field units to evaluate and coordinate existing management techniques to reduce the occurrence of PL, retain healthy POC, and have and will continue to provide hands-on training as needed.

Sudden Oak Death (SOD)

Unprecedented levels of tanoak and coast live oak mortality were noted first in Marin County, CA in the early to mid-1990s. Local residents coined the phrase “Sudden Oak Death” to describe the apparently rapid tree mortality they observed. The cause was then unknown. In 2000, a new species of *Phytophthora*, a fungus-like water mold of unknown origin, was isolated from cankers (localized areas of dead cambium) on dying trees and later was found to be the causal agent. Soon it was recognized that the same pathogen was causing leaf blight, stem cankers, and tip dieback on nursery-grown rhododendrons. The new species was named *Phytophthora ramorum* in 2001 (Goheen et al. 2006).

Phytophthora ramorum is an Oomycete, a water mold that looks like a fungus but is more closely related to some marine algae. Most *Phytophthora* species are root pathogens, but *P. ramorum* affects above-ground plant parts. *P. ramorum* is well adapted to the mild, wet conditions of the Pacific Northwest. The pathogen forms sporangia (sacs of spores) on infected leaves or twigs. The sporangia are spread in wind and rain and can release swimming zoospores if they land on a wet surface. The zoospores germinate and infect the plant, starting a new infection. *Phytophthora ramorum* also makes thick-walled resting spores (chlamydospores) in infected plant parts, which allow it to survive heat and drought and to persist for months in soil and plant debris (Goheen et al. 2006).

The pathogen has a broad host range including hardwood trees, such as coast live oak; landscape plants, such as rhododendron; herbaceous plants, such as western starflower; and softwood trees, such as coast redwood and Douglas-fir. Where it has become established in California, *P. ramorum* has adversely affected ecosystem functions, increases fire and safety hazards, and reduces property values in developed areas (Rizzo and Garbelotto 2003).

In Oregon, the pathogen was detected in 2001 via aerial survey. State and federal regulatory actions have been implemented to help prevent the movement of infested wood, bark, forest greenery and other wild material, soil, and host nursery stock from infested areas. At this time, 21.5 square miles of forest in Curry County, Oregon are subject to this regulation. For current information on quarantines and other Sudden Oak Death regulations, visit the Oregon Department of Agriculture (ODA) website at <http://egov.oregon.gov/ODA/PLANT>, and the USDA Animal and Plant Health Inspection Services (APHIS) website at <http://www.aphis.usda.gov/ppq/isp/ramorum>.

To date, approximately 88 infested acres have been identified in Curry County. In the last week of April 2006, a *Phytophthora ramorum* infection site was confirmed on National Forest lands in the Chetco River drainage approximately 8-9 miles northeast of Brookings near Loeb State Park. The legal description is T.40S., R.13W., section 13, W.M., Curry County, Oregon.

Disease confirmation was based on a field review of visual symptoms and DNA testing at Oregon State University. The boundary of the treatment area (also referred to as the eradication zone) is approximately 300 feet beyond known infected trees. The infected tanoak occur along the boundary of State of Oregon Parks land and National Forest System land. The total eradication zone was approximately 10-11 acres of which an estimated 5 acres occurs on National Forest.

The District Ranger of the Chetco Ranger District decided to treat the infected area on National Forest System Lands within the eradication zone. All tanoak (*Lithocarpus densiflorus*) and other hosts with stems meeting minimum requirements suitable for injection (approximately 1 inch in diameter and greater) within the eradication zone were treated by injecting the chemical glyphosate⁷ using a method referred to as “hack and squirt”, two weeks prior to cutting the stems. The hack and squirt method employs a device called a “hypo-hatchet”. The hypo-hatchet is a hatchet with an internal herbicide delivery system connected by a hose to an external herbicide container. When the hatchet strikes a tree, the blade penetrates into the sapwood. The impact of the striking action drives a piston forward that delivers 1 milliliter of herbicide into the cut.

All tanoaks, Pacific rhododendron (*Rhododendron macrophyllum*) and evergreen huckleberry (*Vaccinium ovatum*) within the eradication zone were cut down. Oregon myrtle (*Umbellularia californica*) were also cut depending upon the presence of symptoms and plant location. Any other plant species found to be infected within the eradication zone were also cut. All cut plant materials less than or equal to eight inches in diameter were disposed of by burning as soon as reasonably and safely possible. Host leaf litter and other fine plant material was raked into the piles and disposed of as well. Implementation of this action was accomplished by a crew under the supervision of the State of Oregon who were completing the same treatment on approximately 6 acres of adjacent State Park lands.

⁷ Glyphosate is an herbicide used by the Forest Service. There are currently 35 commercial formulations of glyphosate that are registered for forestry applications. Refer to: *Glyphosate – Human Health and Ecological Risk Assessment Final Report*, USDA Forest Service, March 1, 2003.

Treatment of this site (confirmed in April 2006, herbicide treatment in June 2006) was completed (the burning was done) in late fall 2006. Vegetation response, pathogen presence, and wildlife (amphibian) surveys have been done in treated areas and at untreated adjacent sites. Pathogen monitoring and vegetation response monitoring will continue until the site has been declared by ODA to be disease-free for two years. Since the discovery of this site, four aerial surveys were flown (2 fixed wing, 2 helicopter) over tanoak ecosystems that include lands managed by the Rogue River-Siskiyou NF. All dead tanoaks identified in those surveys were visited on the ground and examined for symptoms and signs of *Phytophthora ramorum*. No new SOD sites were found on NFSL.

CONCLUSIONS AND NEEDS: Based on these findings, there is no immediate action needed for vegetation management effects on timber harvest treatments. It is recommended that further action be taken to develop monitoring practices that will verify if other resource activities (weed control, range, fuels, wildlife, etc.) are being planned and designed in compliance with this agreement and if adequate monitoring of effectiveness is being conducted. Forest Plan modeled outputs are not consistent with the changes enacted by the Northwest Forest Plan; however, this was predicted and no immediate change is recommended.

The POC ROD plan amendment includes: a) Standards and Guidelines for General Direction applicable everywhere and Management Practices optional for projects, b) a Risk Key, and c) Identification of 7th field watersheds, which require implementation of Management Practices if the management activity introduces appreciable additional risk to the POC in that watershed.

Continue to monitor and aggressively treat *Phytophthora ramorum* if detected on National Forest System lands. Continue to plant/interplant with rust resistant five-needle pines to maintain these minor species on the landscape and provide species diversity for the Forest. Continue to improve integration between silvicultural and fuels treatments to reduce the fuels hazards where possible and to improve the resiliency to wildfire effects across the Forest.

MONITORING ITEM: ANADROMOUS AND RESIDENT FISH HABITAT

GOALS(S), MONITORING QUESTIONS(S): The Forest goal is to provide and maintain habitats with diversity and quality, capable of recovering populations of resident and anadromous salmonid fish species to the potential of site productivity. Monitoring questions are:

- **Are the quantity and quality of rearing pools and coarse woody material being generated in the stream channel adequate for fish habitat to address objectives of site potential?**
- **Are Forest Plan goals, objectives, and desired conditions for anadromous and resident salmonid fish being achieved? Are management activities consistent with ACS objectives?**
- **How effective are fish habitat improvement projects on stream channel configurations?**

INTRODUCTION

The Rogue River–Siskiyou National Forest has accomplished considerable monitoring over the past decade to track changes in physical conditions in fish-bearing streams, such as: R6 Level 2 Stream Surveys, channel morphology monitoring, stream shade surveys, and temperature monitoring – and biological conditions in streams – macroinvertebrate sampling, spawning surveys, juvenile fish census surveys. Monitoring helps track the successful implementation and the effectiveness of restoration work and maintain up-to-date information on fish populations, stream habitat and water quality conditions in Forest streams.

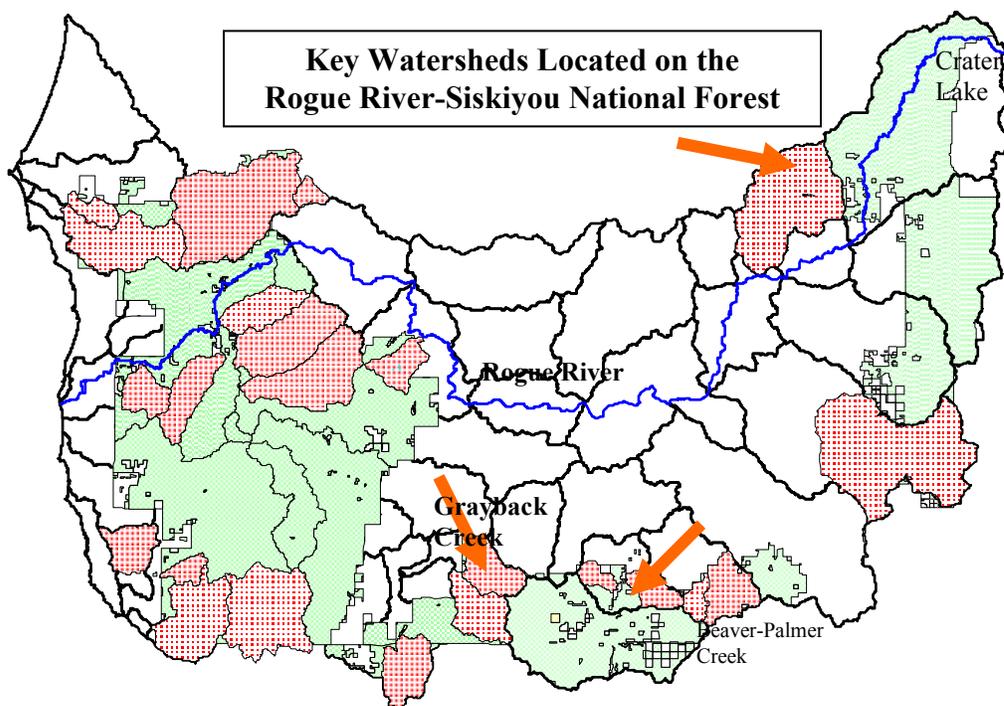
This monitoring report summarizes some biological data collected during the past decade and advocates for a simpler biological monitoring approach toward tracking restoration projects for the next several years. The relationships between local salmon spawning in a reach or watershed and juvenile salmon densities plus the presence of ocean-derived nutrients the following summer have a strong correlation. This appears particularly true for Southern Oregon Northern California Coasts (SONCC) coho salmon, listed as threatened under the Endangered Species Act, which occupy many stream reaches on the Forest in the Rogue River sub-basin.

Watershed restoration on the Forest includes a variety of activities including fish passage “fixes” at road crossings, riparian silviculture to accelerate tree growth in riparian areas, road upgrades and road decommissioning, erosion prevention and repair and instream habitat improvement work. Considerable instream and riparian restoration work has been done on the Rogue River–Siskiyou National Forest since the mid 1980s. Early restoration work consisted of mostly improving salmon and trout habitat in stream channels with the addition of large wood materials and riparian forest silviculture work. In the mid 1990s, restoration emphasis broadened to include road fixes and upslope work to arrest erosion and delivery of sediment to streams.

Anadromous fish, namely Chinook and coho salmon, steelhead trout and cutthroat trout were the principal target species of restoration work. The Forest has a salmon spawning survey program in place to gauge the recovery of anadromous fish populations in areas where restoration work has taken place. Measuring the number of redds and adult spawners is one method to assess watershed restoration techniques and specifically fish habitat improvements biologically. Data from coho salmon spawning surveys is employed here to show trends in stream reaches on the Forest. A high variation of spawners is attributed to changeable freshwater and ocean conditions during the three to five year period of growth to maturity for coho salmon. Long term monitoring of coho spawner escapement in Forest streams will help assess salmon population trends in a particular watershed.

Twenty-three sub-watersheds or watersheds were designated as Key Watersheds under the 1994 Northwest Forest Plan. These watersheds are deemed high priority for restorative work. Much of the monitoring of fish habitat, spawner escapement, juvenile fish populations, macroinvertebrates and aquatic/riparian habitats occurs in these watersheds. These watersheds are well distributed in Klamath Mountain geology except for two, which are located in Cascade Mountain geology – Elk Creek and Little Butte Creek as depicted in the figure below. These Key watersheds are diverse geologic areas with highly variable habitat conditions for fish.

Figure 1-1. Key Watersheds designated by the Northwest Forest Plan and the three monitoring watersheds in this report.



LEGEND

- Key RRS NF watersheds
- Non Key RRS NF watersheds
- Watersheds pertaining to this report

DESCRIPTION OF WATERSHEDS

This monitoring report focuses on three 5th field watersheds in the Rogue River sub-basin: Elk Creek, Applegate River-McKee Bridge, and Grayback. These 5th field watersheds are three of the highest priority 5th field watersheds for fisheries on the Forest.

Bitterlick and Sugar Pine Creeks are located in the Elk Creek 5th field watershed and the upper Rogue River sub-basin. Elk Creek is approximately 85,000 acres in size. Medford-BLM and the Forest Service primarily manage the upper watershed and headwater areas. The lower 12 miles of the main stem are private lands used mostly for raising cattle and adjacent hill slopes are private timberlands. Most surface water in main stem Elk Creek is appropriated for pasture irrigation and stream flows are minimal in the valley during summer months. Water and habitat conditions in lower Elk Creek on private lands are near lethal for salmonids in the summer months due to elevated water temperatures and low flows. A dam in the lower watershed was partially constructed in the 1990s and the project has since been suspended. A fish counting station at the dam site was started in 1993 by Oregon Department of Fish and Wildlife (ODFW). Trap and haul method of fish passage mitigation was initiated during 1990; all fish entering the trap are counted and hauled around the partially build dam structure. The dam structure was a total or near total block to fish migration for several years before the trap and haul was implemented. Straying hatchery coho salmon are not allowed to migrate upstream of the partially constructed dam. Coho salmon escapement has grown from a few dozen up to a high of 2,700 adults in 2004-05.

Beaver and Palmer Creeks are located in the Applegate River-McKee Bridge 5th field watershed in the Applegate River sub-basin in the Siskiyou Mountains of the Klamath Geological Province. Beaver and Palmer Creeks are about 16,000 and 7,000 acres in size, respectively. These two streams and nearby Star Gulch offer the most upstream tributary anadromous spawning habitat in the Applegate River below the Applegate Dam – a full barrier to fish migration. The Forest Service manages most of these two sub-watersheds and a small portion of valley is land suitable for agriculture. Little irrigation withdrawal occurs in these two drainages. The geology of the Beaver Creek sub-watershed contains extensive decomposed granite soils. Bedload movement of fine granite sand from this type of soil can occur during floods and resultant erosional events.

Grayback Creek is located in the Illinois River sub-basin in the Siskiyou Mountains. It is about 18,000 acres in size and almost wholly managed by the Forest Service with a few sections of private timberlands. Little valley land suitable for agriculture is present and irrigation withdrawals are nonexistent. This stream maintains a good surface flow during the summer months and water temperatures are conducive to salmonid rearing. The geology of the Grayback Creek sub-watershed, decomposed granitic soil conditions, is similar to Beaver Creek.

MONITORING BACKGROUND

Three types of monitoring are integrated and discussed below: Juvenile Salmon Census, Ocean Isotope Sampling, and Salmon Spawning Surveys.

Juvenile Salmon Census

A five year monitoring study in two tributaries in the upper Elk Creek watershed – Bitterlick Creek and Sugarpine Creek was completed. This monitoring tracked the density of juvenile coho salmon in pools compared with the total numbers of coho salmon spawners that were trapped and hauled past the partially constructed Elk Creek Dam. Simultaneously to this monitoring was testing of ocean-derived nutrients in pairs of salmon streams and trout streams in these two sub-watersheds. Figures on the following pages display a summary of the results and described below.

Figure 1-2 is a graph comparing total coho salmon spawners passed over the partially completed Elk Creek Dam approximately 12 miles downstream of Bitterlick Creek and the juvenile coho salmon density per square yard of pool habitat in 30 pools in Bitterlick Creek the following August for five years. Juvenile coho densities seem to track well with total spawner escapement. There appears to be no indication of saturation or over-seeding of young-of-the-year coho salmon given the numbers of spawners during these years monitored. Figure 1-3 is a similar graph for Sugarpine Creek which confluences with Elk Creek about 2 miles downstream of the Bitterlick/Elk Creek confluence.

Figure 1-2. Bitterlick Creek: Total Adult Coho Spawner Escapement (Line) and Average Number of Juvenile Coho Salmon per Square Yard of the Surface Area of Pool Habitat the following summer (Bars).

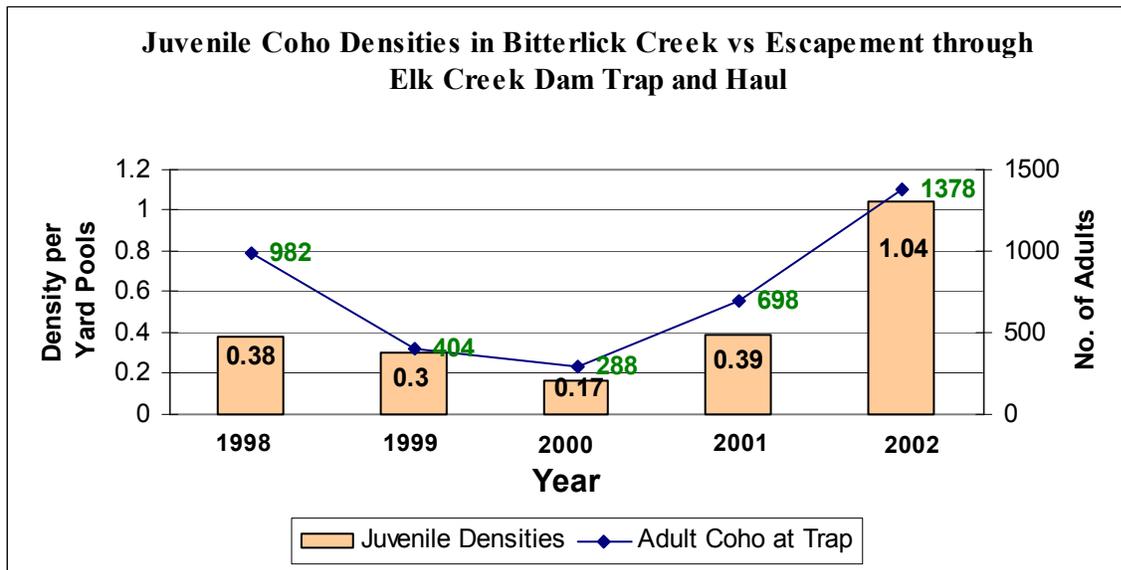
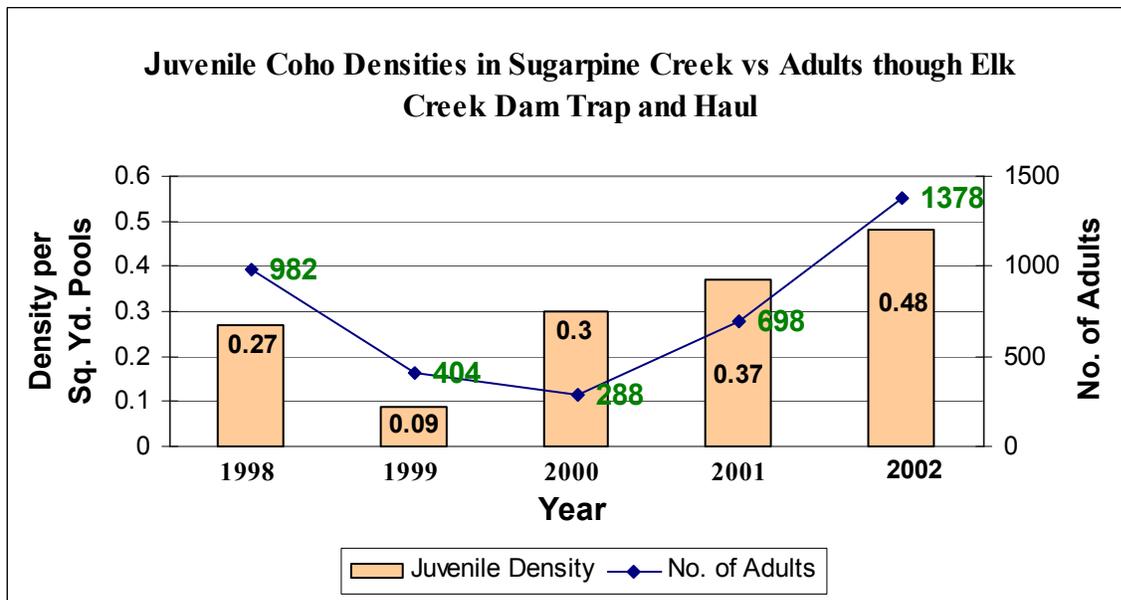


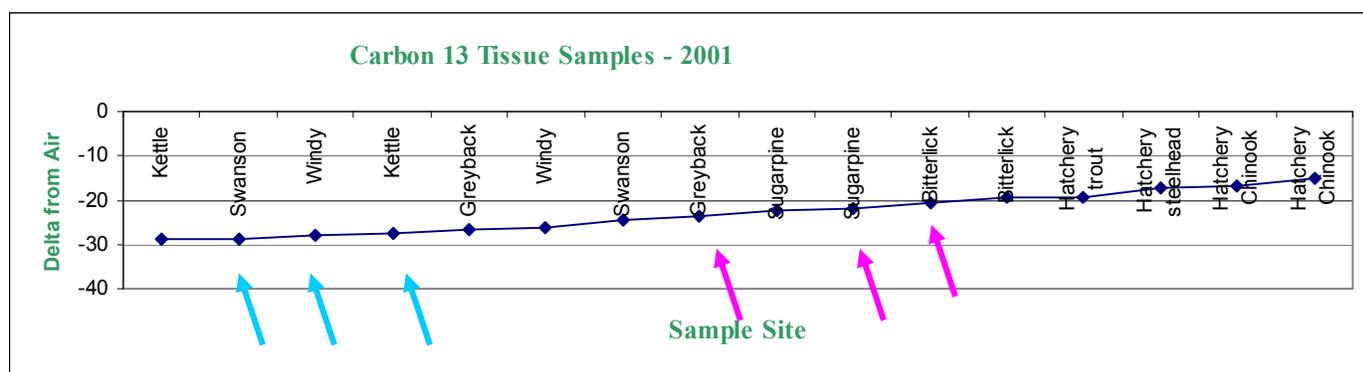
Figure 1-3. Sugarpine Creek: Total Adult Coho Spawner Escapement (Line) and Average Number of Juvenile Coho Salmon per Square Yard of the Surface Area of Pool Habitat the following summer (Bars).



Ocean Isotope Sampling

Figure 1-4 depicts the comparative quantities of Carbon 13 - an ocean-derived isotope - found in tissue samples of aquatic insects and fish from several paired drainages on the Forest. Bitterlick Creek, Sugarpine Creek, and Grayback Creek – all salmon streams – had higher Carbon 13 than trout-only streams within the same watershed. Hatchery-reared fish were used as a control as these fish are fed a diet high in ocean fish wastes that would test high for ocean-derived nutrients. Similar results were found in these paired streams when comparing the levels of Nitrogen 14 – another ocean-derived isotope used for such monitoring. Ocean derived nutrients have been traced from fish carcasses through trees in riparian forests and animals associated with anadromous fish streams and riparian areas. Salmon bring calcium, phosphorus, magnesium, nitrogen, potassium and other elements from the ocean in their bodies and these remain in the watersheds where they spawn and die. Research and studies of historical salmon runs indicate that a tremendous input of nutrients to local ecosystems results from massive salmon die offs after spawning. Coho salmon are the most widely distributed of the two salmon species due to their affinity for headwater streams and thus provide keystone nutrient benefits to flora and fauna.

Figure 1-4. Ocean-Derived Carbon 13. A graph of the presence of Carbon 13 in tissue samples of aquatic insects and fish found in paired drainages on the Rogue River–Siskiyou National Forest.



Streams with Salmon Present:
 Grayback, Sugarpine, and Bitterlick Creeks
Streams with Trout Only:
 Swanson, Windy, and Kettle Creeks

Salmon Spawning Surveys

Data from the three fish counting stations present within the Rogue River basin at Elk Creek trap & haul (Bitterlick and Sugarpine), Gold Ray, and Huntley Park (Beaver, Palmer, and Grayback), which estimate or count the number of coho salmon spawners, roughly parallels the Elk Creek Dam trap counts. Count records at Gold Ray dam date back to the early 1940's. During the fall and winter of 2004/05, a record year for coho escapement to the upper river occurred. The number of redds in the five survey reaches on National Forest System Lands (NFSL) in Figure 1-5 and Table 1-3, tends to proportionately parallel the total spawner counts at the counting stations. Coho adults are reaching spawning areas on NFSL in numbers proportionate to the overall salmon run size in the Rogue River basin as a whole. This is most apparent in Sugarpine Creek where spawning numbers are the highest per mile and track with local counts at the Elk Creek Trap and Haul well in Figure 1-6. Figures 1-2 and 1-3 illustrate that the number of juvenile coho present the following summer and tracks well with the overall salmon spawner numbers.

The Forest is currently undertaking a long term spawning survey program to track the return of spawning salmon adults to Forest stream reaches. Emphasis is placed on coho salmon because of the depressed population and listing of coho salmon as threatened under the Endangered Species Act in the SONCC Evolutionary Significant Unit. Coho salmon are a particularly important keystone species as spawners distribute widely into smaller tributaries throughout these watersheds. Coho salmon die after spawning, leaving ocean nutrients in the benthos community in headwater areas not reached by Chinook salmon. Steelhead trout often attempt to return to the ocean after spawning and do not often die in natal headwater streams. Pacific lamprey also can input large amounts of ocean nutrients to streams and populations are depressed.

Figure 1-5. Graphs of the five surveys reaches showing number of coho salmon redds observed.

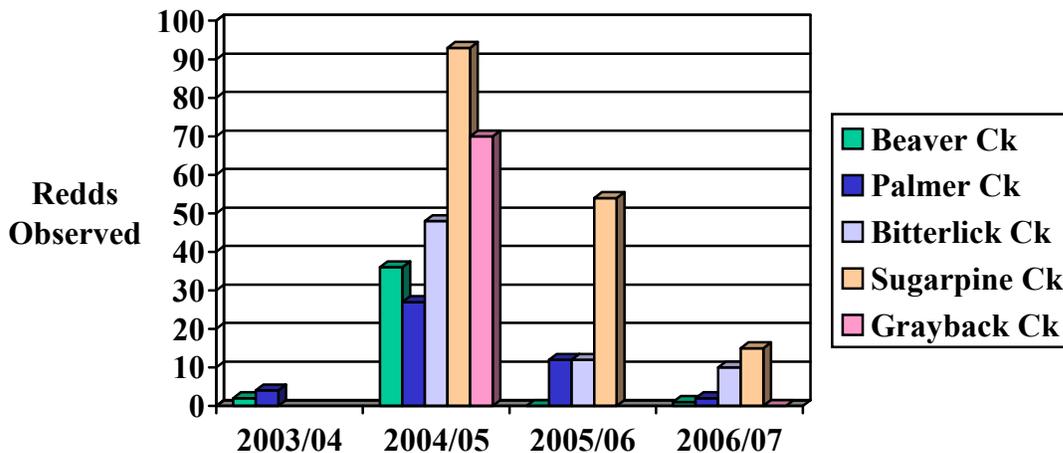


Figure 1-6. Sugarpine Creek: Comparison Graph of Total Coho Salmon Escapement (blue) Vs Number of Redds (pink) in Sugarpine Creek for 2005 to 2007 spawning years. Redd counts have been multiplied by the number 10 for better illustration.

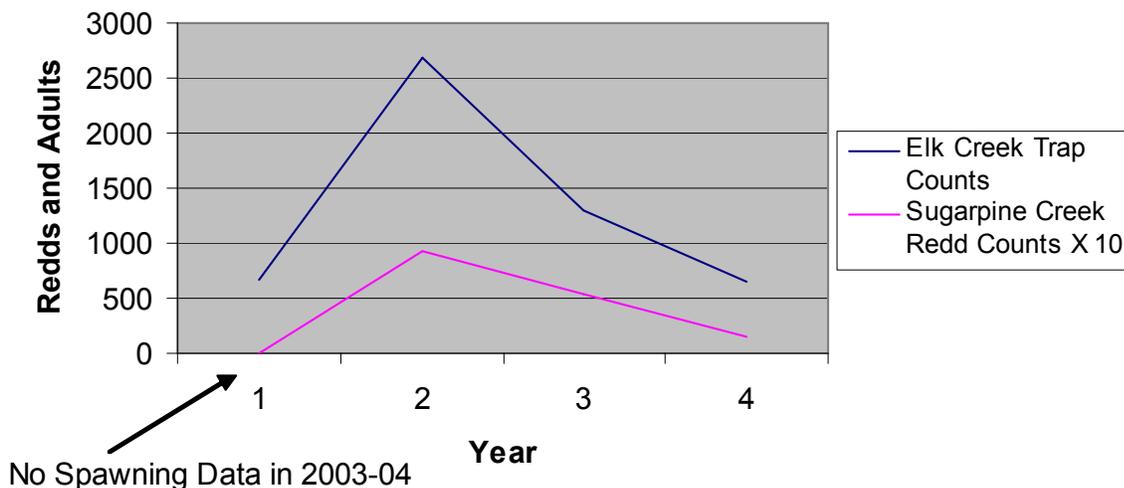


Table 1-3. Table of Coho Salmon Spawning Survey Results for Four Key Watershed Streams – Peak Counts

Stream	Coho Redds	Coho Adults/ Carcasses
Beaver Creek (0.8 miles)		
2003/04	2	0
2004/05	36	26
2005/06	0	0
2006/07	1	0
Palmer Creek (0.89 miles)		
2003/04	4	2
2004/05	27	14
2005/06	12	15
2006/07	2	0
Bitterlick Creek (1.5 miles)		
2003/04	No data	No data
2004/05	48	28
2005/06	12	9
2006/07	10	9
Sugarpine Creek (1.0 miles)		
2003/04	No data	No data
2004/05	93	106
2005/06	54	30
2006/07	15	17
Grayback Creek (1.5 miles)		
2003/04	No data	No data
2004/05	70	73
2005/06	No data	No data
2006/07	0	0

FINDINGS AND EVALUATION:

National Forest System Lands in the Rogue River and South Coast sub-basins play a crucial pathway in sustaining and recovering anadromous fish populations that have been depressed by environmental and anthropogenic influences. A common scenario in southwest Oregon watersheds is that habitat conditions deteriorate rapidly once streams flow off public lands. Water uses and land uses are often dedicated to maximizing production of agricultural goods on floodplains at the expense of the riparian forest and stream system. Water removal for irrigation use notably reduces available aquatic habitats. Water withdrawals also exacerbate elevated water temperatures during the summer months by increasing the effects of solar radiation on surface waters.

The Forest will continue conducting coho spawning surveys to track numbers of salmon using Forest streams to reproduce, as well as, provide the proportion of use compared with the total salmon run in the main stem Rogue River. These areas provide some of the best quality habitat for spawning and rearing on NFSL for coho salmon within the Rogue River Basin and are important focal areas for recovery of this population. Observations by fish biologists and stream survey data indicate that suitable habitat exists within reaches on public lands to accommodate increased numbers of juvenile coho for their freshwater life history.

Spawning surveys are used to observe where adults prefer to spawn within the streambed and stream reach and adaptive management can be employed to design instream habitat projects to best suit this fish species. Continuing these spawning surveys for a decade or more should provide useful data through the three to four year cycles that coho salmon escapement appear to follow in southwest Oregon. Biologists will be able to calculate the proportion of salmon populations that use National Forest stream reaches for spawning and rearing and better assess the importance of these stream reaches and watersheds in sustaining and recovering salmon populations.

RECOMMENDATIONS: Results are acceptable. Continue to monitor.

MONITORING ITEM: *LAND SUITABILITY*

GOAL(S), MONITORING QUESTION(S): The goal is to manage for timber resources only on lands where technology exists to assure regeneration success within a specified time period. This Monitoring Item is required by 36 CFR 219.27(c)(1). The monitoring questions are:

- **Are regeneration timber management activities confined to suitable lands?**
- **Are unsuitable lands properly classified? Has a change in technology affected suitability classification?**

FINDINGS, EVALUATION & RECOMMENDATION(S):

Rogue River National Forest

All timber sale harvest areas are routinely assessed for suitability for regeneration harvest. These assessments usually encounter slightly more area of unsuitable lands than was recognized in the 1990 Forest Plan. Regeneration harvest is not prescribed on lands that have been verified as unsuitable. Some adjustments were made to the land base in the first few years of Forest Plan implementation.

There have not been any adjustments made to the land base in the last 5 years (2002-2006). Amount of such lands are felt to be insignificant at this time, but these changes are being tracked and will be incorporated into Forest Plan revision. There has been no change in technology that has or would affect land suitability classifications.

Siskiyou National Forest

The 1989 Forest Plan has a threshold of 10,000 acres change in suitability classification for the first 10 years. Monitoring shows there are no changes beyond the threshold. The Northwest Forest Plan substantially reduced the land base for programmed timber harvest. It also adjusted the level of timber harvest for the Siskiyou National Forest (24 MMBF/year).

RECOMMENDATIONS: The overall finding is that results are acceptable, management direction is being achieved and current practices need to continue. There is a recommendation to incorporate the summation of land suitability changes at the end of the ten-year planning period or during Forest Plan revision.

MONITORING ITEM: *TIMBER OFFERED FOR SALE*

GOAL(S), MONITORING QUESTION(S): The goal is to manage for timber resources and long term harvest levels, as directed by the Forest Plan. This Monitoring Item is required by 36 CFR 219.12(k)(1). The Monitoring Question is:

- **Is the Forest offering the volume of chargeable and non-chargeable timber, as assumed in the Allowable Sale Quantity (ASQ) and the Timber Sale Program Quantity (TSPQ)?**

FINDINGS, EVALUATION & RECOMMENDATION(S):

Rogue River National Forest

Under the 1990 Land and Resource Management Plan, the TSPQ was 123.0 million board feet (MMBF) or 22.81 million cubic feet (MMCF) per year. Various factors associated with old-growth and late-successional habitat, court injunctions, lawsuits and new land management decisions (i.e., the Northwest Forest Plan) have changed the amount of timber offered for sale. Under the Northwest Forest Plan, 26 MMBF has been determined to be the Probable Sale Quantity (PSQ) for the Rogue River portion of the Rogue River-Siskiyou National Forest. The following table shows the timber offered for sale and harvested since 1990.

Table 1-4. Timber Volume Offered for Sale and Harvested: Rogue River National Forest

Fiscal Year	Volume Offered (MMBF)	Volume Harvested (MMBF)
1990	197.1	134.3
1991	52.4	95.4
1992	7.3	62.8
1993	10.5	61.2
1994	14.7	47.0
1995	26.3	28.8
1996	22.2	20.4
1997	25.1	30.5
1998	19.7	19.1
1999	2.6	11.1

Fiscal Year	Volume Offered (MMBF)	Volume Harvested (MMBF)
2000	0.6	10.6
2001	0.8	2.5
2002	6.4	14.0
2003	8.9	8.9
2004	0.3	8.0
2005	17.4	7.8
2006	19.1	4.0
Total	431.4	566.4
Average	25.4	33.3

Siskiyou National Forest

Under the 1989 Land and Resource Management Plan, the TSPQ was 160 million board feet (MMBF) or 28.4 million cubic feet (MMCF) per year. Various factors associated with old-growth and late-successional habitat, court injunctions, lawsuits and new land management decisions (i.e., the Northwest Forest Plan) have changed the amount of timber offered for sale. Under the Northwest Forest Plan, 24 MMBF has been determined to be the Probable Sale Quantity (PSQ) for the Siskiyou National Forest. The following table shows the timber offered for sale since 1990, in MMBF.

Table 1-5. Timber Volume Offered for Sale: Siskiyou National Forest

Fiscal Year	Volume Offered (MMBF)	Volume Harvested (MMBF)
1990	137	120.0
1991	58	63.0
1992	2	50.0
1993	3	11.0
1994	8	12.0
1995	16	17.0
1996	28	56.0
1997	28	37.0
1998	24	20.0
1999	18	26.0

Fiscal Year	Volume Offered (MMBF)	Volume Harvested (MMBF)
2000	1	13.0
2001	1.5	3.1
2002	14.3	1.3
2003	9.7	6.9
2004	72.2	18.9
2005	28.3	48.9
2006	27.8	23.3
Total	476.8	527.4
Average	28.0	31.0

Fiscal Year 2006 volume totals included a substantial salvage volume from the Biscuit Fire Recovery Project.

**Part Two:
Status of Implementation Activities associated with the Biscuit Fire Recovery Project**

The Biscuit Fire, located in southern Oregon and northern California, began on July 13, 2002, burned for 120 days, and reached 499,965 acres. Estimated to be one of Oregon's largest in recorded history, the Biscuit Fire encompassed most of the Kalmiopsis Wilderness. The boundary of the Biscuit Fire stretches from 10 miles east of the coastal community of Brookings, Oregon; south into northern California; east to the Illinois Valley; and north to within a few miles of the Rogue River.

The fire burned in a mosaic pattern; approximately 20% of the area burned lightly, with less than 25% of the vegetation killed. Another 50% of the area burned very hot, with more than 75% of the vegetation killed. The Rogue River-Siskiyou National Forest has been making progress re-building trails and recreation sites, restoring safe roads through the falling of dead (danger) trees along the transportation system, and reforesting burned lands. Sale of salvageable timber within the area burned by the Biscuit Fire was designed to support the economy and provide jobs for the surrounding communities, as well as potential funding to invest in restoration projects.

The Rogue River-Siskiyou Forest Supervisor signed three Records of Decision (RODs) in July 2004 for the Biscuit Fire Recovery Project, authorizing salvage sales, planting, creation of Fuel Management Zones (FMZs), meadow and savannah restoration, road closure, road stabilization, road maintenance, monitoring, and a landscape scale learning study. The RODs followed a draft and final Environmental Impact Statement (Biscuit EIS). The RODs were distinguished by the land management allocations within which these actions were authorized. One was for actions in Matrix lands, one for actions in Late-Successional Reserves (LSRs), and one for Inventoried Roadless Areas (IRAs).

This annual monitoring report includes the status of implementation activities associated with the Biscuit Fire Recovery Project. Presented below are the accomplishments to date, and planned implementation of projects and actions in the following categories:

1. Salvage Harvest of dead trees
2. Vegetation and Habitat Restoration. This includes the following activities:
 - a. Conifer planting
 - b. Site preparation for planting
 - c. Natural regeneration
 - d. Release to reduce vegetative competition
 - e. Wildlife habitat restoration
3. Roads and Water Quality Restoration. This includes the following activities:
 - a. Roads decommissioned/obliterated (miles)
 - b. Hydrology and soils restoration
 - c. Invasive Plant Management
4. Fuels Treatments and Habitat Restoration. This includes the following activities:
 - a. Creation of Fuel Management Zones.
 - b. Pre-commercial thinning for hazard reduction.
5. Landscape Scale Learning Study
 - a. Post Fire Ecology Monitoring

Biscuit Fire recovery activities continued throughout FY2006 and at this time, an update can be given for the planned activities remaining. Data for both accomplishments and planned activities and the scheduled timing of the completion was taken from the FACTS database (Forest Service Activities Tracking System) for the Forest.

1. Salvage Harvest

The following salvage sales have been completed as of the time of this report (September 2007). Actual volumes in thousand board feet (MBF) and actual receipts to the US Treasury are shown below.

		Volume Removed (MBF)	Stumpage Receipts
Hazard Tree Salvage Sales	Rasp Hazard	2,405	\$1,034,184
	Indigo Hazard	3,457	\$744,230
	Q-Camp Salvage	11	\$4,346
	River Six Hazard	2,331	\$328,772
	Baby Onion Hazard	2,444	\$393,988
	Bald Bear Hazard	4,269	\$360,823
	GameHorse Hazard	3,105	\$1,317,192
	Chetco Hazard	594	\$120,158
	Subtotal	18,616	\$4,303,693
Fireline log deck sales	North Deck Salvage	338	\$117,802
	South Deck Salvage	198	\$53,330
	Chetco Deck Salvage	3,186	\$10,416
	North End Deck II	101	\$21,659
	Buckskin Decks II	35	\$10,019
	Dasher Decks II	49	\$12,015
	Subtotal	3,908	\$225,241
Matrix Fire Salvage Sales	Briggs Cedar Fire Salvage	2,248	\$266,458
	Chetco Fire Salvage	217	\$3,134
	Flattop Fire Salvage	3,537	\$148,853
	Horse Fire Salvage	2,787	\$101,628
	Indi Fire Salvage	5,473	\$1,134,678
	Subtotal	14,262	\$1,654,750
LSR Fire Salvage Sales	Berry Fire Salvage	10,019	\$100,193
	Fiddler Fire Salvage	12,405	\$534,772
	Hobson Fire Salvage	3,544	\$28,350
	Lazy Fire Salvage	1,718	\$18,049
	McGuire Fire Salvage	866	\$34,994
	Steed Fire Salvage	5,633	\$58,939
	Wafer Fire Salvage	436	\$4,356
	Subtotal	34,620	\$779,652
IRA Fire Salvage Sales	Mike's Gulch Fire Salvage	2,327	\$68,320
	Blackberry Fire Salvage	16,432	\$3,076,728
	Subtotal	18,759	\$3,145,048
Salvage volume from Awarded Sales Burned by the Biscuit Fire	Two Wild TS	2,909	\$728,186
	Upper Chetco 95	667	\$182,823
	Subtotal	3,576	\$911,009
	Total	93,742	\$11,019,393

2. Vegetation and Habitat Restoration

2a. Conifer Planting

Reforestation efforts continue, though reduced from the planned planting reported to the House and Senate Committees on Appropriations in 2006 (Statement 4 in the report).

Planting Year	Reasonable Estimate of Reforestation Schedule Updated Spring 2007	Acres Actually Planted
2003	200	691
2004	4,800	4,658
2005	5,000	4,112
2006	10,000	1,282
2007	2,034	
2008	584	
2009	395	

The following shows types of reforestation actions (actual and planned) by fiscal year:

- 2003 – Planting of burned plantations; seedlings from neighboring landowners.
- 2004 – Planting burned plantations that did not need site preparation.
- 2005 – Planting burned plantations that needed site preparation, salvage sale areas, and some of the “other” planting areas (landscape planting and planting in landscape burn areas).
- 2006 – Planting salvage sale areas
- 2007 – Planned planting salvage sale areas
- 2008 – Planned plant/replant salvage sale areas
- 2009 – Planned for any replanting of poorly stocked salvage sale areas

Estimate of planned planting of burned plantations has been dramatically reduced due to the natural regeneration seen within the units. Surveys to formally account for this natural regeneration of the Biscuit Fire area have not yet been accomplished, but are planned for FY 2007 through FY 2009. Planting costs generally are estimated at an average \$550/acre (walk-in units with no road access are higher).

2b. Site Preparation

Site preparation accomplished in FY 2006 was associated with felling dense areas of dead small trees to allow for planting.

Site Preparation	FY 2006	234 acres
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Site preparation for out-year planting remains only for a few of the salvage sales that closed late in FY 2006.

Planned site preparation acres:

FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
214 acres	120 acres	---	----	---	---

2c. Natural Regeneration

Natural regeneration has been successful in bringing back a vegetative cover for the forest. Formal surveys are still planned for the future to assess the actual stocking numbers per acre, distribution, and species. Even with natural regeneration, artificial reforestation may be required in selected areas to insure restoration of minor species such as sugar pine, ponderosa pine, and Port-Orford cedar on the landscape. Natural regeneration acres planned:

FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
60 acres	938 acres; Need additional funding (\$40,612) to accomplish a total of 2,500 acres	76 acres; Need additional funding (\$65,545) to accomplish a total of 2,500 acres	Need additional funding (\$70,304) to accomplish planned 2,500 acres	Need additional funding (\$73,116) to accomplish planned 2,500 acres	Need additional funding (\$76,041) to accomplish planned 2,500 acres

2d. Release

Release and weeding activities enhance the growing conditions for natural and planted trees, reduce vegetative competition, and assist with stand development.

Release	FY 2006	40 acres
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FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
177 acres	---	105 acres	----	47 acres	---

2e. Wildlife Habitat Restoration

Seeding & Planting for Wildlife Habitat Enhancement	FY 2006	0 acres
Rehab opening with Wildlife Habitat	FY 2006	0 acres
Wildlife Nest Structure Development	FY 2006	0 acres
Monitor Wildlife Habitat	FY 2006	0 acres

Planned Wildlife Habitat activities:

Seeding and planting for wildlife habitat development or enhancement:

FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
270 acres	90 acres	----	----	---	---

Maintenance of wildlife habitat:

FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
803 acres	318 acres	760 acres	----	---	---

Wildlife nest structure development:

FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
160 acres	---	----	----	---	---

Rehabilitate openings for wildlife habitat:

FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
2 acres	756 acres	370 acres	----	---	---

3. Roads and Water Quality Restoration

3a. Roads Decommissioned/obliterated

Road Closure	FY 2006	0 miles
Road Obliteration	FY 2006	0 miles

Planned activities to manage the transportation system are:

Road closure:

FY 2007	FY2008	FY 2009	FY2010	FY 2011	FY 2012
23 miles	---	---	----	---	---

Road obliteration:

FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
19 miles	---	---	----	---	---

3b. Hydrology and Soil Restoration

Activities to minimize erosion and sediment transport as well as maintain or restore soil productivity have been accomplished in prior years or have been considered unnecessary for recovery of the burned area.

Erosion control	FY 2006	0 acres
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Planned activities to minimize erosion and sediment transport:

FY2 007	FY 2008	FY 2009	FY2010	FY 2011	FY 2012
24 acres	---	---	----	---	---

3c. Invasive Plant Management

The treatment of invasive plants and the monitoring of their presence is of high concern within the Biscuit Fire area.

Noxious Weed Treatment & Monitoring	FY 2006	452 acres
------------------------------------------------	---------	-----------

Planned noxious weed treatments:

FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
650 acres	650 acres	648 acres	646 acres	74 acres	---

Planned noxious weed monitoring:

FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
650 acres	650 acres	648 acres	646 acres	328 acres	---

4. Fuels Treatments and Habitat Restoration

4a. Creation of Fuel Management Zones

Fuels management activities include development of Fuel Management Zones or fuel breaks and prescribed burning for site preparation. The acres of prescribed burning for site prep are included in the site preparation acres above.

Fuels Management	FY 2006	0 acres
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Planned development of a Fuels Management Zone (FMZ):

FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
300 acres	---	---	----	---	---

4b. Pre-commercial Thinning for Hazard Reduction

Pre-commercial Thinning	FY 2006	40 acres
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FY 2007	FY 2008	FY 2009	FY2010	FY2011	FY 2012
5,334 acres	---	---	----	---	---

The planned pre-commercial thinning scheduled is in association with the Bald Bear Hazard area.

5. Landscape Scale Learning Study

The Forest Service has sought support for an applied research and learning project that may serve as a template for other projects supported by the U.S. Endowment for Forestry & Communities, Inc. This project's founding partners are the Forest Service's Pacific Northwest Research Station, Pacific Northwest Region, and Rogue River Siskiyou National Forest, and Oregon Websites and Watersheds (an educational nonprofit 501c organization). The goal is to monitor the landscape experiment implemented by the Rogue River Siskiyou National Forest (harvest completed in 2006). The experiment was designed by Research Station scientists and the Forest interdisciplinary team, and was fully peer reviewed by the Research Station (Appendix A of the Biscuit Fire Recovery project EIS; Bormann et al. 2004). This project would monitor and report on the experiment in a way that benefits, local, regional, and national communities. This project is the second implementation of a management experiment as developed under the general concept of options forestry (Bormann and Kiester 2004).

Specific objectives are to:

- Compare on the ground—by using sound scientific methods—replicated alternative management strategies to managing federal lands after wildfire, at a fully operational scale (36,000 acres). This management experiment is a way to examine the environmental and societal effects of active post-fire intervention in support of jobs, and institutional and industrial infrastructure; of passive management in support of ecological processes; and underburning as a means of reducing fire-risks and more likely reflecting historical conditions. The three strategies (see fig. 1) are:

- Harvesting commercially viable stands of trees killed in the wildfire, planting, and actively and managing vegetation to speed the return of large conifers
- Allowing ecological processes to unfold with little intervention; and
- Commercially harvesting dead trees, reducing fuels, and reintroducing low-intensity fire.
- Encourage the broadest possible participation in the entire learning process through extensive web-based methods with peer-reviewed content, and as-yet-undetermined local participation.
- Provide a template—including a peer-reviewed study plan—that could be applied on other wildfires, other ownerships, and even other questions.

To accomplish these objectives, the project would include these tasks:

- 1) Collect environmental, past-management, economic, and institutional baseline information and set up a long-term monitoring database;
- 2) Collect and synthesize historical data, including Government Land Office records, Native American fire-use, and historic photos, as a basis for implementing future underburning given current conditions, and to establish historical covariates for all analyses;
- 3) Rerun remote sensing (aerial photos and lidar satellite imagery) in 2007 to document treatment actions and background changes (\$70,000 invested by the Research Station in 2004 lidar; \$40,000 from the Regional Office is planned in 2007);
- 4) Select comparable stands in the logged and un-logged treatment areas—to rigorously determine the effect of post-fire harvesting at the stand scale;
- 5) Layout and measure permanent plots with standard Forest vegetation surveys;
- 6) Develop and implement an approach to getting the public to directly participate in the study, provide photo points, and grant access to all aspects of the study as it unfolds on a web page;
- 7) Engineer the broadest possible debate, focused on respecting diverse views and documenting expected outcomes of the treatments using existing evidence, models, and even opinions;
- 8) Offer regular workshops and field-trips to show the results and allow people to form their own conclusions;
- 9) Analyze data at the stand and landscape scales to determine the influence of management on the environment and society; and
- 10) Provide science-based evidence in forms useable to K-12, web users, managers, and policy makers, and publish peer-reviewed journal papers for the scientific record.

Citations

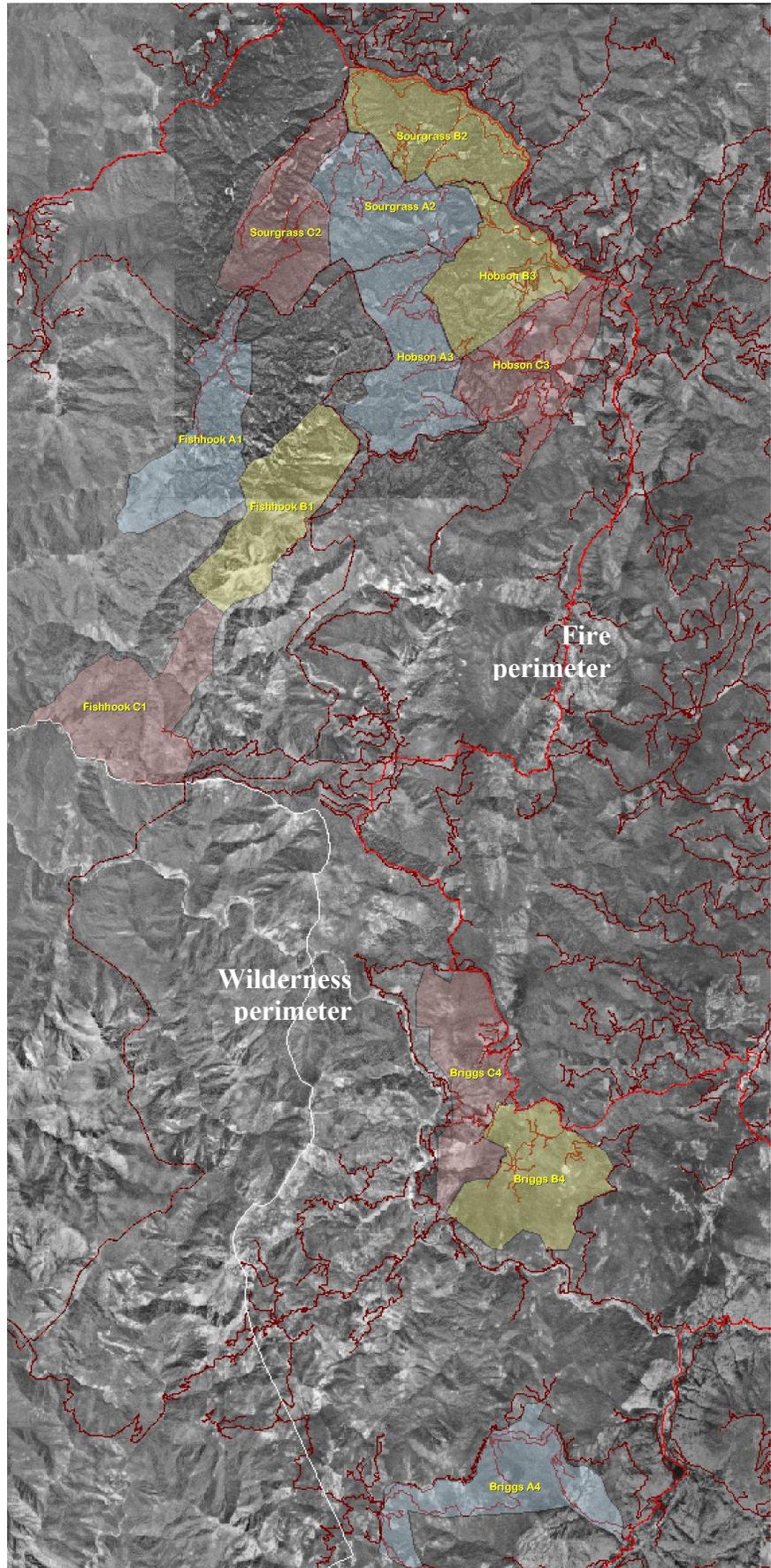
Bormann, BT, and AR Kiester. 2004. Options forestry: acting on uncertainty. *Journal of Forestry* 102: 22-27.

Bormann, BT, RL Darbyshire, RC Miller, DV Delack, DE White, TK Link, R Phillips, and R Fairbanks. 2004. Appendix A: Plan for a landscape management experiment on restoring late successional forest habitat after the Biscuit Fire. In, *Biscuit Fire EIS, Rogue River Siskiyou National Forest, Medford, OR.*

Figure 2-1. The landscape-scale management experiment implemented on the eastern half of the Biscuit Fire area, comparing 3 management strategies, each replicated 4 times and randomly allocated. Each landscape area is about 3000 acres; the total study includes 36,000 acres.

KEY

- A. Salvage and replant** (represented by a blue box)
- B. Natural recovery** (represented by a yellow box)
- C. Underburning focus** (represented by a pink box)



5a. Post Biscuit and Tiller Complex Fire Ecology Monitoring

The Ecology Program had established permanent plots in the Biscuit and Tiller fires about 10 years prior to the fires in 2002. The fires included 102 of these plots, 83 in Biscuit and 19 in Tiller, which provided an opportunity to measure vegetation changes after wildfires. These plots were reestablished and re-measured post-fire in 2006, as part of the ongoing Rogue River-Siskiyou NF ecology monitoring program. Pre and post fire base-line data have now been collected and established. It is anticipated that subsequent re-measurements will occur at periodic increments.

Post-Fire Ecological Attributes Being Monitored

- ▶ Down Wood
- ▶ Post Fire Vegetation Response
- ▶ Soil Exposure, Litter and Moss
- ▶ Tree growth
- ▶ Regeneration
- ▶ Snag Retention
- ▶ Vegetation Reestablishment

The ecology plots were initially installed between 1985 and 1991 on Forest Service forested lands. They were distributed throughout Southwestern Oregon so that most of the vegetation diversity was represented. The initial data were used for the southwestern Oregon plant classification (“Field Guide to the Forested Plant Associations of Southwestern Oregon”). The burned plots will now monitor the effects of the Biscuit and Tiller Complex Fires measured one (2003) and three (2005) years after the fires.

In 2003, each of the 102 burned plots were assigned a fire severity rating of high, moderate, low or none, based on the amount of vegetation burned. High severity corresponded to stand replacement fire with at least 80 percent of the overstory canopy removed. Low severity fire had no impact on the overstory and reduced shrub cover and herbs by 50 percent or less. The moderate rating fell intermediate between high and low. At the time of the 2005 measurements, eight of the plots were found to have been salvage logged. Within each plot, the percent cover of six soil surface variables was estimated for approximately a one-fifth acre area. These variables were litter, moss, bare ground, gravel, rock and bedrock. The number of stems of each hardwood and conifer tree species was recorded

Down wood data were collected by installing three-70 foot (slope corrected) transects with the segments crossing the area in different directions. The down wood transects were placed as close as could be determined to the original location. In the 2005 sampling period, each piece of down wood was tagged and numbered so that individual pieces can be followed through future time.

Part Three: Special Inventory and Monitoring Projects for FY 2006

The following includes a report of observations and findings from special inventory and monitoring efforts on the Rogue River-Siskiyou National Forest. These reports cover a period from mid-summer 2005, through mid summer of 2006.

Bald Eagle Monitoring

Summary of Bald Eagle Monitoring at Applegate Reservoir (Siskiyou Mountains RD)

The bald eagle pair known from Applegate Reservoir produced one chick during the 2006 breeding season. This was the first successful breeding season since 1997. The nest is located on the east ridge of the lake and has been monitored since 1988. During that time, the bald eagle pair has successfully fledged young during the following years: 1988, 1989, and 1992-1996. In 2002, the pair was on the nest from April through mid May, but was not seen after that time in or around the nest.

For 2006, eagles were first seen on the nest on March 21st. By April 18th, one adult eagle was observed walking around the edge of the nest as if feeding young. The first sighting of a chick was on May 9, 2006. Offspring are difficult to see prior to this time due to the size, depth and distance of the nest from the observation point. The chick was visible and active in the nest by May 30th, and one adult eagle was observed on the nest on June 12th. The eagles were not seen again until July 18, 2006 when a pair of adults (no immature) were seen soaring over the east ridge of the lake.

Typically, the eagles at the lake begin incubation during early March, feeding young is observed in April, chicks are sighted in May, and the young fledge during late June through mid July. Observations during this nesting season seem to conform to this schedule.

During the midwinter eagle survey in January, one bald eagle and two golden eagles were recorded near the lake. In addition, on April 16th two bald eagles and one immature eagle were soaring over the Applegate River approximately three miles west of Ruch. There were four sightings along this stretch of the river in 2005 during the breeding season; the pair could be nesting in this region. Monitoring the eagles at the lake will continue during the early fall to document all activities of the eagles and especially the immature eagle hatched this year.

Summary of Bald Eagle Monitoring on the Lower Rogue River (Gold Beach RD)

One winter bald eagle survey on the lower Rogue River was completed in January. One adult was sighted.

Libby Creek Nest Site (nest tree on BLM) was surveyed 8 times between 10 March and 6 July. One young produced.

Watson Creek Territory was surveyed 8 times between 10 March and 30 June. One young was produced in a new nest tree.

Quosatana Creek Area was surveyed 6 times between 10 March and 4 July. Status is unknown. Adult birds were observed early and late in the nesting season. Additional surveys are needed during the nesting period to determine where or if they are nesting in this area.

Blue Jay Creek (Agness Area) was surveyed 3 times between 10 March and 5 June. Nesting behavior was observed, but limited searching did not locate a nest.

Sensitive Species Monitoring

Peregrine Falcon (Gold Beach RD)

This year is one of the USFWS de-listing monitoring years for Agness and Marial territories. Agness Territory was surveyed 7 times between 5 April and 14 June. Two young were produced.

Marial Territory was surveyed 6 times between 10 March and end of May. At least one young was produced.

Bradford Territory (a new territory) was located this year by Frank Isaacs. It was surveyed 6 times between 5 April and 8 June. At least 2 young were produced.

Mardon Skipper (High Cascades RD)

The Mardon skipper (*Polites mardon*) is a Federal candidate species for listing under the Endangered Species Act (ESA). The Mardon skipper is a Forest Service Region 6 Sensitive species and a BLM Special Status Species.

The Mardon skipper is a small, tawny-orange butterfly currently found at only four geographically disjunct areas in northwest California, southwest Oregon, the southern Washington Cascades, and one population in the south Puget Sound region of western Washington. Seventy-three populations/sites are currently known from these four areas.

Mardon skippers are grassland dependent and appear to have narrow habitat requirements at least in some portions of their range. In the southern Washington Cascades they seem to be restricted to fescue dominated meadows with adequate nectar sources for adults.



Three Mardon skipper sites on Forest Service lands were visited twice at the start of the 2006 flying season. No skippers were located during the late May visit but all sites had butterflies present by June 10. This places the early date for flight between May 27 and June 10, though it was a heavy snow winter so flight may have been delayed. In addition several prospective sites were surveyed by Forest Service personnel and contractors north of Highway 140. No Mardon skippers were located at

these sites. Contract surveyors did locate a new site near the intersection of Dead Indian Memorial Highway and FSR 37. For more information, contact Norman M. Barrett, Wildlife Biologist, 541-560-3479.

Western Pond Turtle

Two systematic surveys for western pond turtle were done: June 26-30 (Grave Creek to Foster Bar) and July 5th (Illahe boat launch to Burns Creek pond). The June survey generated 71 detections of which 6 adults (2 males, 4 females) were captured (including a recapture); one recent mortality was detected. The recapture, #137, is an adult female and she was within 100 feet of where originally caught in July 2005. The recapture is particularly important as it further affirms a high degree of site tenacity and adds to the life estimates for turtles in this system. The size and condition of the turtles was consistent with prior year's findings. The condition of two of the turtles is noteworthy. One location was a gravid female. This was the first one since 2002. Observation of this gravid turtle is a good indicator that the turtles are likely ovipositing before mid-July, perhaps mid-June.

The other interesting condition was that of a large male rather heavily afflicted by leeches along its right - posterior - ventral area. Leeches are infrequently seen on turtles. These leeches were securely attached and their removal would have taken substantial effort.

The July survey focused on Burns Creek pond but opportunity monitoring was conducted enroute. Survey conditions were problematic as high cloud cover developed. Only two turtles were detected and none were evident at Burns Creek pond which was the target monitoring site. The low detection rate supports the contention that overcast conditions result in low levels of surface turtle activity. It is suspected that the turtles are laying on the stream floor and only surfacing occasionally for oxygen.

Foothill Yellow-legged Frog

During the FY 2006 field season, approximately 3 ½ miles of Rock Creek was surveyed for reptile and amphibian species. Approximately 12 miles of the lower and upper South Fork Coquille River were surveyed for reptile and amphibian species. Foothill yellow-legged frogs were the only Sensitive species found during these surveys. Three sites with multiple egg masses each were located and recorded during the surveys, along with numerous adults and juveniles. Locations and additional information were entered into the Fauna database.

Beaver and Palmer Creek Riparian Thinning Siskiyou Mountains Ranger District

The principal objective of riparian thinning is to reduce crowding of dense young forest stands to accelerate tree growth for shade and large wood contribution. Riparian areas adjacent to two streams within the Applegate River - McKee Bridge watershed were thinned. Both streams contain coho salmon and summer and winter steelhead as well as trout and other non-salmonid species of fish.

Thinning was done by a contracted crew experienced in pre-commercial thinning. The prescription called for leaving hardwoods and promoting tree diversity, including shrubs. Trees were moderately thinned so as to not increase solar radiation on surface waters and cause warming. The stands will need another thinning in about 10 to 15 years to nurture the riparian forest. For more information, contact Susan Maiyo (541)552-2913.



Figure 3-2. Dense Forest Before Thinning Project



Figure 3-3. Riparian Forest Stand after Thinning

Riparian Thinning in Upper Elk Creek High Cascades Ranger District

The Elk Creek watershed experienced a large fire in 2002 mostly on BLM and private lands. Fire behavior changed radically when the fire moved east to National Forest lands, against the east winds at the time. It was noted that large trees with less understory fared best during extreme fire weather conditions. To secure important riparian areas adjacent to salmon streams, pre-commercial thinning has been ongoing to reduce fuels and release hardwoods and conifers in the riparian zones of Bitterlick Creek and Sugarpine Creek. Both streams have good runs of coho salmon and summer and winter steelhead.

Thinning work was contracted and excess materials generated by thinning were handpiled. Spacing was conservative as the stand left after thinning in riparian zones was deemed to be more dense than typical upslope forest stands. The forest was opened up moderately by this work so that shade of surface waters would not be decreased. For more information, contact Jeff Vonkienast (541) 560-3440



Figure 3-4. Surgarpine Creek Riparian Forest Before Thinning



Figure 3-5. Post Thinning Riparian Forest

South Fork Coquille Riparian Treatments Powers Ranger District

The objective of riparian treatments is to enhance and restore aquatic ecosystems to a healthy and productive state. Treatments include implementation of in-stream projects such as tree lining to improve aquatic habitats and to establish and release conifers within managed portions of the Riparian Reserves along anadromous and inland fish bearing streams. Projects will provide for and facilitate the recovery of Riparian Reserves as directed by the Northwest Forest Plan. Projects will provide for future large woody material, critical shade, nutrients, bank stability.

One aspect of treatments utilized materials on site by pulling over and/or utilizing down large conifers for in-stream placement. Potential habitat trees are sound snags, broken tops, or trees that are a potential human hazard. The project intent is not to utilize trees that are of high shade value. The end result is an increase in natural looking aquatic habitat.

Another treatment was riparian thinning of conifers within the Riparian Reserves. Conifers were released with hand tools as well as mechanical means (chain saws). Western Red Cedar and Douglas-fir were favored over Red Alder to facilitate functional recovery of the Riparian Reserve, where appropriate. In areas that lacked the diversity of a conifer/hardwood mix, conifers were planted using conventional means.

Large woody material slows down floodwaters allowing gravel to accumulate, creates pool habitat and provides hiding cover for fish, maintains stream diversity, and provides nutrients. Improvement of in-stream conditions will benefit aquatic species; especially coho, Chinook salmon, steelhead, coastal cutthroat trout and Pacific lamprey. For more information, contact Steve Namitz 541-439-6250.



Figure 3-5. Tree Lining Machine



Figure 3-7. Tree Lining



Figure 3-8. Riparian Thinning



Figure 3-9. Riparian Thinning

Black-backed Woodpecker Habitat Improvement High Cascades Ranger District

The two main objectives for this project were to enhance habitat for black-backed woodpeckers while reducing fuels around the Thousand Springs Snowmobile Park and Highway 62 on the **Prospect Ranger District**. This area is a nationally known location for birders interested in observing black-backed woodpeckers.

The treatments were designed to improve the quality of the existing habitat and to expand the available acres of suitable nesting habitat. This included reduction of potential intensity, duration, and rate of spread of fire in a fire prone area by thinning “doghaired” (extremely dense) lodgepole pine trees and reducing ladder fuels. The project was designed to maintain open lodgepole pine habitat with some mixed conifer to promote species diversity for long term ecosystem resilience and restore structural diversity. The project was also designed to improve recreational opportunities, including bird watching, during the summer.

Initial implementation monitoring of this project found the density of the 70 acre stand was reduced to 70-200 trees per acre, dependant on the species by applying pre-commercial thinning, and slash treatment. Currently, 15 acres have been completed through firewood and post-and-pole sales. Felled trees will be used as firewood for the snowpark shelter, commercial or non-commercial sale, or donated to needy people in the Prospect area. Lodgepole pine trees left after thinning are the ones that best meet the needs of Black-backed woodpeckers for cavity nesting, based on size and health.

The treatment would leave Douglas-fir and white pine when available. Lodgepole pine would be left over the top of the young trees of other species to help protect from frost. Ground fuels were reduced by removing, chipping, hand piling, or arranging fuels to reduce flammability.



Figure 3-10. Black-backed Woodpeckers Nest in Open Lodgepole

15 acres were treated in 2005. A nest was in the portion treated in 2005. The final 55 acres thinned in 2006. Much of the slash has been chipped to harden ATV and snowmobile trails. The remaining slash is piled and will be burned in the spring. For more information, contact Norman Barrett 541-560-3479.



Figure 3-11. Example of treated Stand

Meadow Restoration - Big Game Enhancement Powers Ranger District

The objective of meadow treatments is to restore and enhance big game habitats that are currently being lost to encroachment. Aerial photos were utilized to determine historical conditions. Tree boring to determine age classes and stand structure was also utilized.

Methods being utilized for meadow restoration include the removal of encroaching conifer by mechanical means, girdling larger trees, and burning decadent grass and fuels layers to promote vigor and new growth of vegetation within the meadow.

Expected results include moving meadow structures from current conditions to conditions seen on aerial photos pre 1940s. In these photos, meadow components were already being lost to conifer encroachment and fire suppression. One of the goals of this project is to put the meadows on a maintenance burn plan. Fire is needed to stimulate vegetation vigor and growth, reduce decadent grasses and shrubs, terminate small encroaching conifers, and promote over all meadow health. For more information, contact John Lowe 541-439-6251.



Figure 3-12. Meadow Seeding

Spawning Surveys and Juvenile Census Siskiyou Mountains Ranger District

Spawning surveys are done for coho salmon and winter and summer steelhead to supplement and complement other surveys done by the State and Watershed Councils. Data is used to compare adult salmon escapement between years and against surveys for juvenile fish during the summer.

Stream survey Level III surveys (fish habitat enhancement pre/post surveys on the Little Applegate River) followed protocol, coho and steelhead spawning surveys (South Fork Little Butte Creek, Little Applegate River, Beaver Creek, and Palmer Creek) and fish presence/absence surveys (Little Applegate River).

Summaries of the data were being completed during the fall of 2006. Data has been compiled in a database and shared with watershed councils, BLM, and ODFW. A compilation of all past monitoring/surveying by the above agencies is currently being undertaken for information sharing and watershed restoration planning. The Applegate River-McKee Bridge 5th Field Watershed Aquatic Restoration plan was completed with interagency review. This plan will be utilized in prioritizing future projects and monies toward the restoration of the watershed. For more information, Susan Maiyo (541) 552-2913.

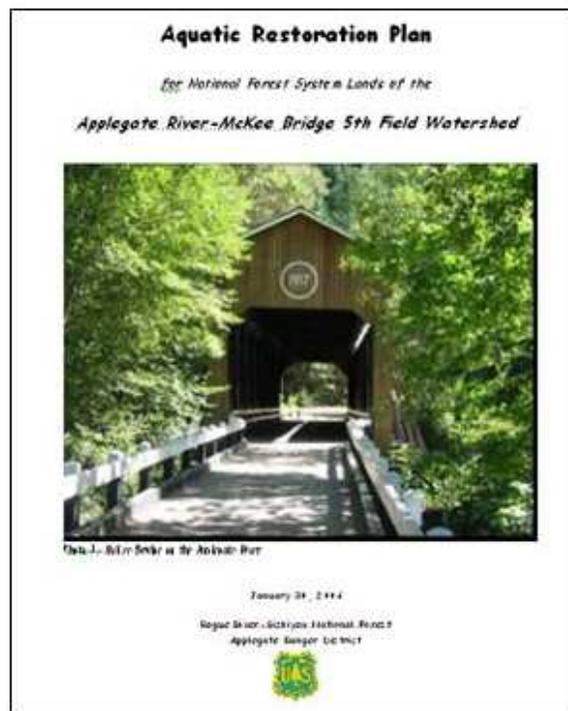


Figure 3-13. Restoration Plan Cover for Applegate - McKee

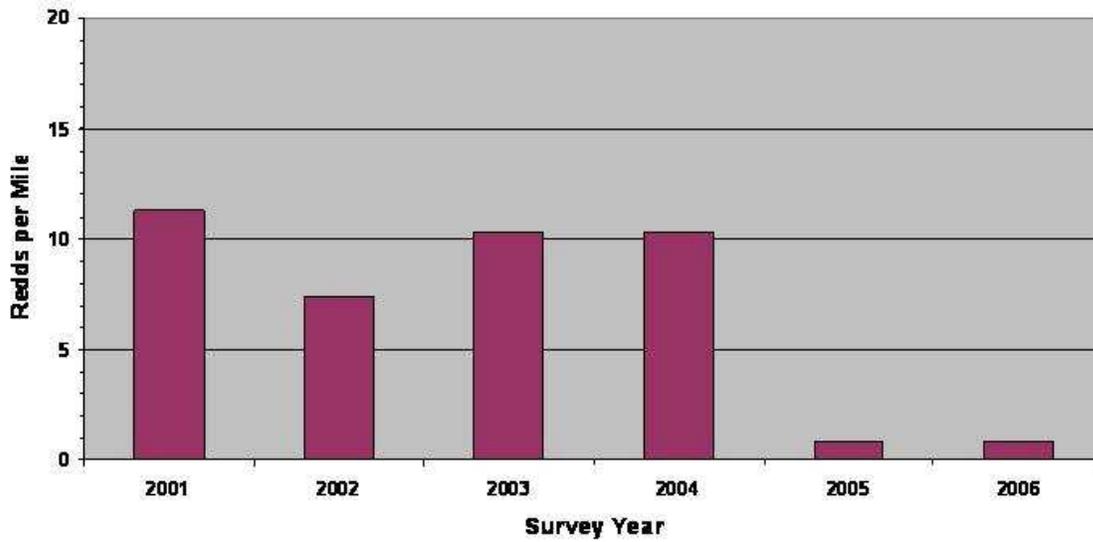


Figure 3-14. 2001-2006 Steelhead Surveys - Little Butte Creek

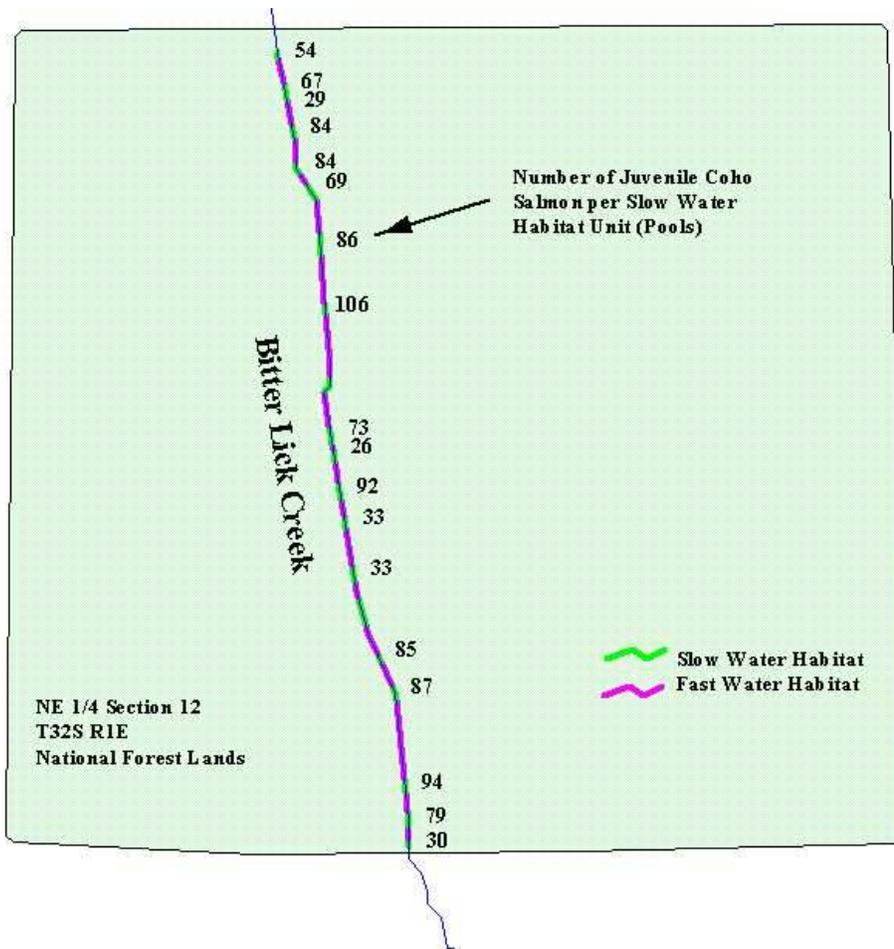


Figure 3-15. Juvenile Coho Counts in Pools

Steelhead and Coho Spawning Surveys High Cascades Ranger District

Annual spawning surveys for coho salmon and steelhead are conducted each year to determine relative escapement to spawning beds on National Forest lands. Spawning surveys are conducted no more than 10 days apart for coho salmon to arrive at a redd and adult count in a given reach of stream. Bitterlick Creek and Sugarpine Creek, each approximately 10,000 acre sub-watersheds at the survey reach within the Elk Creek key watershed, were surveyed. Steelhead trout redds have been surveyed in Bitterlick Creek and Sugarpine Creek on a single-pass basis for 6 years.

In Sugarpine Creek, 45 coho salmon redds were observed in a survey reach of approximately one mile. In Bitterlick Creek 24 salmon redds were observed in a survey reach of approximately 1.5 miles. During the peak of spawning about the same number of live adults was seen as the number of redds. The redd density per mile was about 50 redds per mile for Sugarpine Creek and about 15 redds per mile for Bitterlick Creek. For more information, contact Randy Frick (541) 858-2270 or Jeff VonKienast (541)560-3440

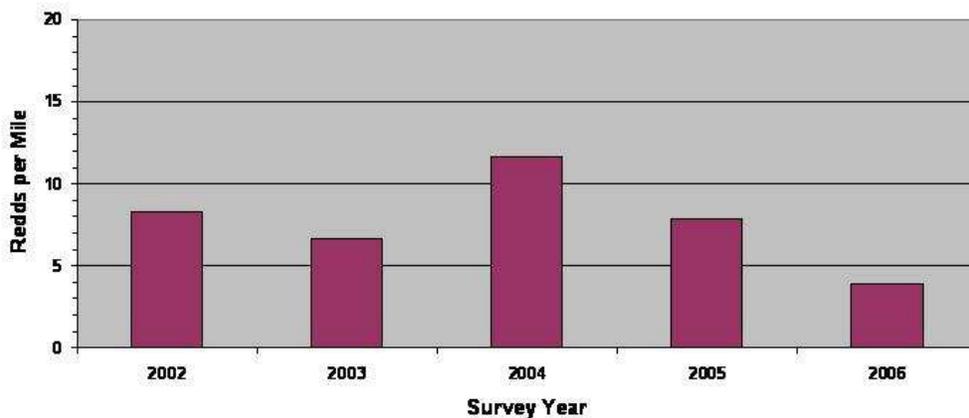


Figure 3-16. Annual Spawning Results in Bitterlick Creek

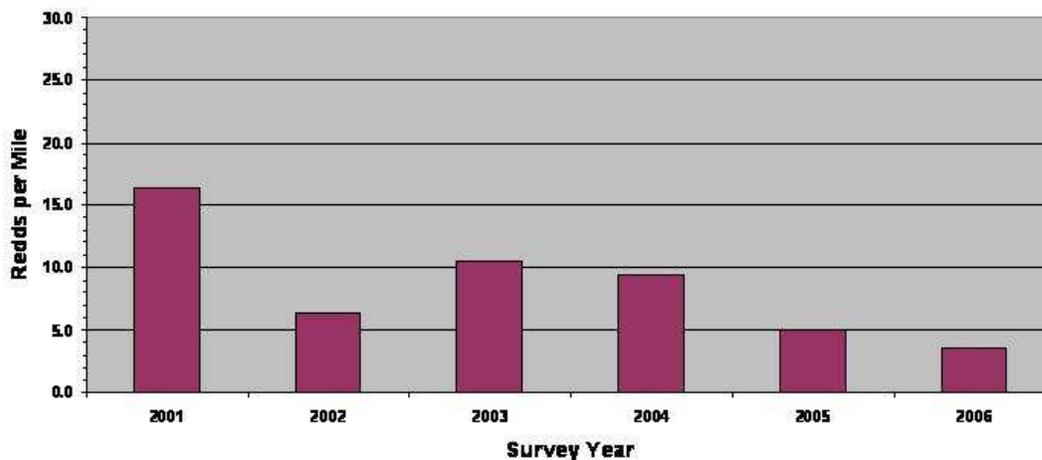


Figure 3-7 Annual Spawning Results in Sugarpine Creek

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