Appendix D

Monitoring

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Introduction

This monitoring plan is tiered to and developed from the recommendations in the Fremont National Forest Land and Resource Management Plan (Forest Plan) (1989). Generally, the effects to be measured correspond to those described and listed in Chapter 2, Table 2.xx.

While Forest Plan monitoring does not necessarily assess all aspects of individual projects, some aspects of this proposal, if implemented, would be included under various Forest Plan Monitoring items, along with other similar activities on the Forest. The Forest prepares an annual Monitoring and Evaluation Report to document the results.

Project Monitoring

This project monitoring will be followed if Alternative C, D, E, G, or H is selected. The plan focuses primarily on "implementation monitoring" to assure the alternatives and mitigations are implemented on the ground as designed and achieve the desired results. More importantly, it is designed wherever possible to catch and assess problems before or when they occur so corrective actions can be taken. As such, it is also a quality control / quality assurance plan.

By its nature, implementation monitoring, to be effective, requires an adaptive approach to management. That means when undesirable or unexpected results or conditions are identified through monitoring, the project will be assessed and altered as needed to meet the intent of the mitigation or proposed activity. This is explicitly described in some activities (1.e. if new heritage sites or sensitive plants are identified, unit boundaries or treatment types will be modified as necessary to protect the resource) but is also implicit for the project as a whole. If or when these situations arise, project adjustments will be made on the basis of the desired and predicted outcomes discussed in this DEIS.

Several monitoring items are intended to measure and evaluate the effectiveness of specific practices proposed in these alternatives. This effectiveness monitoring provides useful information to determine whether these practices should be use, or modified for use in the future.

This monitoring is discussed in two parts. The first briefly introduces established monitoring and quality control procedures used in project development, design, contract preparation, and project administration. This is only summarized here, as much of this is required procedure and further requirements are documented in Forest Service Manuals and Handbooks. The second monitoring section describes the project specific items to be monitored. As mentioned above, the mitigation measures to be monitored are listed in Chapter 2. While most of the project is monitored through standard procedures and established practices described above, special additional monitoring items are described where appropriate.

Appendix C contains the selected Best Management Practices for this project. These describe the prescribed practice and also identify its expected effectiveness.

Implementation Monitoring Plan

Project implementation generally involves the efforts of a variety of individuals with both specialized and general skills and training. Employees are accustomed to working together to achieve the desired project objectives. For example, it is common for a contract preparation forester or contract administrator to discuss, on a regular basis, specific ground or project conditions with the wildlife biologist or hydrologist to apply the best practices on the ground. Joint field reviews are conducted as needed. These steady informal communications allow for incremental project adjustment throughout implementation to achieve the desired results. In addition to these less formal monitoring procedures, the following quality control and monitoring procedures take place.

Planning, Design, Contracts, and Project Administration

A series of quality controls are standard Forest Service or Fremont-Winema National Forests procedure and are built into the process. Initial monitoring commences during the NEPA process when the Interdisciplinary Team (ID Team) uses site-specific information, local knowledge, and resource issues in order to develop viable alternatives. Each specialist identifies specific mitigation measures for their individual resource concern and develops specific monitoring plans as needed so assure protection objectives are met. The ID Team reviews each mitigation and monitoring Plan. If Alternative C, D, E, G,

or H is selected, the Record of Decision would select and incorporate the final mitigation measures and monitoring plans into the final decision.

The Core ID Team reviews the mitigations and the monitoring plans with the Implementation team. Overall resource concerns and site-specific mitigation measures are identified and explained for each resource.

The implementation personnel initiate project layout. During the layout process, resource specialists and layout personnel continually coordinate in order to find practical solutions for implementation. For example, if layout personnel identify an area of high mortality burn within a treatment area mapped as low mortality, the resource specialists would help identify the appropriate prescription and mitigations to be applied based on the intent of the Record of Decision and the Final EIS. The adjustments would be documented and tracked.

The field data and the final mitigation measures are incorporated into a formal contract. Specialists, the appropriate Line Officer, and the Contracting Officer review the contract prior to award. Signatures are required by all.

After award, but prior to commencement of work, a pre-operations meeting is conducted between the Forest Service, the Contractor, and sub-contractors. All mitigations (now contract provisions) and their objectives are reviewed and the intent of the EIS and Record of Decision is explained.

Individuals are identified in writing and assigned a specific delegation of authority as part of the project or contract administration team. These individuals conduct the daily operations of project monitoring and administration in the field. Contract administration is done frequently and regularly to ensure that contract clauses are adhered to and effective in adequately protecting the resources.

Resource specialists are encouraged to be engaged during implementation. They are required to be involved when questions arise that are specific to their resource. Specialists coordinate with the contract inspectors and provide the Contracting Officer with practical solutions to any problems encountered. The Contracting Officer is responsible for making final determinations that comply with the Record of Decision and in the best interest of the government.

Upon completion of the project, additional monitoring trips are coordinated with the Forest Plan Monitoring Program. This program reviews and evaluates how effectively the project complies with Forest Plan direction, objectives, and standards, as well as project specific objectives.

Project Specific Implementation Monitoring

Fire and Fuels Monitoring

The fuels program does not plan any additional monitoring for this project. The current plan for monitoring would remain the same as for the Silver Lake Ranger District prescribed fire program. This consists of a planer intersect method of fuels data collection for determining fuel loading, and visual surveys using common photo series. The process involves selecting some representative areas and conducting the surveys. Depending on the size of the area, usually one planer interest plot per 20 to 30 acres is sufficient to provide the data requirements needed for smaller units. In larger units, larger representative stands are selected. Using a photo series for interpreting data is less intensive and more area can be covered in less time. Some plots may also consist of photographs for comparative purposes. Pre- and post-activity monitoring is the normal pattern of operation.

Fisheries Monitoring

Concern for the effects of the fire and the Toolbox Fire Recovery Project on aquatic habitat will focus on the risk of accelerated erosion from the burned slopes, roads, and harvest units adjacent to Silver Creek, West Fork Silver Creek, North Fork Silver Creek, and Guyer Creek, recovery of riparian vegetation, and potential increased sediment effects on aquatic macroinvertebrates. The potential for increased inputs of fine sediment could adversely affect downstream aquatic life. The specific areas of concern lie within the Silver Fire portion of the Toolbox Complex Fire. The combination of moderate to very high mortality burn in riparian areas increases the risk that heavy precipitation or spring runoff may induce stream bank sloughing, gullying or mass movement of soil into the streams.

In order to determine if potential adverse impacts to riparian and aquatic habitats on fish bearing streams resulting from the Toolbox Complex Fire, the North Zone Fisheries Program of the Fremont National Forest proposes the following monitoring program to document any potential changes in key physical and biological watershed indicators.

Aquatic Macroinvertebrates

The primary emphasis for sampling aquatic macroinvertebrates will be to monitor changes in redband trout prey abundance and composition and to use this as an indicator for changes in fine sediments. Sampling will consist of three representative riffle habitats per fish-bearing stream using a Surber sampler with a 500 micron net enclosing an area of 0.3 square meters. Within each riffle, three samples will be collected and combined for a total estimated sampling area of 0.3 square meters. Samples will be obtained from riffles adjacent to redband trout spawning habitat, preserved in 80 percent ethanol, and shipped to a contracted laboratory for analysis. Sampling will occur in 2003, 2005 and 2008.

Data analysis of samples will require use of a Rapid Bioassessment Protocol that uses a variety of metrics used to describe stream condition and the structure of the aquatic macroinvertebrate community. Calculated metrics will be those most likely to detect change in habitat quality. These metrics will include richness measures, composition measures, tolerance/intolerance measures, and feeding measures.

Riparian vegetation

The response and recovery of riparian vegetation to different levels of burn intensity will be monitored. Photo points and transects will be established on each fish bearing stream. Attempts will be made to locate at least one photo point/transect in each type of burn intensity per stream, if applicable, with two to three sites per stream. The South Central Oregon riparian field guide will be used to identify plants and ecological type. The photo monitoring will be used to determine the progression of functional interactions between riparian vegetation and stream channels.

Riparian area and stream channel interactions combine to provide habitat for a wide variety of species. Streams and the associated riparian areas interact to create complex and diverse aquatic habitats used by fish, amphibians, and aquatic macroinvertebrates. The direct functional interactions between stream channels and the riparian area include:

- Recruitment of large organic debris such as snags and fallen trees into the stream channel.
- The addition on nutrients and organic matter such as leaf litter and insect fall into the stream channel.
- Stabilization of streambanks and streambed substrates, which in turn controls bedload movement.
- Modification of microclimates such as light/shade, temperature, and humidity.
- Control of flow of water, sediments, and nutrients from upland areas into the stream channel.

The riparian area provides an important physical stability to streams. Instream large organic debris acts to reduce water velocities and increase the hydraulic complexity of streams by forming a sequence of pools and riffles. The soil binding properties of root systems also reduces bank erosion thus maintaining bank stability and preventing sedimentation in the system. Riparian areas generate a large proportion of the food and prey items, which are important for fish. Aquatic macroinvertebrates, algae, terrestrial insects, leaves, and other organic materials are important food sources for fish and provide nutrients and mineral input to the stream.

Range Compliance Checks and Monitoring

To ensure management direction as outlined in the Annual Operating Instructions (AOI) is followed, range management staff conducts use supervision throughout the grazing season. This supervision allows for verification that the instructions are being adhered to. Allotment resource condition monitoring takes place throughout the grazing season. This day-to-day monitoring allows for adjustments to the instructions, if necessary, as a response to a change in resource conditions. End of season monitoring is completed on allotments as a measure of compliance with the allowable forage use standards set and is also an indicator of successful management. Use supervision, resource condition and end of season monitoring will be conducted on the allotments/pastures included in the analysis area at the end of the 2003 grazing season.

Recreation Monitoring

Monitoring of the developed recreation sites and the portion of the Fremont National Recreation Trail within the Toolbox Fire Recovery Project Area to track the short and long-term effects of the project activities and associated mitigation measures on these recreation resources will be accomplished by the following methods:

- Periodic condition review of developed facilities and the NRT corridor by Forest Recreation/Trail Coordination Staff.

- Regular inspection and upward reporting of site/trail and surrounding area conditions by District maintenance crews.

- Forest and Ranger District follow-up of recreation visitor comments or concerns related to project-related conditions.

Sensitive Plant Monitoring

In an attempt to keep noxious weeds out of the bulldozer lines in and adjacent to *Castilleja chlorotica* habitat, the bulldozer lines will be monitored minimally once a year for three to five years.

Trained botanical personnel will monitor the unit boundaries to ensure *Castilleja chlorotica* is excluded.

Trained botanical personnel will monitor unit layout to ensure skid trails and landings avoid *Castilleja chlorotica* plants, to the extent possible.

The project area will be monitored for appearance of *Iliamna bakeri* and sites will be protected if they are discovered.

In the Winter Rim and Foster Butte Allotments, *Castilleja chlorotica* will be monitored to ensure the cattle are not overgrazing the plants.

Noxious Weed Monitoring

Noxious weed monitoring is an on-going element of the overall Noxious Weed management program on the Silver Lake Ranger District. In light of well documented potential for invasives to spread within the project area, regardless of which alternative is chosen, monitoring that will occur under that on-going program will sharply focus of the project area for the next several years. The fire created suitable habitat for weeds. Weed seeds are readily dispersed by wind, vehicles, and animals. Additionally, as described in the cumulative effects section, fire suppression activities may have introduced noxious weeds to the area, and ground-disturbing activities on adjacent land ownerships may increase weed spread in the area. Monitoring will focus not only on the areas where ground disturbing activity such as salvage harvest, fuels treatment or prescribed fire are proposed, but on timber haul routes as well. The District Botanist implements the monitoring program.

On federal lands, all noxious weed sites within and adjacent to the Toolbox project boundaries have been given top priority for treatment in 2003 and 2004. Gravel pits designated for use in road maintenance/construction for the Toolbox project have been surveyed and are currently weed free. The number of sites and locations of noxious weeds on industrial or non-industrial forestlands are unknown. The Canada thistle site in Harvest Unit #131 and any new sites discovered in or near units during monitoring and unit layout would receive priority for treatment in 2003 and 2004 in an attempt to eradicate the sites before harvest and other ground disturbing activities occur.

Soils monitoring

For prudent assessment, the area along the rocky draws in treatment units 130, 131, 134, and 138 of lodgepole pine forest in Case 7 will be visited by a soil scientist. With a slight, (14 percent) probability of treatment sediment in Case 7, the rocky draws in treatment units 130, 131, 134, and 138 will be monitored to check timely recovery.

Watershed Monitoring

Sediment sampling at existing and several new locations will be completed in the fall of each year for the next 5 years. The new locations will include the primary intermittent streams: East Duncan Creek, Duncan Creek, and Benny Creek. There will be five samples taken at each site. The sample will be dried, sieved, and weighed.

Riparian vegetation response will be monitored on perennial streams to verify where any deciduous planting will be necessary. Riparian vegetation response on intermittent streams will be monitored to ensure recovery. The monitoring will consist of walking the perennial streams and noting areas that lack riparian vegetation recovery, locate the sites with a Global Positioning System (GPS) device, and planting the site with native riparian plants.

During harvest within RHCA 1 and flowing RHCA 4 areas, the adjacent stream will be ocularly monitored for increases in turbidity.

Temperature monitoring will continue throughout the analysis area and will not be augmented as a result of the project.

Effectiveness of road closures and decommissioning will be monitored through photo point analysis. The monitoring will focus on the recovery of ground cover of the treated road, evidence of surface erosion, and effective drainage of treated roads.

Monitor Units 130, 131, 134, and 138 for sedimentation if they are treated through the activity.

Bank stability of Willow Creek (Lower Duncan Creek subwatershed) will be evaluated in 2003.

Wildlife Monitoring

Monitoring began in 2003 to monitor the effectiveness of salvage logging prescriptions designed to maintain habitat for sensitive woodpeckers including black-backed woodpeckers, Lewis' woodpeckers, and white-headed woodpeckers. Surveys will include nest searching and monitoring within some of the areas identified as suitable habitat for black-backed woodpeckers and Lewis' woodpeckers as described in the Existing Condition Section of this report, and vegetation sampling. See Appendix D for more information on this study. The objectives of the study are:

1. To determine the nest occurrences and reproductive success of black-backed, white-headed, and Lewis' woodpecker within predicted "suitable" and random sites within the Toolbox and Silver Fires.

2. To determine the effectiveness of the salvage logging prescriptions designed to provide habitat for sensitive woodpecker species in the Toolbox and Silver Fires compared to traditional methods of snag retention in post fire conditions on the Fremont National Forest.

3. To determine habitat characteristics at multiple spatial scales associated with nest sites of sensitive woodpecker species and to compare those habitat characteristics with random sites to determine habitat preferences.

4. To conduct an accuracy assessment of the vegetation mortality mapped by aerial photos with that recorded at ground locations by cover type and crown closure.

5. Determine if vegetation mortality and fire severity are important for nest site selection by woodpeckers.

Results from this study will help managers evaluate the effectiveness of varying salvage logging prescriptions for maintaining habitat for sensitive woodpecker species. Results will also help in assessing the ecological trade-offs associated with salvage logging, such as potential conflicts among sensitive species of woodpeckers and the removal of commercial material. Information from existing studies and from this proposed work will be used for evaluating salvage logging projects through National Environmental Policy Act (NEPA) analyses, appeals and litigation, sub-basin reviews, watershed analyses, forest plan revisions, long-term monitoring strategies, and consultations, including recovery plans, and biological assessments, evaluations, and opinions. Thus, by addressing the ecological consequences of various levels of salvage logging, this study will provide crucial information for planning and implementing salvage logging projects in ponderosa pine forests of the Interior West.