United States Department of Agriculture

Forest Service

Pacific Northwest Region

Monitoring and Evaluation Report

Willamette National Forest

Fiscal Years 2012 - 2013

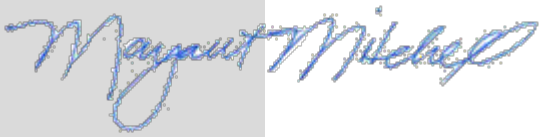
Proxy Falls,
Three Sisters Wilderness
McKenzie Ranger District

Welcome to the 2012 and 2013 Willamette National Forest annual Monitoring and Evaluation report. This is our 24th year implementing the 1990 Willamette National Forest Plan, and this report is intended to give you an update on the services and products we provide. Our professionals monitor a wide variety of forest resources and have summarized their findings for your review.

The climate, in which we began implementing the Forest Land and Resource Management Plan (LRMP) in 1991, has changed considerably. The extensive method we go through to answer Monitoring Question 1 has stayed constant throughout these years. It is a detailed 2-day monitoring process done on the ground by several land managers and decision makers to assure we are doing what we said we would do. This effort is accomplished every year at each district and has proven to be invaluable to all who participate. Results begin on page 75.

I invite you to read this year's report and contact myself or my staff with any questions, ideas, or concerns you may have. I appreciate your continued interest in the Willamette National Forest.

Sincerely,



MEG MITCHELL

Forest Supervisor

Willamette National Forest

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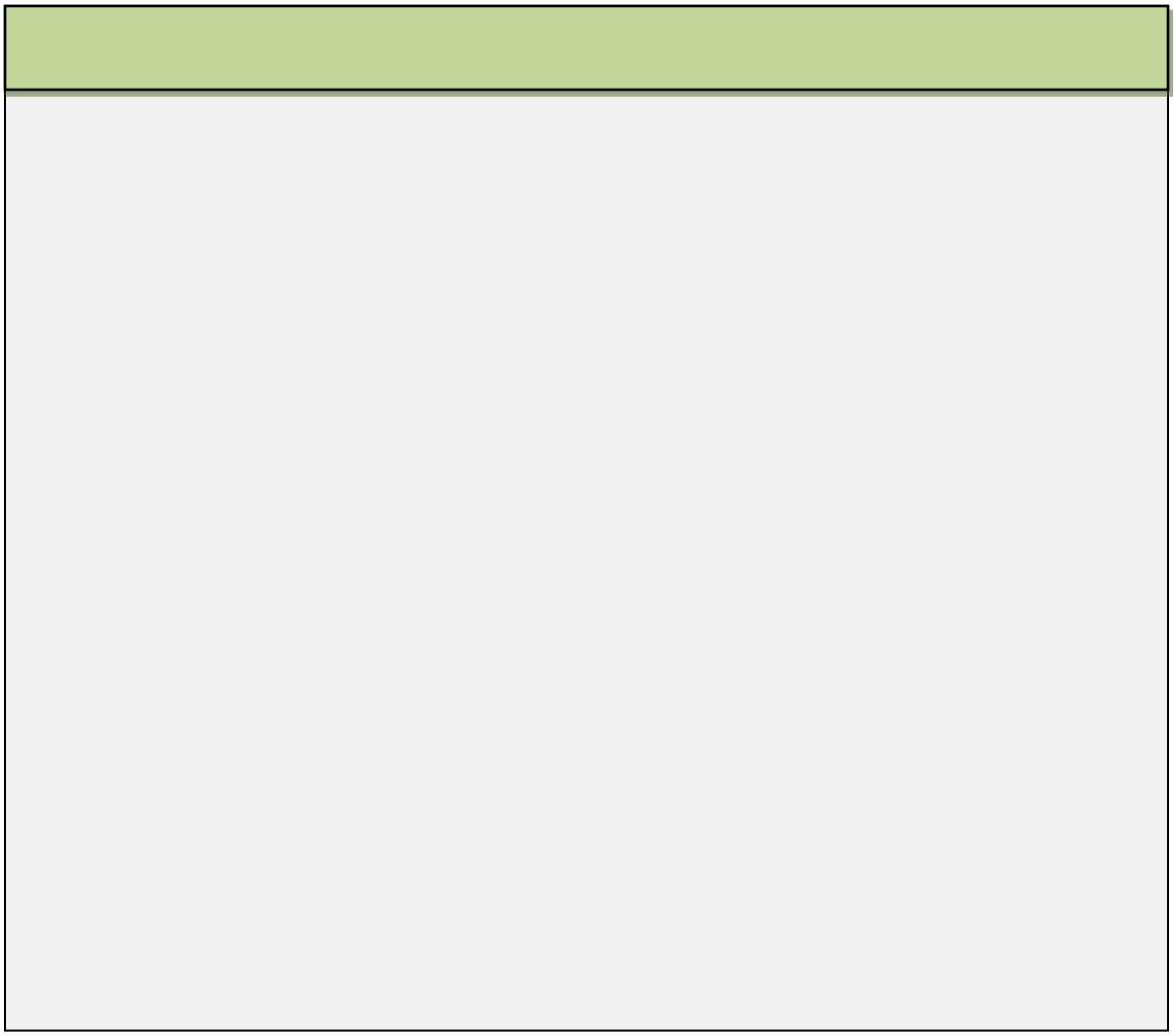
MONITORING AND EVALUATION REPORT

This report focuses on the monitoring and evaluation process described in Chapter V of the Forest Plan. The document provides an overview on how the Plan's management direction is being implemented and an evaluation of the current conditions. The questions and the answers have changed as conditions have changed and new information has become available.

If you would like an additional copy of this report contact Judy McHugh (541 225-6305) or write to: Willamette National Forest; 3106 Pierce Parkway Suite D; Springfield, OR 97477.



Introduction and Background

The Land and Resource Management Plan (Forest Plan) for the Willamette National Forest was approved by the Regional Forester on July 31, 1990. We began implementing the Forest Plan on September 10, 1990.

The Forest Plan is the basis for integrated management of all the Forest's resources. It designates areas of resource management emphasis based on the capabilities of these areas and the differing levels of goods and services that are projected to come from them. The Forest Plan also specifies monitoring and evaluation requirements to provide information necessary to determine whether promises are being kept, and to assure assumptions made during analysis are valid.

On April 13, 1994, the Secretaries of the Departments of Agriculture and Interior signed a Record of Decision for the Management of Habitat for Late-Successional and Old-Growth Forest Related Species, referred to as the Northwest Forest Plan or NWFP, which amended the Forest Plan by establishing new land allocations (management areas) and standards and guidelines (S&Gs). The implementation of these new management areas and S&Gs began May 20, 1994.

On April 9, 2012 the Forest Service released its 2012 Planning Rule and would begin to implement the rule the 30 days following. A part of this rule is the Monitoring Report would be published every two years. To prepare for this new rule the Forest did not published a Monitoring Report in 2012. The first time since the plan was published in 1990. This publication covers FY 2012 and 2013 and will be our first Forest Monitoring Biennial Report .

Monitoring Strategy

To meet the challenge of monitoring, the Willamette National Forest developed a strategy designed to address questions asked in the monitoring section of the Forest Plan (Chapter V) and to assure compliance with the Standards and Guidelines established in the Northwest Forest Plan. The basic elements of that strategy were:

1. *Identify the monitoring that is currently being done on the Willamette National Forest.*
2. *Supervisor's Office Staff develop plans and programs to address the questions asked in the monitoring section of the Forest Plan (Chapter V).*
3. *Forest Supervisor and Staff review at least one project on each District. The focus of that review being to determine, "Did we do what we said we would do?"*
4. *Publish a report displaying the results of monitoring and an evaluation reviews.*

The measure used in the Forest Plan monitoring questions is the "Threshold of Variability" or TOV. The TOV is a threshold that when exceeded triggers further investigation to determine a proper course of action. For many questions the TOV has been exceeded due to the subsequent Northwest Forest Plan that materially altered many outputs predicted in the Forest Plan. A Forest Plan revision has been delayed and does not have a schedule to begin. The revision once complete will alter predicted outputs to a level probable under the Northwest Forest Plan. Where the TOV no longer provides useful information, a narrative and data will still be provided.

Monitor and Evaluation

Monitoring and evaluation provide the control system over management activities on the Willamette National Forest. Monitoring and evaluation each have distinctly different purposes.

Monitoring is gathering information and observing management activities. Forest Plan monitoring is organized into three levels:

Implementation Monitoring is used to determine if the objectives, standards, guidelines, and management practices specified in the Forest Plan are being implemented. "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. "Are the management practices producing the desired results?"

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. "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 amendments or revisions.

This report emphasizes the question, "Did we do what we said we were going to do?" as well as reporting the progress that is being made on questions of effectiveness and validation. This approach is consistent both with the first assumption behind our Forest Plan monitoring strategy and the last guarantee in the Forest Plan Guarantee that promises we will show you how we are implementing the Plan. Typically, several years of effectiveness and validation monitoring results are needed to permit meaningful evaluation of trends against baseline data. These trends are revealed and discussed throughout the report when they become evident.

Summary of Monitoring Findings

A review of the monitoring activities, findings and results for the fiscal years 2012 and 2013 are presented in the following section. This section is organized in five major headings covering the range of resources monitored on the forest.

Physical Resources

The Forest Standards and Guidelines provide direction to enable the Forest to meet the goals of maintaining and improving water quality, soil productivity, and air quality. These Standards and Guidelines also provide direction to prevent, detect, and, with few exceptions, suppress fires. Below is a summary of FY12 and FY13 monitoring questions designed to assist the Forest Supervisor in determining the effectiveness of the Forest Plan Standards and Guidelines to meet the goals of protecting, maintaining, and improving the physical environment of the Forest.

CONTENTS

If the reader is interested in more information than what is provided in the following summary they may request the documents listed under "Supplemental Information".

PHYSICAL RESOURCES SUMMARY FINDINGS

Physical Resource	Monitoring Question	Monitoring Activities	Monitoring Results	Supplemental Information
Water Quality	25 - Water temperature	Water sampling	Results OK	Water quality FY12 & FY13 monitoring report
	26 - Water turbidity	Field evaluations	Results OK	
	27 - Peak flows	No formal monitoring	No new results	
	30 - Lake quality	Field monitoring	Results OK	
Soil Productivity	32 - Soils, mass movement	On-site visits	Results OK	Soil FY12 & FY13 monitoring report
	33 - Soil productivity, mass movement	Routine monitoring	Results OK	Water quality FY12 & FY13 monitoring report
	34 - Soil productivity	Site visits and implementation monitoring	Results OK	
Air Quality	35 - Air quality	Reported smoke intrusions, lichen surveys	Results OK	Fire Management and Lichen FY12 & FY13 monitoring reports
Fire	36 - Fire protection	District reports	Results OK	Fire Management FY12 & FY13 monitoring report
	37 - Fuels treatment	Forest report	Results OK	

Water Quality

Monitoring Questions 25 & 26: Water Quality: Temperature and Turbidity

Are Standard and Guidelines effective in meeting State Water Quality Standards for turbidity and temperature?

In October 2006, Oregon Department of Environmental Quality issued the Willamette Total Maximum Daily Load (TMDL) for point and non-point sources of pollutants in the Willamette Basin. This TMDL was completed by the State as a requirement under the Clean Water Act and focused primarily on water temperature, analyzing shade as a surrogate for water temperature. As Designated Management Agencies required by law to meet requirements of the Willamette TMDL, the Willamette and Umpqua National Forests jointly submitted a Water Quality Restoration Plan (WQRP) in April 2008, serving as an implementation plan for the TMDL for the North Santiam, South Santiam, McKenzie River, Middle Fork Willamette, and Coast Fork Willamette Sub-basins (USDA Forest Service, 2008). This WQRP outlines how ongoing active and passive restoration will address critical riparian shading needed to protect and enhance surface water temperatures on the Forest. Given the completion of both the Willamette TMDL and the corresponding WQRP, all streams listed on the 303d list on Willamette National Forest were moved to category 4A, TMDL approved for the updated list in 2010. Through implementation of Forest Plan Standards and Guidelines and adherence to the Northwest Forest Plan, management of stream-side areas is contributing to a trend of improved riparian conditions that will lead to maintained or enhanced water quality over the long term

Maximum water temperatures occur primarily in July and August in the wider stem channels with less riparian shade.

Each year the Forest measures summer water temperature at several sites to establish reference conditions and answer specific questions about forest management or watershed restoration projects associated with species listed under the Endangered Species Act. In 2012, 80 sites were successfully monitored during summer, and of these 80 sites, 25 showed a 7-day average maximum temperature exceeding salmon and trout rearing and migration standards (16-18o C), the core cold water habitat standard (16oC) or the bull trout spawning and rearing standard (12oC) established by Oregon Department of Environmental Quality (ODEQ). In 2013, 68 sites were monitored and 28 showed standard exceedances. These maximum water temperature conditions occurred primarily in July and August, which is typical of past summer water temperature monitoring on the Willamette National Forest. Generally, those sites that exceeded standards occurred in wider main stem channels with less riparian shade, while the cooler water sites tended to be associated with headwater streams and small tributaries with better vegetative cover and contribution from cold water springs at the base of High Cascades geology.

Western basins represented in the NorWeST Stream Temperature Database, Model and Climate Scenarios interactive website.

Since 2011, the Willamette National Forest and several other western U.S. Forests have been migrating legacy high quality water temperature data into a national database. The Rocky Mountain Research Station has been taking this data, along with datasets from several organizations and agencies in the west and has composed the NorWeST Stream Temperature Database, Model and Climate Scenarios on an interactive website http://www.fs.fed.us/rm/boise/AWAE/projects/NorWeST.html.

Riparian Effectiveness Monitoring Program, set up in 1995 to monitor the effectiveness of the Northwest Forest Plan in Region 6, has begun to put out year-round temperature monitoring devices throughout Oregon and Washington, including 16 sites on the Willamette National Forest. This data will also greatly contribute to future modelling efforts like the NorWeST project.

Monitoring Question 26 is also concerned with water quality as measured by turbidity levels. While Forest personnel rely on some real-time data provided by USGS gauging stations across the Forest, most efforts revolve around the implementation and monitoring of Best Management Practices (BMPs) for projects that involve ground-disturbing activities. Environmental Assessments completed for these projects include design criteria that designate the BMPs necessary to prevent sediment from entering streams in quantities greater than background levels of variability.

In 2012, a new set of national protocols was released to provide a consistent set of BMPs to be used, monitored and documented in a national database (USDA 2012), and that same year, the Forest began testing these new protocols. 2012 testing included BMP monitoring at seven sites related to in-stream restoration, recreation, road work and timber harvest. In 2013, BMP monitoring occurred at 12 sites related to in-stream restoration, recreation, road work, timber harvest and water uses on the Forest. These efforts have been interdisciplinary and have monitored both implementation and effectiveness of BMPs at these locations. The national protocols also require documentation of corrective actions as well as adaptive management suggestions to protect water quality to the greatest degree for all activities. Results from both years indicated both fully successful implementation and effectiveness of BMPs on the Forest as well as areas where the Forest needs to improve the use of BMPs to maximize water quality protection. Improvements needed were primarily in the management of highly used dispersed camping sites in riparian areas, an ongoing challenge for resource managers on the Forest.

Also pertinent to the topic of sediment is the Willamette National Forest's Travel Analysis Process (TAP) being conducted in accordance with the Forest Service Travel Management Rule (2005). Sub-part A of this rule requires that each national forest designate a minimum (sustainable) and affordable road system that will meet administrative and public needs while

protecting aquatic resources. Preparations for this analysis began in 2011 and a full report is due at the end of 2015 as required by the rule. As part of this analysis, risk for both acute and chronic sources of sediment from roads into streams has been analyzed, taking into account soil stability, road position on the landscape, density of road/stream crossings and type of road surfacing. Along with risks to other resources and need for administrative and public access, management of the Forest's road network will continue to balance resource risk and long-term need, and BMPs will continue to be applied to reduce the risk of sedimentation in all watersheds of the Forest.

Monitoring Questions 27: Water Quality: Peak Flows

Are management practices causing changes in stream flows?

No new monitoring was conducted in 2012 and 2013 for stream flow by the Willamette National Forest. As mentioned above, historic and real-time data from USGS gauging stations are used for flow data across the Forest. Modeling of the potential changes to peak flows as part of timber harvest on Forest was done for four landscape level vegetation treatment environmental assessments using the Aggregate Recovery Percent methodology prescribed in the Willamette National Forest Land and Resource Management Plan (1990). In each case, this modeling showed that peak flows would not be deleteriously affected by vegetation thinning in each respective watershed.

Monitoring Questions 30: Water Quality: Lakes

Are Standards and Guidelines for Water Quality and Riparian Areas effective in maintaining or enhancing water quality and riparian conditions of lakes?

Lake monitoring on the Forest in 2012 and 2013 included monitoring of key chemical and biological properties of Waldo Lake. In addition, high use recreation areas on several reservoirs on the Forest were monitored to determine if high concentrations of potentially toxic blue-green algae were present and a potential public health risk.

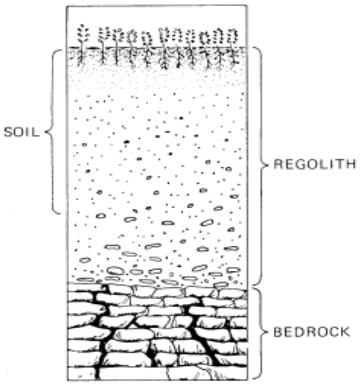
The Willamette National Forest contracted with Cascade Research Group to perform three monitoring trips to Waldo Lake in 2012 as part of the long-term monitoring program for the lake. Chemical and biological samples and field data were collected on July 23, September 22 and November 2, 2012. The highest Secchi disk reading (a measure of water clarity) was reported to be 48.9 meters on July 23, 2012 indicating extremely high water clarity. Results of the biological monitoring of Waldo Lake in 2012 indicate that *Daphnia* (a genus of small, planktonic crustaceans commonly called water fleas) were found in the lake for the first time in 43 years. Monitoring results in 2013 confirmed the re-establishment of *Daphnia* in the lake.

In 2012 and in 2013 under an agreement between the Willamette National Forest and Portland State University (PSU), water temperature data was collected in Waldo Lake from stationary instruments that recorded temperatures at various depths at one location on Waldo Lake. In addition instruments deployed by Forest Service personnel and PSU continued to monitor changes in lake level throughout the year. This information will be used by PSU to develop and calibrate a water quality and hydrodynamic model for the lake. In 2012 PSU also began field and laboratory studies to determine the rate of primary production found in the benthic zone of the lake. Results of this study are expected to be available in 2014.

In 2013 the Forest Service and PSU entered into a new agreement to implement the long-term monitoring protocol for Waldo Lake. In 2013 PSU performed two sampling and data collection trips to Waldo Lake, the first on July 10th and 11th and the second on September 12th and 13th. Secchi depth readings indicated continued high water clarity with a maximum Secchi depth of 38.1 meters recorded on July 11, 2013.

Weekly surveillance monitoring visits were made to developed recreation sites on water bodies that are known to have had blooms of potentially toxic blue-green algae (cyanobacteria) in the past. Public health advisories are issued by the Oregon Health Authority (OHA) when reported density of potentially toxic blue-green algae cells or the toxins they produce are above health based thresholds. Throughout the summer season visits were made to approximately 25 locations on Detroit, Cougar, Blue River, Hills Creek, and Lookout Point Reservoirs. Several trailheads, swimming areas, and boat ramps were posted with educational information about the health hazards of toxic blue-green algae and how to identify conditions that may be unhealthy for water contact recreation. In 2012 and 2013, the Forest used the Oregon Health Authority's (OHA) toxin based protocol for monitoring potentially toxic blooms. In both years all samples analyzed for blue-green algae toxins were below the OHA toxin concentration threshold for issuing a public health advisory and therefore no public advisories were issued for any water body on the Forest. Forest Service personnel will continue to work cooperatively with other agencies to protect human health with regard to toxic algal blooms occurring on National Forest lands.

Soil Productivity



Monitoring Questions 34: Soil Productivity

Are Standard and Guidelines effective in maintaining soil condition and conditions for nutrient cycling? Are the Forest Plan predictions of mass movement valid?

Forest Plan Standards and Guidelines used to protect soil productivity are focused on limiting the extent of compaction and displacement related to the use of ground-based

equipment on forest soils, and survey of soil effects from prescribed fire. Soil monitoring data summarized in this report will be from May 1, 2012 to September 30, 2013.

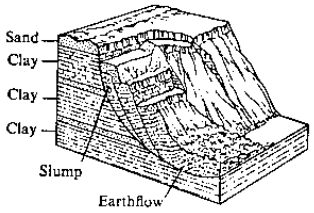
The Forest Plan requires that no more than 20% of an area harvested by ground-based machines should be impacted by roads, landings and skid trails on a given harvest unit. Post-sale reconnaissance and transect monitoring accomplished by the Forest Geologist on units of Toad Thin, Holman Thin, Old Foley Thin, Lava Thin and Pipe Thin Timber Sales revealed that Best Management Practices (BMPs) were being used properly to protect soil productivity in ground-based logging locations. BMPs included limiting ground-based machines to slopes less than 30%, using properly designated skid trails and reuse of old skid trails to minimize extent of effects, conducting ground-based operations when soils are not too wet, and placing logging slash on skid trails to minimize ground pressure. Monitoring included walking several field transects totaling an estimated 13,600 feet in 8 different treatment units to determine the extent of skid trail impact. On these transects, a shovel or probe is pushed into the soil at regular intervals to test compaction. Results ranged from 12 to 15% of surveyed ground-based logging areas having skid trails and landings, within and usually well below the Forest Plan standard of 20%.

During timber sale planning, the Forest Geologist also conducts pre-harvest transects to determine if compaction from past harvest is under or over the Forest Plan standard of 20% aerial extent. Where percent compaction approaches or exceeds the Forest Plan standard, sub-soiling of compacted areas is recommended in the Environmental Assessment. The Forest Geologist revisited the Holman Thin and Meadow Timber Sales where two units implemented mitigation sub-soiling to bring soil compaction under the Forest Plan standard. After walking 7,100 feet of transects in these two units, the Forest Geologist found that compaction was reduced by 7 and 4%, respectively, as compared to pre-harvest levels to bring soil back within Forest Plan standards.

Prescribed burning is completed under cool temperatures so fuels are reduced while still protecting soil.

The Forest Geologist also conducted post-prescribed fire monitoring of soils after under burns in the Downing and Birdie Timber Sales to treat fuels build up after logging. Forest Plan Standards and Guidelines state that severely burned areas, evidenced by duff removal and soil discoloration, should not exceed 10% of an activity area and the Forest Plan sets out standards for duff retention based on vegetation and soil types. On Downing Timber Sale unit 41, duff retention standards were 20-40% and prescribed burning left well over 90% duff retention with no signs of detrimental burning observed. Additionally, six units were monitored after prescribed under burning in the Birdie Timber Sale with positive results – 20-45% duff retention and less than 2% of units detrimentally burned. These results indicate that Fire and Fuels personnel are successfully carrying out under burning at times of year when fuel moistures are conducive to "cool" mosaic burns that protect soils and achieve fuels treatment objectives prescribed by the Forest Plan.

In 2011, the Forest Geologist also documented visits to Smith Thin, Tommy Thin, Girl Thin and Cub Thin timber sales to consult on harvest operation effects to soil and proper unit layout. Consultation at these sites included whether designated logging systems were appropriately protecting soils, discussion of proper road drainage as part of a haul route, and where fill material could safely be placed so that aquatic resources would not be affected. In each case, Timber Sale administrators asked specialists to come in and evaluate operations to make sure that Forest Plan Standards and Guidelines were being met and in each case, the Forest Geologist approved or adjusted operations or prescribed BMPs to assure standards would be met.



Monitoring Questions 32: Water Mass Movement

Are Standard and Guidelines effective in managing mass movements to meet Forest goals?

The monitoring of mass movements involved the evaluation of typical sites of existing and previously unstable failures where road construction or other activities occurred. Site work can be divided into five categories: MQ 32.1- Construction / Reconstruction, MQ 32.2- Stabilization / Mitigation, MQ 32.3- Maintenance Practices, MQ 32.4- Decommissioning, and MQ 32.5- Large Earthflow / Historical Baseline. The content of this year's report will be directed at both A) larger, active, naturally occurring slumps or slump / earthflow complexes and their effects on the various transportation systems on the Willamette National Forest, and B) smaller site specific failures that directly impact a roadway. The work on various slides will include all the elements mentioned above, except MQ 32.4. This report discusses work that has been monitored from latter part of 2010 through the spring of 2014. Section Item II reviews the various unstable areas that were highlighted in last year's report. Section III will look at each of the slides listed, discuss tasks that were completed, highlight the monitoring results and current status.

Proposed Slide Areas Under Investigation

Boone Cr. Slide on McKenzie River Ranger District.

The Boone Creek Slide is located on Road 19 at Boone Creek, approximately 0.5 mile north of the Terwilliger Day Use Area at Terwilliger Hot Springs. Road 19, also known as the Aufderheide Memorial Drive, is a double lane paved road that extends through the Willamette National Forest from Hwy. 126 on the north to Hwy. 58 near West Fir on the south. At the Boone Creek Slide, the road crosses near the bottom of an approximately 45 acre semi-active to active slump / earthflow complex. The toe of the slide is just at or below the high pool elevation of Cougar Reservoir. Approximately 370 to 400 feet of road is affected. Currently, this section of road is graveled instead of paved to facilitate regular road maintenance.

Geotechnical work was conducted at the site, and several drainage improvements were implemented. Throughout the 1980s, this road segment had to be reconstructed every few years because of soil settlement and asphalt cracking and deterioration. In response, a drainage culvert was relocated from the center of the slide to the original channel on the south side of the slide and drainage improvements were constructed above the road. This appeared to slow slide movements, and noticeable improvements to the road surface were evident in the early 1990s. However, the intense rain storms and rain-on-snow events of 1996/1997 caused renewed failure of the asphalt. Geotechnical work was again conducted at the site. The principal work involved more drainage improvements above the road, primarily in terms of surface ditching. Slope indicators were also installed and monitored as part of a slope stability study in the 2000s. The slide is still moving, but the rate of movement has apparently been reduced to the acceptable level noted after the improvement constructed in the 1980s.

Poly Retaining Wall on Middle Fork Ranger District.

This slide is located at milepost 1.65 on Rd 1926. The road was built over a localized unstable area that is part of a large earth movement that extends uphill. In the 1970s, the road segment had dropped and formed an approximate 10 foot dip across the failure. In 1981, a wood chip/geotextile wall was constructed across the site. The slide still showed movement, but at a much reduced rate. The wood chip wall was replaced in early 2000s with a light weight Poly/block wall.

Highway 20 on Sweet Home Ranger District

The FY 2005 Transportation Legislation contained a provision for the study of unstable areas along a critical section of Hwy. 20. The project is included in Western Federal Lands Highway Funds and will be administered by Federal Highway Administration (FHWA). The project is a coordinated effort between FHWA, the Oregon Department of Transportation (ODOT), the U. S. Forest Service (USFS) and Linn County. The proposal is to investigate active landslides on U. S. Highway 20 between Cascadia and Santiam Pass to develop a long-term repair strategy. Specific projects are located between milepost 53 and milepost 61. The slides are as follows:

1) Milepost 53.7/53.8 – **Double Gate**: This is a large, actively unstable, slump / earthflow complex of approximately 20 acres, with the toe in the South Santiam River. The head of the slide is about 1500 feet above the road. Relief from the toe of the slide in the River to the top of the unstable area is about 800 feet. During the 1996 storm, a section of toe approximately 60 yards long, 30 yards wide, and 10 yards deep failed and was washed away by the River in a few hours. Subsidence at the roadway is usually a few inches each year. Little seepage or surface water is present anywhere on the slide mass above the road. Standing water is evident just below the road on the east side of the failure.

2) Milepost 54.2 – **House Rock Slide**: This is a large slump / earthflow complex of approximately 21 acres with the toe at Hwy. 20. This slide is most interesting in that it is a new failure in terms of its effect on the Highway. It began to deform the pavement only in the last fifteen years or so. This section of highway was stable from at least the late 1970s to the mid 1990s. The toe is on the Highway or just below it, and it has been drilled by Federal Highways (Report dated May 20, 1998). The head of the slide is almost one half mile upslope of the road. Relief from the toe of the slide to the head is about 800 feet. A perennial stream runs down through the slide for almost its entire length.

3) Milepost 55.4 / 55.5 – **Lower Sunken Grade**: This is a large slump / earthflow complex of approximately 64 acres with about half of that, 33 acres, being very actively unstable. The top of the slide is about 1700 feet above the roadway and the toe is located in Sheep Creek. As with other major failures, relief from the toe to the head is about 800 feet of elevation. The Lower Sunken Grade has shown movement rates of an inch a day during some periods. In the last decade or so, movement rates show a drop on the road grade of around 2 to 5 feet per year. Changes in alignment can be more substantial. The slide is expanding both above and below the road way.

4) Milepost 56.1 - **Upper Sunken Grade**: This is a large, actively unstable, slump / earthflow complex of approximately 18 acres with the top of the slide just above the ditch line of the road and the toe in Sheep Creek. The instability affecting the highway corridor is the western arm of this unstable area. The retaining wall just to the east of this slide was constructed about a decade ago to stabilize the eastern arm of the Upper Sunken Grade. At the roadway, the eastern arm of this unstable area and the western arm are separated by a small area, about one acre in size, of stable ground. A perennial stream crosses Hwy 20 at this small stable area, drops down along the eastern side of the western arm, and then empties onto the main slide mass a few hundred feet below the road way. In the early 1980s the eastern arm and the western arm were actually two separate slides that extended to the Santiam River. However, in the last several years, the toe areas of both have grown together. This slide drops from a few inches to about one foot per year.

5) Milepost 56.7 to 56.8 – **Sheep Creek Complex**: This slide area is a very large slump / earthflow complex of about 100 acres. It includes areas of active slumps, debris chutes, and more stable areas. The most actively unstable area occupies about 30 acres. It begins at the east abutment of the Sheep Creek Bridge and extends east for about 500 feet along the road way. The top of this actively unstable portion is about 500 to 600 feet above the roadway and the toe is located in Sheep Creek. This slide is very complex with both sinking and rising road grades and the moving bridge abutment on the east end of the Sheep Creek Bridge. The highway at this site was reconstructed over 10 years ago to improve driver safety.

6) Milepost 60.1 – **Tunnel**: The overall site is characterized by a, semi-stabilized, slump / earthflow complex that covers about 26 acres, both above and below the road. Anecdotal evidence indicates that this area (or parts of it) may have been moving in the 1940s, during or soon after the highway was constructed. The site received it name from an actual tunnel dug

into the slope above the highway about 300 feet west of this slide. The "tunnel" was used to drain the slide mass. Field evidence indicates that the area immediately above the highway may also have been used as a rock source for highway construction. At this point, the actual slope instability affecting the highway corridor is a small, slump-type failure about 4 acres in size with about a 100-foot-long, settlement crack in the pavement. The active failure extends into the west bound lane, but does not extend uphill of the roadway. Settlement rates are approximately six inches per year. Springs and standing water are present above the road and in the ditch line. The toe is several hundred feet below the road.

Frazier Slide on the Middle Fork Ranger District

The Frazier Slide, located on the northeast slopes of Coyote Mountain, occurred January 19, 2008. The upper portion of the slope failure covered or obliterated the Union Pacific Railroad line for about 900 to 1000 feet. The total slide covers about 60 acres, and the failure area above the railroad grade extends over about 20 acres. This slope failure has elements of both an upper rotational and a lower translational failure mechanism, with the dividing line around the elevation of the railroad grade. The larger portion of the slope failure below the railroad grade is translational in nature and is run out of saturated or liquefied soil from the primary rotational failure above. The final slope stabilization work on the Frazier Slide was completed in the late fall of 2008. Essentially, a large rock buttress was constructed at the toe of the slide. A considerable mass of failed material, several hundred thousand yards, was hauled away to stable waste areas, and a drainage control system was constructed near the toe of the slide area.

Other Sweet Home Ranger District Road Failures

1) FS Rd. 2044000, Latiwi Road, Mile Post 3.3

A sunken grade exists at mile post 3.3 on Rd. 2044000. The road has dropped approximately 2 to 3 feet for a distance of about 200 feet. The road settlement is part of a large (3 to 4 acre), deep seated earthflow, that has been moving for decades. The road is located approximately in the middle of the slide mass with about 200 to 300 feet of distance to the toe at the creek and roughly the same distance to the rock scarp at the back. Failure depths are estimated at 50 to150 feet, with the toe at a major tributary of Three Creeks. Rd. 2044 will be needed for timber haul, and the desire was to have Rd. 2044 accessible with low-boy hauling equipment. The route with the ramps into and out of the slide did not meet that standard.

2) FS. Rd. 2045000, Holman Creek Road, milepost 6.5

The Holman Slide is an actively unstable slump / earthflow complex of approximately 7 acres that resides within a much larger area (several dozen acres) of a potentially highly unstable slump / earthflow terrain. In turn, this potentially unstable upland area is the head wall complex for several hundred acres of stabilized slump / earthflow topography. About 6 or 7

acres begin actively moving perhaps after the 1964 storm event. After the 1996 storm event, parts of the slide finally had reached Rd. 2045. Minor maintenance and repair work has been conducted almost annually since then to keep the road way open.

3) FS. Rd. 2027000, Moose Mountain Road, milepost 6.5

A sunken grade exists at approximate mile post 2.75 on Rd. 2027000. The road has dropped approximately 2 to 4 feet for a distance of about 200 feet. Rd. 2027 is needed for timber haul. The desire was to have Rd. 2027 accessible with low-boy hauling equipment. Prior to any repairs, it is doubtful if this route would pass loaded log trucks, yet alone a low boy. The failure extends down the hill for 250 to over 300 hundred feet. Failure depths are below rooting depth, but not a great deal. Portions of this unstable area may have been moving for perhaps 40 or 50 years.

4) Road 2047000, Milepost 0.7

This slide failed in the winter of 2009. The slump-type failure, at the road shoulder, extended along the road way for about 70 feet. Over all, the slide was about 110 feet across and dropped down the hill about 100 feet to end on or near a large, stabilized slump bench. When it failed, approximately 6 feet of road width dropped about 1 to 2 feet; about 8 to 10 feet of road width remained. The road was nearly impassable. The repair involved removing the failed soil and rebuilding the road way with an open graded rock fill. The work was completed in the summer of 2009.

5) Road 2047000, Milepost 1.05

This large slump / earthflow failure extends along the road way for about 100 feet at the road shoulder. Over all, the slide is about 200 to 300 feet across and extends intermittently down the hill about 700 to 800 feet to end near the shores of Johnny Lake, a large sag pond. The failure at this site has been moving for many years (decades) and appears to be getting progressively worse. During the winter of 2009, approximately 10 feet of road width had dropped about 1 to 2 feet. Only about 2 to 3 feet of road width remained unaffected. Again, the roadway was nearly impassable. The repair consisted of shifting the alignment into the hill side about 9 to 12 feet for a distance of 20 to 25 yards. This work was completed in the summer of 2009.

II. MONITORING WORK COMPLETED

A. Boone Cr. Slide on McKenzie River Ranger District.

A reconnaissance investigation of the entire unstable area was first conducted by me in the spring of 1994 as part of the Willamette National Forest South Fork Pilot Watershed Analysis. On November 29, 2010, I conducted another intensive field review of the entire slide mass as part of the ongoing environmental analysis for the Green Mountain project planning area. The

Green Mountain project intends to look at thinning of older managed stands and naturally fire – regenerated older stands. At this point, no potential Green Mountain stand would affect the Boone Creek Slide.

Some observations and conclusions:

1) The drainage improvements implemented about 10 years ago seem to be stabilizing (or reducing the rate of movement within) the toe area of the slide between the road and the reservoir. The soils in this toe area appear to have dried out with the containment of the stream flow on the north side of slide area. Road settlement seems to have stabilized, and more recently leaning trees and tension cracks are not evident below the road way and extending to the lake shore.

2) The storm events of 1996/1997 and subsequent events through about 2000 or so caused additional small debris chute type soil failures on the slide scarp on the northeast corner of the slide near its highest point. The debris chute scar evident on the 1990 photo (8-1-90, 1190-28) has partially vegetated with brush and conifer. Newer bare soil scarps are now evident to the east of this failure. These slides form short debris chutes that piled up on the slump benches beneath.

3) The slide mass is generally saturated throughout. Small areas of ponded water are evident at the ground surface in numerous low spots, in root wad depressions from over turned trees, and in the numerous small springs that pop out in various locations.

4) Although this is a most subjective observation, it appears that the slide mass above the road has not slowed to any degree, but it some ways appears to be moving at rates that equal or exceed those apparent in 1994. More leaning and swayed trees seem evident, as well as a few more tension cracks.

More recently, I stopped and looked at the lower end of this slide area along Rd 19 on June 12, 2014 (as well as several times earlier in the spring). The slide came through the winter without much settlement. The gravel section is rough, mostly from pot holes. No obvious tension cracks are apparent.

In summary, the Boone Creek Slide is a semi-active to active earthflow that is crossed near its toe by Road 19. Movement rates are such that a paved road surface is broken relatively quickly. Consequently, the surfacing on the road through this section is and has been gravel for many years. Geotechnical work at the slide in the last twenty years or so has slowed movement at the road and begun to stabilize the toe area of the slide below the road. The stabilization work, primarily in the form of drainage control, has helped to better protect the road bed and drainage crossings. There is no indication that the larger part of the slide, uphill of the road, is beginning to stabilize. Hopefully, the current status quo will exist for some time to come.

B. Poly Retaining Wall on Middle Fork Ranger District.

Mark Leverton indicated to me (in an email, dated 1/27/2011) that visual monitoring in 2010 indicated no change in the status. The improvements appear to be functioning properly.

I stopped and looked at this site on April 15, 2014. The exit end of the wall (the side farthest uphill or away from the Rd 19 junction) has dropped about 2 to 4 inches as show by a new tension crack in the pavement. The entrance side has not shown any corresponding movement. However, the pavement about 200 feet distance before the wall (towards the Rd 19 junction) has new cracks and settlement of about 0 to 2 inches for about another 100 feet or so along the road shoulder towards the junction with Rd 19. What this likely all means is that the entire hill side for dozens of acres above the poly wall is beginning to settle more. Extensive reconnaissance by Mr. Leverton and I in past years indicates that much of the area well upslope of the road way is actively unstable. This active movement may finally have begun to affect the area immediately above the road. The poly wall is still functioning as it was designed. Whether Rd 1926 will be here in future decades will be interesting to watch.

C. Highway 20 on Sweet Home Ranger District

The Final Report (January 26, 2011) for the Landslide Investigation and Analysis, South Santiam Highway, US Route 20, Slope Stabilization was presented by Cornforth Consultants, Inc. (10250 SW Greenburg Rd. Suite 111 Portland, OR 97223ph. 503-452-1100 fax. 503-452-1528) and accepted. Based on those findings, the US Forest Service, Oregon Department of Transportation, Linn County, and the City of Sweet Home began the process of submitting for funds from the Western Federal Lands Highway Fund to start stabilization work on the six active landslides. It was initially hoped that funds to begin work would become available in 2015 or 2016. Unfortunately midway through the effort, the application process changed and grant submission had to be restarted in the spring of 2014. Work is currently underway to again seek funds with the intent of work beginning in about 2018 or so.

I investigated all the Highway 20 slide areas several times during the spring of 2014, and generally things are not looking too well.

a.) Double Gate: This slide has moved the least of the group, and the active face just above the South Santiam River is beginning to green up (show vegetative growth). However, fresh tension cracks still appear at the margins on the highway pavement. If this continues, this slide may be moving towards a major failure in the coming years as mass begins to accumulate and the face starts to over steepen. Slope failure is usually initiated during flood events when high water erodes the toe of the over steepened slope.

b.) House Rock: Two years ago ODOT made some drainage improvements at this slide and settlement stopped. It was hoped that some small success was finally achieved along the Highway 20 corridor. However, earlier this spring, the toe of the slide dropped about two to four inches in the pavement. Small tension cracks now evident in the asphalt repair work would indicate that this slide area is still moving.

c.) Lower Sunken Grade: Two years ago, ODOT shifted the alignment up the hill one lane width and regraded the roadway to nearly level. Unfortunately, in the last two years the slide has dropped more than four feet. The roadway again has substantive sag, and the alignment is being shifted down the hill. It is likely ODOT will soon again have to complete major repair efforts to maintain a viable road.

d.) Upper Sunken Grade: This area continues to move. It appears settlement this spring may be slightly greater than in past years.

e.) Sheep Creek: This slide area is having its difficulties also. The major grade improvements that were completed in 2000 / 2001 have all but disappeared. Total settlement is near where it was prior to that work (around five to six feet or so). ODOT has had to do considerable reconstruction on the west end of the slide to lower grade in an area that continues to rise and create an unacceptable vertical curve. Finally, ODOT also plans new bridge abutment work on the east side of the Sheep Creek Bridge as the existing abutment continues to shift downslope. The field investigation indicated that a major blow out of several hundred cubic yards occurred in the past two years at the toe area in Sheep Creek. Confounding the problems, new settlement (three to five inches) is now also evident on the highway in the area of Ram Creek on the east side of the slide area. All and all, it is difficult to say where this will end up in the coming years, other than farther down the hill.

f.) Tunnel: ODOT completed some drainage improvements in the ditch line last year. So far at least, movement has not gotten any worse. Perhaps, this one might show improvement in the coming year.

D. Frazier Slide on the Middle Fork Ranger District

Mark Leverton indicated to me (in an email, dated 1/27/2011) that visual monitoring in 2010 indicated no change in the status. The improvements appear to be functioning properly.

The slope stabilization measures (rock buttress, horizontal drains, and under drains) were working well, and no additional slope instability had been observed.

Mr. Leverton retired from the Forest Service in January of 2014. At that time, he indicated to me that his observations in 2010 were still valid.

E. Other Sweet Home Ranger District Road Failures

1) FS Rd. 2044 000, Latiwi Road, Mile Post 3.3

Within a few weeks of the 2008 investigation, the proposed road relocation work was completed. The road was shifted into the bank by raising and then lowering grade, and the old road bed was obliterated. About 400 cubic yards of excess excavation was end hauled to the designated waste area. The sale was implemented successfully.

I visited the site in both the spring and summer of 2009. No new movement has occurred, and the newly constructed road bed is intact. I again reviewed this site again in June, 2010. As before, no new settlement is evident, and the road bed is functioning well and in good condition. The review of the site in May of 2014 indicated that the repair is still working well.

2) FS. Rd. 2044 000, Holman Creek Road, milepost 6.5

A rock fill, approximately 8 feet wide, along the outside shoulder of the road was constructed to provide additional width for logging equipment and timber haul. In addition, sufficient rock fill was added to raise road grade through the slide area about 2 to 3 feet for a distance of around 50 feet. This fill would act as a small buttress for the toe of the slide. The work was completed in late June 2008, and the unstable back slope was not touched.

I visited the site in the spring of 2009 to determine what would be needed to open the road for timber haul. For all intents, the slide had not moved further. Only a few cubic yards of soil had fallen onto the roadway. The road tread on the far end of this critical section had one tension crack where the roadway dropped about 4 to 6 inches. A hike up the hill indicated that at least a portion of the actively unstable terrain appears to have started to stabilize (move much more slowly). For 2009, the rock buttress appears to be functioning and the road is available for use. A site visit later in the summer showed no change in conditions.

After the winter of 2010, few changes had taken place. One tension was located on the road way. The far side of the slide (away from Sheep Creek Saddle) dropped about 8 to 12 inches. The trench drain that was installed by CTC was still working well. Sufficient road width (11 feet or so) was available for truck traffic. My recommendation was again to protect the slide scarp and remove only the rocky slough on the roadway in the area of the rock fill (on the near side or Sheep Creek Saddle side). At the tension crack, the road was regraded to allow truck passage, without adding or removing much material. The road was reopened and used in 2010. The Timber Sale Officer reported that timber haul proceeded without difficulty.

I visited the site on September 14, 2013, and May 6, 2014. The slide has finally closed the road way. Extensive reconnaissance above the road indicates that the slide area is beginning to reactivate. More tension cracks are evident, and leaning trees are much more common. More importantly, the slide area also appears to be expanding across a wider front along Rd 2045. Potential repairs here would be expensive and problematic – they may not function for very long or could actually exacerbate the slope movement. Consequently, it was decided that the road should be permanently be closed at this site. Work is now in progress to look for an acceptable bypass route that would avoid the unstable area.

3) FS. Rd. 2027 000, Moose Mountain Road, milepost 2.75

The prime maintainer for this cost / share road decided that the best solution for this problem was to do very limited work that would provide suitable access for log trucks, but not necessarily a low boy. Consequently, they elected to simply lower the approaches slightly on

either side of the sag in the road. This had the effect of reducing grade into and out of the sag, thereby improving the vertical alignment sufficiently for log truck traffic. Essentially no fill was added to the actively moving portion of the road.

I visited this site several times during the spring and supper of 2009. No additional subsidence of the road way was observed. In a similar manner, site visits in 2010 did not show that any substantive subsidence had occurred.

I visited this site on March 27, 2014. The good news is that the road sag that has been discussed in this report has not shown any additional settlement. The bad news is that my field review was prompted by a major slope failure that occurred At exactly the same site above the road way. The slope failure was initiated by a rock fall from a cliff face several hundred feet about the road. Approximately 200 to 400 cubic yards of rock dropped off a near vertical rock joint and slammed into the 60 to 90% side slopes below. Numerous 1 to 5 cubic yard boulders were released. This mass tore down or uprooted numerous Douglas fir trees, generally ranging from about 18 to 30 inches dbh. The mass of boulders, loosening soil, root wads, and shattered trees piled up in part on the side slope below the cliff and in part on the road way below. If the elevation of the road way is considered zero, then the base of the rock fall was about 400 feet in elevation. The top of the failed scarp was about 490 feet, and the top of the ridge in this area is at 580 feet. An intensive search of the rock outcrop and the ridge line above the failure site did NOT reveal any tension cracks or any indication of a large, potentially unstable mass that could threaten the future use of Road 2027. Below the scarp, several boulders from 4 to about 8 feet in diameter have augured into the side slope or are wedged behind trees. They appear stable at this point. However, numerous rocks and small boulders are hung up in the limbs from the down timber. They could roll down at any time, and several came loose during the time of my reconnaissance. It is likely that the road way will be subject to rolling rocks for the next several weeks.

The road blockage from the rock fall was cleaned up in a few days. At this point, there is no evidence of any direct connection between the long existing road sag and the rock cliff failure. Given that both occurred at the same place on the landscape, there is a high likelihood of some geologic connection, such as a zone of weakness, perhaps related to the lithology of the underlying rock formation or an old shear zone.

4) Road 2047000, Milepost 0.7

The field review on June 16 and July 13, 2010, indicated that the site was stable. The open graded rock fill was draining the slide area, and no new cracks or road settlement were observed. I looked this site several times this spring (April and May of 2014), and it still functions as designed. No new road settlement has occurred.

5) Road 2047000, Milepost 1.05

The intent of the road realignment was not to stabilize the slide area, but move the road away from the top of the active failure. The field review of June 16 and July 13, 2010, showed that the new road tread does not have any tension cracks or settling. Numerous new tensions cracks are evident in the road shoulder area – that once was the old road way. Parts of this area dropped one to two feet this past winter. The cracks stop at the outside edge of the new road, as was desired.

As with the slide area at milepost 0.7, I visited this site several times this spring in 2014. The main slide mass has dropped over a dozen feet away from the road. Two years ago (spring of 2012), the new road shoulder showed a few tension cracks. Consequently, the roadway was again moved toward the bank about 4 to 6 feet move. Since that time, the roadway has been stable, and no new tension cracks have been evident, even though the main slide mass continues down the hill at apparently increased rates.

Conclusions

In summary, 15 slides have been discussed in some detail. These slope failures are large in scope (generally a few to many acres), and mostly of natural origin. They have caused substantial impacts to various Forest transportation systems built across their paths. All have existing stabilization or ongoing site investigation work. They are being monitored extensively in that existing improvements are continually evaluated for efficiency or repair. Several of the slides are being studied to determine cost effective ways to maintain transportation routes or reduce maintenance.

Air Quality

Monitoring Question 35: Air Quality

Are management activities that affect air quality in compliance with state and federal air quality regulations?

Legal Basis and Purpose of the Willamette National Forest Air Program

Under provisions of the federal Clean Air Act, the Wilderness Act, the Organic Act, and the Regional Haze Rule, the Forest Service has responsibilities and authorities to mitigate potential air quality impacts on all national forest system lands.

Forest Service policy assigns Regional Foresters the responsibility to respond to States or the Federal EPA on issues or actions involving the Clean Air Act. Forest Supervisors are delegated the responsibility to take action to identify impacts and to protect National Forest System lands from adverse impacts which may result from air pollution (including atmospheric deposition).

The region has an extensive air quality monitoring program using of which the Willamette National Forest is a key part of that program. A detailed reports are available through 2012. The Willamette as been reporting since 1979.

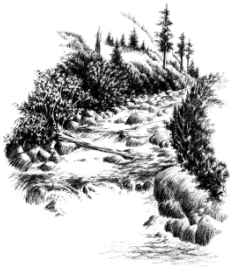
The purpose of air quality bio-monitoring in Wilderness is to assess the status and trends of air pollutants that can affect air-quality related values such as the diversity, composition, and health of flora and fauna. The target density for air quality bio-monitoring plots in Pacific Northwest Region Wilderness Areas is 1 plot per 20,000 acres. Individual plots are to be re-sampled every 10 years.

Examples of reports from 2003 through 2012

Excess nitrogen deposition can promote ecosystem eutrophication and adversely affect community composition, species diversity, and growth. Deposition of nitrogen from the atmosphere to the forest floor was calculated in kg/ha/yr from measured nitrogen concentrations in *Platismatia glauca* and *Letharia vulpina* based on a calibration of lichen N to measured ammonium and nitrates in canopy throughfall. All Wilderness located on the Willamette have no plots that exceed critical load.

Concentrations of fine particulate nitrogen are also measured. These fine particulates degrade visibility and are also strongly correlated with nutrient nitrogen deposition and shifts in lichen communities favoring eutrophs. Concentration of ammonium nitrate and ammonium sulfate particulates in the air has been decreasing at all Wilderness on the Forest. Therefore air quality and visibility, related to ammonium nitrates and sulfates, has improved.

A great deal of data has also been collected in the Wildernesses but this data still needs to be distilled but is available to view.



New Monitoring Question: Climate Change

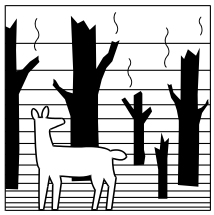
What evidence do we have of climate change and what ecological effects have been documented so far?

This new monitoring question added since the Forest Plan's publication. The information is repeated again when new information becomes available. In time, the frequency of reporting on this very important subject will begin to take form.

Climate Change Monitoring Methods on the Willamette National Forest (Temperature, Climate-Sensitive Vegetation)

Two kinds of data have been collected on the Willamette National Forest to map climate change and document the ecological effects of climate change. These are temperature and precipitation measurements and surveys of non-vascular plants (epiphytic lichens). Temperature and precipitation data are collected at weather stations throughout the region and drive a sophisticated model developed by climatologists at Oregon State University, called PRISM. The model calculates temperatures and precipitation on an 800 m scale throughout the region. Lichen community data are collected in ten year rotations by the Willamette National Forest Air Program on a 3.4 mile grid following the Forest Inventory and Analysis lichen indicator protocol. The latest report can be obtained here http://water.oregonstate.edu/sites/default/files/water_and_climate_in_the_pacific_northwest_v3.pdf

Fire



Monitoring Question 36: Fire protection

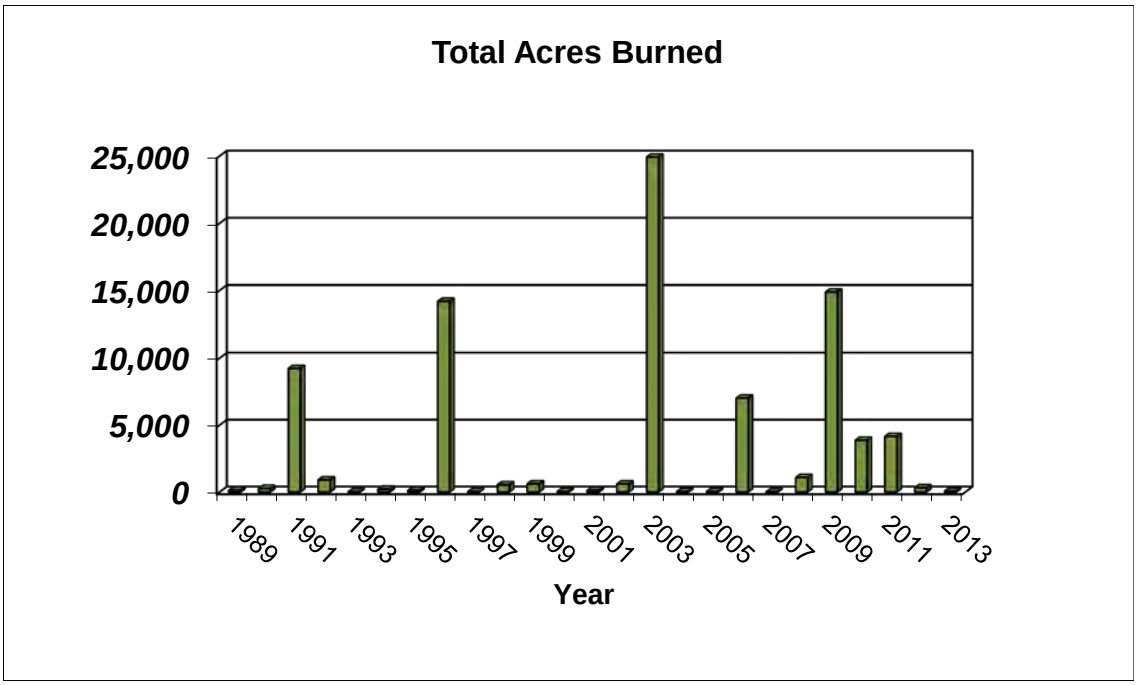
Are the acres burned by wildfire within the levels considered in the plan?

One hundred twenty fires in FY13. Sixty-four of those fires were in non-wilderness areas totally 37 acres burned. Fixty-six reported fires burned 17 acres in the wilderness in FY13. Fire occurrences in 2013 were 12% above normal, based on a 20 year average, with 120 starts.

The 2011 fire season ended in mid-September when the Willamette National Forest received significant rainfall.

As illustrated by the graph below, this fiscal year continues to depict the high degree of variability among fire patterns across the Forest.

A retrospective view of fires in the last 24 years since the Forest Plan has been implemented



reveals that over 83,160 acres have burned in both wilderness and non-wilderness. This exceeds the threshold expected by more than twice. Fires, when they do occur also exceed in size considerably.

Monitoring Question 37: Fuels treatment

Were fuel loading/ distribution standards met on affected activity areas?

Information sources utilized for Forest fuel monitoring was the Willamette National Forest fuels AFMO's reports. The Forest completed 3,431 acres of fuel treatment in FY2013 or 95% of the assigned target for fuel treatment. The threshold of variability was not exceeded in fiscal year 2013 and the three years cumulative average (2,001 acres) of fuel treatments has not been exceeded. The acres treated were a direct result of timber harvest activities on the forest.

An additional 880 acres of secondary treatments also occurred in FY2013, including 800 acres of treatment in the Wildland Urban Interface.

Biological Resources

The Forest Standards and Guidelines provide direction to enable the Forest to meet the goals of protecting and improving species populations and their habitat. Threatened, endangered, and sensitive species as well as indicator species are monitored for species viability. Below is a summary of FY12 and FY13 monitoring questions designed to assist the Forest Supervisor in determining the effectiveness of the Forest Plan Standards and Guidelines in meeting the Forest's goals.

If the reader is interested in more information than what is provided in the following summary they may request the documents listed under "Supplemental Information".

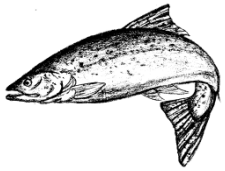
CONTENTS

BIOLOGICAL RESOURCES SUMMARY FINDINGS

Biological Resource	Monitoring Question	Monitoring Activities	Monitoring Results	Supplemental Information
Fish Population	13 - Fish Populations	River monitoring, field observations	Results OK	Fish FY12 & FY13 Monitoring Report
Habitat Diversity	14 - Aquatic Habitat	Field evaluations	Results OK	Fish FY12 & FY13 Monitoring Report
	28, 31 - Riparian & Wetlands	Field evaluations	Results OK	Wetlands Monitoring Report FY12 & FY13
	40 - Biological Diversity	Field surveys and Spotted Owl demographic study	Results OK	Biological Diversity FY12 & FY13 Monitoring Report
Wildlife	15 - Bald Eagle	District surveys	Results OK	Wildlife FY12 & FY13 monitoring report
	18 - Peregrine Falcon	District surveys	Results OK	
	19 - Primary Cavity Excavators	District surveys	Results OK	
	20 - Marten & Pileated Woodpecker	Snag creation and monitoring	Results OK	
	21 - Deer & Elk	Hunter statistics and annual census counts by ODFW	Population stable to declining	

Plants	16 - TE&S Plants, Noxious Weeds, Native Species	Forest and district records and field activities	Results OK	Botany FY11-FY12 monitoring report

Fish Populations



Monitoring Questions 13: Fish Populations

Are the predictions of maintaining or improving Management Indicator Species and Threatened Species of fish valid?

The forest tracks population and habitat changes for spring Chinook, winter steelhead, Oregon chub, and bull trout. The three major river systems on the forest are the Middle Fork Willamette River, the McKenzie River, and the Santiam River.

MIDDLE FORK WILLAMETTE RIVER

Spring Chinook: In 2012-2013 pre-spawned adult salmon were once again released in areas in the Middle Fork Willamette River. Adult salmon are placed in the system to provide nutrient rich sources of biomass and as a food source for a reintroduced population of bull trout. During past years we observed fewer juvenile salmon in the Middle Fork Willamette River. In late fall 2012 and 2013, we released approx.500 adult male, 480 adult female, and 325 jack Chinook salmon. We observed 34 and 27 redds, respectively, during the only surveys completed for the area. This surveys were completed late in the year and we suspect many redds were obstructed or already covered by organic matter and fallen leaves. In addition, we surveyed less than half of the known available spawning habitat in the area. Therefore, we surmise there were many more spring Chinook redds in the Paddy's Valley area then we recorded. This is typical of a normal year where our field crews are stretched too thin to cover all spawning areas and we are forced to concentrate our efforts in the most highly used areas.

Bull trout habitat: The Middle Fork Willamette River bull trout reintroduction, monitoring, and recovery program has concluded its sixteenth year. The program began in 1997, and to date has transferred over 12,000 fry and juvenile bull trout from Anderson Creek, McKenzie River Ranger District to the Upper Middle Fork Willamette River (UMFWR), upstream of Hills Creek Reservoir. Since 1997, there has been a steady, but slow increase in the UMFWR bull trout population, with natural reproduction first occurring in 2004. However, this year's data does not reflect the same slow upward trend. In 2012 and 2013, we observed bull trout habitat expansion and population persistence. However, these observations do not lead us to believe that the population is either failing or becoming increasingly stable.

Bull trout populations: Monitoring: We employ a variety of methods including PIT tag monitoring, trapping, snorkeling, hook and line sampling and spawning surveys. Each method is an integral component to the program as a whole. Since 2004, USFS and ODFW have been

using half duplex passive integrated transponder (PIT) tag technology to monitor the movements of bull trout in the UMFWR. All bull trout >115 mm captured by the various methods listed above have been PIT tagged (Texas Instruments, Inc., half duplex, 23mm) for tracking purposes. We constructed 13 half

duplex PIT antenna arrays (Oregon RFID) at various locations in 2012 and 2013. Ten of these antennas are constructed seasonally (June-November) in the same locations as previous years and three antennas operate year round: Swift Creek, MFWR downstream of Hills Creek Dam at the end of the turbine regulating outlet channel, and a new site in 2013, located on the UMFWR downstream of Forest Service Road 2143 bridge. Antennas at spring sites are paired to provide directionality into and out of the springs.

High use spawning areas in the UMFWR basin were examined for bull trout presence by minnow trapping. Traps were set in Chuckle Springs and Indigo Springs. Minnow traps were baited with salmon eggs and soaked for 20 – 24 hours on average. Meristic data was taken on all fish caught and untagged juveniles >115 mm were PIT tagged before release.

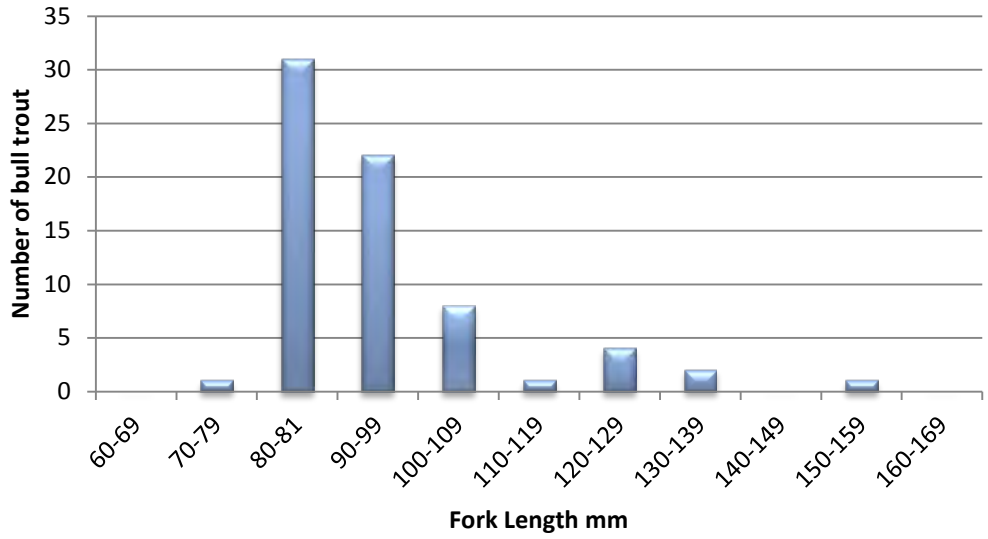
A mark/re-sight (mark and night snorkel re-sight) population estimate was conducted in Iko Springs on May 4-5, 2012. Population size was estimated using the Chapman population model. A channel spanning seine net was placed at the mouth and at the midpoint of Iko Springs to prevent immigration and emigration within the sample area, which also divided Iko Springs into upper and lower reach segments with separate population estimates. Minnow traps were set on consecutive nights in both segments. All captured bull trout were marked with upper caudal fin clips. Night snorkeling re-sight surveys were then conducted 24 hours after initial trapping, all observed clipped and unclipped fish were counted.

Snorkel surveys, redd counts, trapping, and PIT antenna interrogation was used to estimate the number of adults spawning in the UMFWR during 2012-2013. Tagged adults were tracked at PIT tag antenna sites. A five foot rotary screw trap and channel spanning weir was installed downstream of spawning sites in an effort to trap all post-spawned adults returning to Hills Creek Reservoir. Captured bull trout were scanned for PIT tags, meristic data was taken, and fish were released downstream of the trap.

Redd counts were conducted weekly in 2012-2013 in the UMFWR from Sacandaga Campground (RM 256) upstream to the Tumblebug Creek confluence (RM 261) and other spawning tributaries from August 22 to October 12. Redd counts in the UMFWR included bull trout and Chinook salmon redds since both species are present and spawning grounds overlap. All redds in Iko, Indigo and Chuckle springs were assumed to be constructed by bull trout, and bull trout redds in the UMFWR were confirmed only if fish were observed on the redd.

Minnow traps set in Iko Springs during 2013, captured 70 bull trout juveniles in 233 traps (0.3 fish per trap). Size classes in traps ranged from 71 to 144 mm. Minnow traps captured zero bull trout in the fry 0+ size ranges, 25 to 50 mm. Night snorkel surveyors observed a total of

137 bull trout, 20 were observed marked from the trapping effort. Five fry and bull trout over 150 mm were observed. Three bull trout over 150 mm were caught using a net and PIT tagged. One brook trout was observed and netted during the night snorkel in the upper portion of Iko springs and not released back into the system. The length frequencies recorded in Iko Springs suggest that multiple age classes are present (Figure 1).



Twelve adults, (five females, six males, one unknown), 25 sub-adults, and 20 juvenile bull trout were captured at the Forest Service Road 2143 rotary screw trap site in 2012. In 2013, 14 adults, 40 sub-adults, and 17 juveniles were caught in the trap. The first adult bull trout captured was in September for both years. Of the 25 sub-adults captured in 2012, 18 were new captures and seven were previously PIT tagged, four having VI marks (two-green (2008) and two-red (2010)). Twenty juveniles were captured, 12 were newly tagged, three where previously tagged, one having a blue VI mark (2009), and five were too small to tag.

In 2012-2013, we accomplished our monitoring goals by gaining additional information to meet study objectives established for bull trout monitoring in the UMFWR. We met these objectives by estimating abundance and distribution of spawning adults. We continue to work toward completing objectives for estimating population and distribution of naturally occurring juvenile bull trout and continue to monitor the survival and life history of hatchery reared juveniles released into the UMFWR and tributaries.

Adult abundance decreased in 2012 and 2013 from 23 known fish to 17. Adults were present in several tributaries but redds were only observed in Iko Springs, Chuckle Springs, and upstream of Indigo Springs in the UMFWR. Redd counts were unconfirmed in the mainstem UMFWR due largely to Chinook salmon spawning presence and our research suggests that Iko Springs continues to be the only area where consistent bull trout spawning occurs.

Naturally produced fry and juvenile bull trout were observed in Iko Springs. Iko Springs night snorkel surveys suggest that bull trout rear in spring-fed tributaries up to a length of 200 mm. However, smaller juvenile bull trout were captured in the screw trap in the UMFWR. Study objectives are focused primarily on juvenile and adult life stages while sub-adult activities are largely unknown, due to the fact

that sub-adults spend considerable time (years) in the reservoir. Unknown factors or conditions within Hills Creek Reservoir may adversely affect sub-adults during their time in the reservoir. Detrimental conditions such as fishing pressure, blue-green algae presence with associated oxygen level deprivations, reservoir and temperature fluctuations that degrade water quality and foraging or habitat limitations should be considered. Hills Creek Reservoir remains an unknown factor in the status of UMFWR bull trout success and requires further research.

After nearly 16 years of bull trout fry reintroductions and several years of releasing older fish reared in the hatchery prior to release, the 2012-2013 surveys and monitoring work indicates the UMFWR bull trout population remains at a precariously low level. This is the eighth consecutive year the number of adult spawning bull trout has been below 20 individuals. Small reproducing populations are well documented to have many deleterious consequences and in general do not provide long term stable populations. In small populations the probability of inbreeding and genetic homogeneity increases and unfavorable alleles can accumulate in the breeding population. Genetic bottlenecks occur more often and the extinction rate is much higher. Descendants of the reproducing adults must expand their range considerably to avoid deleterious alleles from becoming common in the population. In reintroduction areas such as the Upper Middle Fork Willamette Watershed the ability for the population to expand its range is fairly limited. One of the areas the UMFWR population will likely expand is downstream of Hill Creek Dam.

MCKENZIE RIVER

Spring Chinook: Restoration efforts by partners in the sub-basin focus on factors found limiting to spring Chinook production, and those projects range from historic temperature regime restoration and passage at Cougar Dam (Cougar Temperature Control Project and fish passage facilities completed in 2010 by USACE) to restoration of aquatic habitat (McKenzie River and South Fork McKenzie River by USFS). Of the effects that are believed substantial in the sub-basin, the long term presence of the McKenzie River Hatchery program is thought to be significant. Changes in spring Chinook stock management by ODFW toward natural production, especially above dams, will be monitored by USACE and ODFW for effectiveness in future years. Changes in life history due to the altered thermal regime or changes in the juvenile migratory corridor and downstream rearing habitat are thought to be significant in the lower sub-basin (non-Forest Service land) but could not be estimated due to lack of information.

Partners continue to address limiting factors within the sub-basin.

In 2011 the McKenzie River Ranger District implemented Phase 2 of a 3 phase project to add large woody material in the form of whole trees to 4 side channels in the McKenzie River. Phase 1 of the project was implemented in 2010 and monitoring has shown that large wood has created deeper pools in the side channels, and increased spawning area. During calendar year 2010 in one side channel we observed 8 redds before project implementation. In 2011, after project implementation, we observed 34 redds in the same side channel. This is attributable to the increased amount of spawning habitat that was created due to the large wood project.

Willamette Basin dams USACOE operations must now address a 2008 Biological Opinion. Of high priority are issues of habitat connectivity above dams and of highest priority within the McKenzie sub-basin is reconnecting the South Fork McKenzie River. The USACE is has completed a "trap and haul" facility at Cougar Dam and is transporting spring Chinook salmon (and other native fish) to upstream habitats. In 2011, ODFW released adult spring Chinook salmon from the McKenzie River Hatchery upstream of Cougar Dam in the South Fork McKenzie River as well as fish caught in the trap. The goal of these releases is to restore marine derived nutrients to the South Fork McKenzie watershed upstream of the dam, and so that the progeny of spring Chinook provide a prey base for bull trout isolated upstream of the dam.

In 2011, members of the McKenzie River Ranger District, ODFW, NMFS, and the USACE reviewed current release sites for adult spring Chinook salmon, and potential new release sites upstream of Cougar Reservoir. In 2012 we expect to select sites and prepare any needed environmental documentation.

Phase 2 of a multi-year project was completed in 2011 in the McKenzie River and expects to improve conditions for spring Chinook and bull trout.

Bull trout habitat: In 2011, the USFS completed Phase 2 of a project to restore large woody material to 3 miles of side channels in the "middle" McKenzie River corridor. Phase 1 consisted of pulling over 22 stream-adjacent trees into the 2 side channels to provide key pieces on which to build log accumulations via helicopter (Phase 3). In Phase 2 we pulled over 15 trees into 4 additional side channels. This project is expected to increase rearing and foraging habitat and prey base for bull trout.

Bull trout populations Redd counts in 2011 there was an increase by 10 redds in the mainstem McKenzie River sub-populations. Some evidence shows that illegal harvest, natural predation and passage issues at culverts may have played a role in the decline. Redd counts in 2011 for the South Fork McKenzie River sub-population, declined by 9 redds but overall the populations trends are favorable. Habitat restoration projects were conducted in 1996-1998 and 2007-2009 in the South Fork McKenzie River and Roaring River and may be contributing to increasing redd counts. Trap and haul facilities at Cougar Dam were completed in 2010 and will benefit the South Fork McKenzie River sub-population. A fish ladder is planned at Trail Bridge Dam by the Eugene Water & Electric Board (EWEB)

and will be completed within 6 years of receiving a new hydropower license. EWEB expects to receive their license in 2012.

SANTIAM RIVER

Spring Chinook: There has been no monitoring in the North Santiam River, Little North Santiam River, South Santiam River or the Calapooia River that would indicate whether smolt numbers are increasing, decreasing or are stable. Smolt trapping began in both the Breitenbush River and the North Santiam River, in 2010. ODFW is still trying to coordinate plans to identify a way to monitor smolts on the South Santiam river. The chart below shows returning adult spring Chinook in the South Santiam River since 1984.

The North Santiam trap operated from January through December 2011 and collected 4294 subyearlings and 29 yearling spring Chinook salmon. The Breitenbush River trap was operated from February through December 2011. 3 yearlings and 1050 subyearlings were collected. An additional trap was installed below Detroit Dam to monitor out-migrants from the reservoir and survival rates. Overall the survival rate through the dam is very poor. Of 168 chinook captured only 63 were alive. There appears to be a direct correlation between size and mortality rate. The larger the smolt, the less likely it is to survive. In the North Santiam River, hatchery supplementation and natural spawning of Chinook moved around Big Cliff and Detroit Dams but at a much lower rate. Due to construction of the new Minto Fish collection site the 2011 collection occurred at Bennet Dam, located 25 miles lower in the watershed. Only 200 individuals were transported above the dams this year and the pre-spawn mortality rate of those fish was very high.

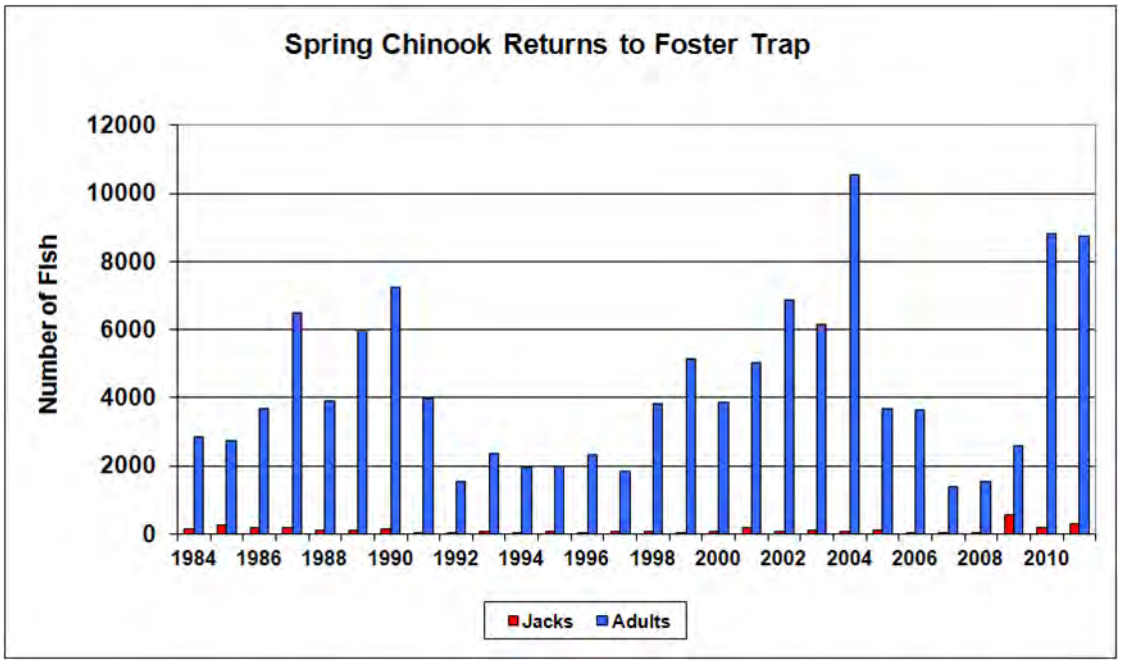
Monitoring also occurred within Detroit reservoir. Live traps were located at various locations throughout the reservoir. The population of non-native pumpkinseed is expanding at a phenomenal rate.

Construction of the new collection and sorting facility at Minto Park is currently on schedule, completion anticipated 2013. This facility will dramatically improve the ability of ODFW personnel to capture and transport adult salmon, hopefully reducing the high incidence of pre-spawn mortality of out-planted adults in both the Breitenbush and North Santiam Rivers. The USGS is installing additional acoustic sensors at various locations in Detroit Reservoir to monitor juvenile Chinook salmon implanted with transponder tags. This projects goal is to determine migration routes and depths used by juvenile salmon through the reservoir pool. The Army Corps continues to work with ODFW to improve stream temperatures below the reservoirs to improve fish habitat. Stream temperature models were developed by the Oregon Department of Environmental Quality to assist in this project. Utilizing historical records prior to dam construction as well as data collected from monitoring stations above the reservoirs the DEQ has produced a water temperature seasonal profile.

ODFW is still trying to coordinate plans to identify a way to monitor smolts on the South Santiam river. The chart below shows returning adult spring Chinook in the South Santiam River since 1984.

Upper Willamette Winter Steelhead (UWS): UWS have been extirpated in the North Santiam River above Big Cliff Dam. Steelhead that reach the Minto (this year Bennet) trap, operated by ODFW, are passed around the collection facility and spawn naturally in the North Santiam River below Big Cliff Dam. In the Willamette Basin Biological Opinion winter steelhead may be moved around these dams in the North Santiam River. Downstream smolt migration would be monitored by the ACOE and ODFW.

There may be an indication that winter steelhead smolt numbers in the South Santiam River may be fluctuating based on the variability of numbers of adults returning to the South Santiam River the last several years. Annual snorkel surveys for juvenile steelhead have been initiated on Moose Creek and over time the data collected from those surveys will increase our understanding of the population. The chart below shows returning adults of UWS in the South Santiam. UWS have been extirpated in the North Santiam River above Big Cliff Dam. Steelhead that reach the Minto trap, operated by ODFW, are passed around the collection facility and naturally in the North Santiam River below Big Cliff Dam. In the Willamette Basin Biological Opinion winter steelhead may be moved around these dams in the North Santiam River. Downstream smolt migration would be monitored by the COE. Downstream smolt migration would be monitored by the COE.



Bull trout habitat: Bull trout have been extirpated above Detroit reservoir following the construction of the dams. Current sampling and survey efforts to determine feasibility of

reintroduction have found Brook trout to be present in the headwaters of the North Santiam and near the Wilderness boundary on the Breitenbush.

Oregon Chub: Oregon chub habitat areas on the National Forest are being maintained. The evidence of this finding is a stable trend in chub populations on the Forest.

Stable or increasing trends in abundance for several streams on the Forest.

Since Oregon chub were federally listed in 1993, they have made a remarkable recovery throughout much of their historic range. The Oregon chub populations have now exceeded the recovery goals and were proposed for delisting in 2014 but the U.S. Fish & Wildlife Service. There are several populations on the Willamette National Forest that currently meet Endangered Species Act down-listing criteria of greater than 500 fish with a stable or increasing trend of abundance for at least 5 years. These trends did not change in 2012 or 2013.

The Oregon chub project is a District-wide monitoring effort to establish O. chub populations, employing sampling protocols developed by ODFW. Each year, the MFRD fisheries department monitors eight historically and currently occupied sites, located on National Forest lands (Figure 2). Seven of these habitats are found on the

MFRD and one reintroduction site (Herman Pond), located within the Coast Fork Willamette sub-basin, on the Cottage Grove Ranger District.

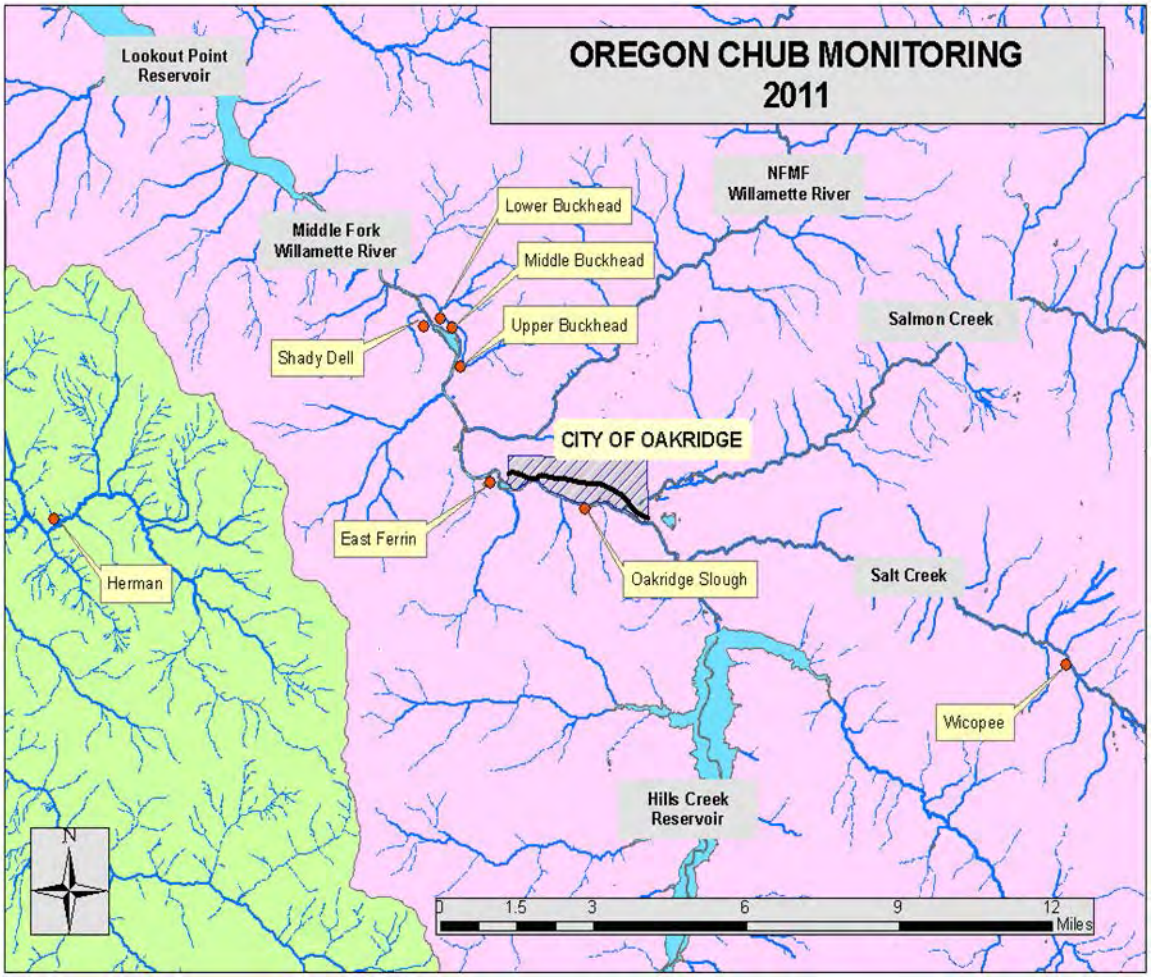


Figure 2. Oregon chub sites monitored by MFRD fisheries biologists in 2012-2013.

Monitoring Questions 14: Riparian Aquatic Habitat and Streambank Stability

Are Standards and Guidelines for Water Quality and Riparian Areas effective in maintaining or enhancing stream conditions and aquatic habitat?

Stream survey data collected over the last 10 years indicates that in-stream habitat is being maintained/enhanced by Forest Plan S&G's. Stream habitat attributes such as instream large wood, large pools, and bank stability are generally improving. There are stream reaches in need of in-stream and/or riparian restoration. The Respect the River program has been implemented in the North and South Santiam watersheds to protect and restore riparian habitat. These areas are prioritized and restoration occurs as funding allows. The Respect the River program will expand across the Forest in 2012. See Monitoring Question 13 for more discussion on accomplishments and work planned for the future.

Monitoring Questions 28 & 31: Riparian Terrestrial Habitat and Wetlands

Are riparian Standards and Guidelines effective in meeting Forest Goals for terrestrial riparian resources including beneficial values of small wetlands?

Riparian areas are being protected.

No formal monitoring was conducted for riparian terrestrial habitat in FY11; however, riparian area protection and restoration was completed on the north end of the forest with implementation of the Respect the River program. In addition, Forest Supervisor monitoring trips focus on new project including those that may affect riparian areas. Monitoring completed in FY11, showed overall physical protection of channels appeared to be successful. Providing flexibility in reserve boundaries to meet site-specific conditions such as aspect, topography, and vegetation would further enhance protection.

Protection given through the NWFP for riparian and wetlands areas maintains the quality and diversity of these areas beyond the Forests' original expectations. Add to that Respect the River, which is managing recreation impacts, protecting riparian habitat and actively restoring riparian areas, and riparian areas on the forest are being moved towards restoration.

Wildlife

Monitoring Questions 15: Bald Eagle

Are the bald eagle recovery objectives being met on the Forest?

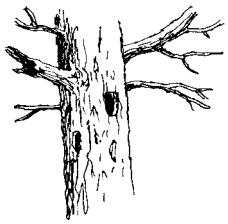
Yes. The recovery of the bald eagle and current management under the sensitive species program were described in the 2011 Forest Monitoring Report. Eleven nesting sites on the Forest were monitored for use in 2013. One nest was documented producing a total of 2 nestlings older than 4 weeks of age. The other nests did not produce any young. The reason for the low production for eagles on the Forest in 2013 is unknown. A possible new nest site on the Detroit Ranger District had activity by adults that suggested nesting, but a nest tree was not located.

Monitoring Questions 18: Peregrine Falcon

Are the objectives for peregrine falcon recovery being met on the Forest?

Yes. The recovery of peregrine falcon and current management under the sensitive species program were described in the 2011 Forest Monitoring Report.

The U.S. Fish and Wildlife Service (USFWS) implemented a 13-year (2003-2015) nationwide plan to monitor nesting success of peregrine falcons after delisting. The Willamette NF has 32 known nesting sites. Seven of these nest sites are included in the 2003 National Monitoring Program and are monitored annually. Other nest sites are monitored based on district needs and available funding. Seventeen sites were successfully monitored in 2013. Of the 17 sites monitored, 18 young were produced from 12 occupied sites for an average of 1.5 young per occupied site. Of the 7 national monitoring sites successfully monitored, 4 sites were occupied of which 3 were successful, each producing a single young.

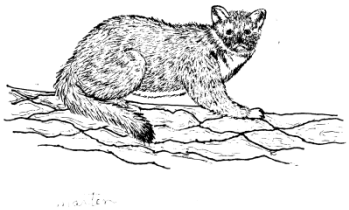


Monitoring Question 19: Primary Cavity Excavators

Is adequate amount, quality, and distribution of snag habitat being maintained to ensure viable populations of cavity nesting species?

Each year some monitoring of harvest units to determine whether the number, size, species, and distribution of wildlife trees are retained after harvest as prescribed in the accompanying Environmental Assessments is conducted on the districts. Some units are also monitored to determine if there is a need to create snags after logging. Lack of funding, time lost due to the furlough (shutdown of government), and higher wildlife priorities prevented compiling annual forest-wide monitoring results for 2013. Because timber harvest practices have shifted from clearcutting old forests to thinning younger stands, large numbers of green trees are left, in addition to specific wildlife trees, which help provide habitat for cavity nesters and future sources of downed logs.

Snags are created annually using a variety of methods, such as tree topping, girdling, top blasting, and/or inoculation to create cavity nesting habitat generally in connection with timber sales. In 2013, 3541 snags were created in commercially thinned stands and adjacent forests on 4 districts at a density ranging from one to several snags/acre. The density of snags created is often depended on the number of snags found present after logging. Snags are also created incidentally by prescribed broadcast burning some units after thinning. Downed logs may be fallen to increase this deadwood component. Two districts created downed wood in harvest units in 2013 by falling total of 933 trees at a density of 1-2/acre after logging. Most of the snag and downed log creation for wildlife is accomplished with KV funds.



Monitoring Questions 20: Marten & Pileated

Is there an adequate amount, quality, and distribution of mature or old-growth forests to maintain viable populations of species dependent on this successional stage of forest habitat?

Upon adoption of the NWFP, the pileated woodpecker and marten networks were reevaluated and nodes of habitat were maintained or dropped in order to provide connectivity between large LSRs. The LSRs were expected to provide adequate habitat for both pileated woodpeckers and martens. Snag and downed log creation occurs throughout the forest in connection with timber sale mitigation using primarily KV funds. These measures enhance habitat for both pileated woodpeckers and marten. As a result of major changes in how pileated woodpeckers and marten are managed under the NWFP, changes are recommended to this monitoring section during Forest Plan revision.

Marten and pileated woodpecker management areas are protected from timber harvest according to Forest Plan Standards and Guidelines. The 2011 forest monitoring report described the composition of older forests on the Willamette as a whole and within pileated woodpecker and marten management areas. About 68% of the forested land on the Willamette NF is 80 years or older and about 37% is more than 200 years old.

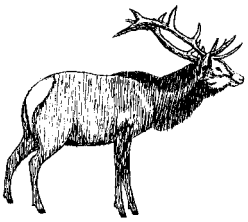
Beginning in FY13 and continuing in FY14, inventories for wolverine, Sierra Nevada red fox, and other carnivores are being conducted jointly with Oregon Department of Fish and Game using baited camera stations and hair snares (Hiller and McFadden-Hiller 2013). This work is providing information on the distribution and abundance of marten on the Willamette National Forest. The Forest Plan established marten management areas, designated as 9c areas, at strategic locations across the entire forest including lower elevation Douglas-fir habitat. The recent monitoring work is suggesting that, on the Willamette NF, marten are primarily restricted to the montane mixed conifer above about 4000' elevation, and that all, or nearly all, of that suitable habitat is occupied by marten. This finding is consistent with some other studies suggesting marten are primarily restricted to high elevations in the Cascades (Aubry and Lewis 2003, Marcot et al. 2003). In contrast, fisher, another mustelid in the genus Martes, likely historically occupied the lower elevation forests and may have been extirpated on the Willamette National Forest sometime near the end of the 1940's (Kebbe 1961, Aubry and Lewis 2003). Further Forest Plan revisions will need to consider the latest information on habitat selection of these two Martes species, the likelihood of reestablishing fisher on the Forest, and potential effect of climate change on the ecology of these two species.

Aubry, K. B., and J. C. Lewis. 2003. Extirpation and reintroduction of fishers (Martes pennanti) in Oregon: implications for their conservation in the Pacific states. Biological Conservation 114: 79-90.

Hiller, T. L., and J. E. McFadden-Hiller. 2013. Wolverine-forest carnivore research in the northern Cascades of Oregon, final progress report for field season 1 (Oct 2012–May 2013). Oregon Department of Fish and Wildlife, Salem, OR. 8 p.

Kebbe, C. E. 1961. Return of the fisher. Oregon State Game Commission Bulletin 16: 3-7.

Marcot, Bruce G., Barbara C. Wales, and Rick Demmer. 2003. Range maps of terrestrial species in the Interior Columbia River Basin and northern portions of the Klamath and Great Basins. PNW-GTR-583, USDA Forest Service, Pacific Northwest Research Station, and USDI Bureau of Land Management, Portland, OR. 304 p. http://www.fs.fed.us/pnw/publications/gtr583/



Monitoring Questions 21: Deer and Elk

Are habitat effectiveness values for cover quality, forage quality, open road density, and size and spacing of food cover being increased or maintained as established for each emphasis level?

The recent elk and deer habitat management situation on the forest was addressed in the 2011 forest monitoring report. That report documented the decline in deer and elk numbers and hunting success since the implementation of the Forest Plan and evidence linking this decline to a decrease in the quality and quantity of forage on the Forest.

Specific enhancement projects are implemented each year to benefit elk and deer habitat. About 5,830 acres of accomplishments were reported in 2013 that benefitted elk and deer habitat. These projects include 39 acres of gap creation with commercial timber harvest, 600 acres of weed treatment, 900 acres of meadow restoration and prescribed burning, over 2000 acres enhanced with road closures, 84 acres of savannah restoration, and 1370 acres of other forage enhancement projects, including seeding and browse cutback. Several hundred miles of existing gated roads were inspected and gates and locks were maintained to provide increased habitat security. Many projects to improve elk and deer habitat are done with outside partners, including the Rocky Mountain Elk Foundation, Oregon Hunters Association, Oregon Foundation for Black-tailed Deer, Mule Deer Foundation, and the Oregon Dept. of Fish and Wildlife.

Monitoring Questions 40: Biological Diversity

Is biological diversity being maintained or enhanced on the Forest?

In December 2011, Region 6 updated its list of Sensitive Species and developed a new list of Strategic Species. These species, together with federally listed and proposed species comprise the current list of Forest Service "Special Status Species". There are now 7 insects, 2 mollusks, 10 birds, 1 amphibian, 1 reptile, and 5 mammal Sensitive Species suspected or documented on the Willamette National Forest. One bird and 8 invertebrate species that are classified as Strategic are also suspected to occur on the Forest. There are also 16 fungi, 31 bryophytes, 8 lichens and 43 vascular plants on the sensitive list, and 46 fungi, 21 bryophytes, 12 lichens, and 1 vascular plants on the Strategic list. The Forest provides habitat for one federally threatened bird, 1 federally endangered fish, and 3 federally threatened fish. One former sensitive species, the Oregon spotted frog, is now listed as a proposed threatened species. Effects to federally threatened and endangered and Forest Service sensitive species were evaluated for each proposed project. In FY 2013, 70 project-level Biological Evaluations or Assessments were conducted to address effects and identify mitigation measures for these species. There were 7 formal and 6 informal consultations on project effects with the U. S. Fish and Wildlife Service or the National Marine Fisheries Service. Six hundred seventy three thousand three hundred and twenty seven acres of the Willamette National Forest, including 223,539 acres in matrix, were designated as critical habitat for northern spotted owl habitat by U. S. Fish and Wildlife Service in FY13.

One abandoned mine on the Detroit Ranger District was closed with a bat gate and the Middle Fork Ranger District constructed an experimental bunker for Townsend's big-eared bats at a facility site. We partnered with Northwest Youth Corps to complete cutback of trees and shrubs around *Frasera umpquaensis* population in decline at Nevergo Creek on the Middle Fork Ranger District. Specific inventory and monitoring surveys were conducted on the Forest for the bald eagles, peregrine falcons, bats, harlequin ducks, wolverine, Sierra Nevada red fox, western bumblebee, and California shield-backed bug under the Regional Special Status Species Program. Botanists monitored 19 sensitive plant populations across the Forest and set up 4 permanent transects for *Calamagrostis breweri* at Jefferson Park, a heavily used recreation area, in Mt. Jefferson Wilderness. The northern spotted owl demographic study was continued on the HJ Andrews Demographic Study area. Additional surveys for Special Status Species were conducted at the project-level. Potential habitat for sensitive species habitat is often buffered from activities in lieu of surveys. The Forest ended their hosting of the Region 6 Center of Excellence for Bats with the retirement of Pat Ormsbee in the fall of 2012.

About 16,093 acres of terrestrial habitat were enhanced for native wildlife and plant species using a combination of designated, integrated, and partnership funding and in-kind support.

These projects included road closures, native seeding and browse planting, thinning to increase diversity, browse cutback, maintaining forage openings, prescribed fire, off-road weed treatments, snag and downed log creation, bat house and nest box construction, water developments, and construction of brush piles. Key benefitting species include elk, deer, cavity excavators/users, terrestrial amphibians, bats, northern spotted owl and quail.

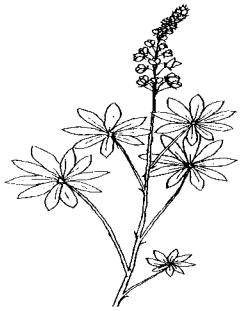
New Monitoring Question: Survey and Manage

Have surveys been conducted for Category 2 survey and mange species for all habitat-disturbing activities?

In 1994, the Northwest Forest Plan listed specific species for special protection. The January 2001 Record of Decision and Standards and Guideline for Amendments to the Survey and Manage, Protection Buffer and other Mitigation Measures Standards and Guidelines refined and clarified the direction to survey and manage for rare and uncommon species associated with late successional forest habitat. Known sites of these species should be managed for their protection and surveys are to be conducted for selected species whose habitat is planned for ground-disturbing activity. These "survey and manage" provisions provide benefits to amphibians, mammals, bryophytes, mollusks, vascular plants, fungi, lichens, and arthropods. Surveys are completed before any habitat disturbing activity. Some projects protect the habitat of Survey and Manage species by buffering their habitat in lieu of surveys. Due to lack of funding for monitoring, the acres surveyed for the wildlife "survey and manage' species in FY13 are not quantified in this report.

Botanical surveys were conducted for survey and manage species on 6411 acres in 2013. These surveys resulted in locating 37 new populations of lichens and bryophytes on the Forest. All populations are scheduled to be buffered from impacts from management activities except *Ramalina thrausta*, which is locally abundant and may not require every plant to maintain viability in the project area. This analysis will be completed in the Environmental Assessment process and will be subject to public review.

Plants



Monitoring Question 16: Threatened, endangered, and sensitive plants

Have populations of all threatened, endangered, and sensitive (TE&S) plants been inventoried, and are these plant populations being maintained at viable levels?

Were surveys conducted for all ground-disturbing projects?

Surveys were conducted on over 6567 acres in 2012 and 6411 in 2013 for projects ranging from timber sales to new trail construction for Regional Forester's Sensitive plants as well as Survey and Manage botanical species and noxious weeds. An average of twenty-five Biological Evaluations was written each of these years to document effects on sensitive species. Fifty-six new sensitive botanical species (including vascular plants, lichens, bryophytes and fungi) were located during surveys over the 2 year period.

SENSITIVE PLANT MONITORING AND RESULTS

District Botanists monitor the health of sensitive plants on their Ranger Districts as part of the Threatened, Endangered and Sensitive plant program. In 2012, 20 different locations were monitored and eighteen in 2014. Monitoring can range from checking that plant populations are still in the area to actual counting of individuals within a population (Table 1). A large number of plants were monitored as a training exercise for new field crew members in 2013.

Most populations of sensitive plants monitored are stable, largely due to the fact that we routinely buffer populations from management activities. However, there seem to be some trends in reduction of species in the family *Ophioglossaceae*, the *Botrychiums* and *Ophioglossum pusillum*. These species are closely tied to a moist hydrologic regime. Changes in overall amount of water and timing due to climate change could be adversely affecting these species. It is unknown what management activities we could take to improve habitat for these species; we may be witnessing natural extinctions as habitat moves northward.

The other species that is in decline is an outlier population of *Frasera umpquaensis*. The population has been in decline for several years, reproduction has been nil, and we have worked with Eugene BLM and Institute for Applied Ecology in determining what part of the life cycle the plant is vulnerable. Research shows us that when flowering occurs, viable fruit develop. Some transplanting of seedlings has been unsuccessful, so this seems to be the life stage at risk. To aid this species, we have done some rather radical thinning so at to promote additional flowering and create more open spaces for seedlings (see figures)

Figures 1 and 2. Before and after tree removal at the Nevergo Creek site for *Frasera umpquaensis*. We hope that more light will lead to additional reproductive effort.

Species Name	Results
Arabis hastatula	Population stable.
Botrychium minganense	19 individuals at original Burnside site; 13 individuals at 2011 site (stable); declining in 2013
Botrychium montanum	Two sites monitored; 4 individuals at Browder and 10 at Single Creek. Both populations appear to be in slow decline.
Bridgeoporous nobilissimus	Owl Ridge site: conk (1) present and growing; Cool Camp stable Population relocated
Calamagrostis breweri	Relocated the known site of in Jefferson Park and installed 4 permanent transects as recommended in the Conservation Strategy: 2 near camping areas and 2 near social trails. Surveyed possible habitat throughout Mt. Jefferson Wilderness but found no more sites
Corydalis aqua-gelidae	Stable
Eucephalis vialis	Stable
Frasera umpquaensis	Re-read monitoring plot data. Population not reproducing and in decline.
Gentiana newberryi	Population were in bloom and stable..
Lathyrus holochlorus	Population is intact and was not brushed by road brushing contract that was on the same road this year.
Lewisia columbiana var. columbiana	Both known populations are doing well. We also found another population close to the tumblebug population that is bigger than either of the previously known sites on the Middle Fork.
Lobaria linita	Stable
Lycopodiella inundata	Stable
Ophioglossum pussilum	Deer Creek population monitored by EWEB as part of the Carmen-Smith relicensing. Population stable. Salmon Creek site seems to be decreasing in number. Invasive species are growing adjacent to the site and were pulled. Whiterock population declining.
Pseudocyphellaria mallota	Relocated

Species Name	Results
Ramalina thrausta	Found tag and location but could not find population.
Rhynchospora alba	Stable
Romanzoffia thompsonii	Population was thought to have been impacted by Bridge Thin timber sale activities. Unit was dropped, but timber from unit below was skyline yarded adjacent to ROTH population. The population was avoided; therefore, harvest activities had no effect. Populations stable.
Scheuchzeria palustris	Stable
Utricularia minor	Population is healthy and there are no new threats to the site.
Woodwardia fimbriata	Two different sites were monitored this year. Both sites are on the edge of roads and susceptible to road maintenance activities. Both sites were intact and healthy.

Lewisia columbiana var. columbiana is a rare species found at 3 locations on the Willamette NF

One of the sensitive plant species we are most worried about is *Calamagrostis breweri, Brewer's reedgrass*, who's only known population on the Willamette NF is in Jefferson Park, a heavily used recreation area in Mount Jefferson Wilderness. The main natural threat to species persistence is habitat loss. Climate change has had an impact on snowpack and hydrology (in fact researchers are already documenting survival of many more trees) because habitat is restricted to high elevation parkland. A Conservation Strategy was completed for this species in 2011; it proposed

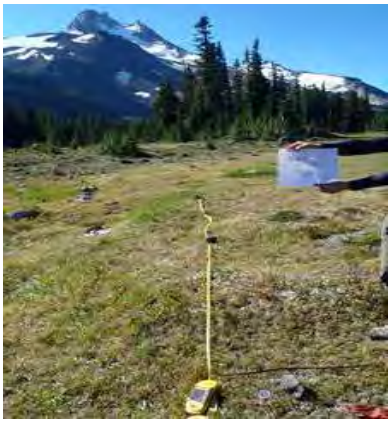


Figure 4. Monitoring transect for *Calamagrostis breweri*, summer 2013

setting up 4 permanent transects to assess the effect of recreational pressure on the species (figure 4).

Another interesting high elevation species that was recently added to our sensitive list is *Pinus albicaulis*, Whitebark pine. Stands are restricted to above 6000 feet in elevation and are often riddled with white pine blister rust. We plan to investigate the status of known populations in summer 2014.

Monitoring Questions 40: Biological Diversity

Is biological diversity being maintained or enhanced on the Forest?

The Willamette National Forest is a biologically diverse forest. Restoration projects being done to maintain and enhance biodiversity are listed below. Several meadows are being actively managed in partnership with many outside groups.

Outerson Mt. Meadow enhancement: pulled weeds from three meadows and pruned trees for huckleberry enhancement with North Santiam High crew and contractors (Detroit RD)

Iron Mountain: pulled St. Johnswort from *Romanzoffia thompsonii* meadows and grew out seedlings for restoration of *Arabis hastatula,* a rare mustard whose habitat was impacted by removal of a fire lookout, with the Plant Conservation Program at Portland state University (Sweet Home RD)

Completed Calapooia I, Mule Meadow and Calapooia II Meadow Enhancement Projects: Whipfelled and piled 20 acres at Gertrude Lake, Cedar, Staley and Quail Meadows using fire crews early in field season and completed prescribed burn at Groundhog Meadow and Mule Meadow in the fall (Middle Fork RD)

Camas Prairie: completed a 7th prescribed burn for enhancement of Camas in partnership with the Siletz and Grand Ronde Indian Tribes (Sweet Home RD)

And we are monitoring the success of our terrestrial restoration efforts:

Browder Ridge Meadow Enhancement: Permanent plots were installed several years ago prior to any burning, focusing on conifer tree islands. The goal was to determine changes in species composition after the area was burned. Four plots were remeasured 2-4 years after they were burned. Results varied widely, from complete recovery of meadow species in consumed tree islands, to carpets of conifer tree seedlings establishing in consumed tree islands.

We have compiled the results of monitoring in meadows for the forest and this information needs to be synthesized and prioritized so that we do not miss out on restoration opportunities in planning areas or with partners.

We have also been spending a deal of money on huckleberry habitat enhancement and would like to start monitoring effectiveness of pre-commercial thinning on berry production. The Mt. Hood National Forest has developed a subregional protocol for plot-based and photo monitoring that we could adopt to make monitoring efforts regional.

New Monitoring Question: Noxious Weeds

Are noxious weeds being treated on the Forest? Are surveys being conducted for weed populations and are partnerships being developed?

In 2012, over six thousand acres of invasive plants were treated on the Willamette National Forest using manual, mechanical and chemical control methods. Title 2 funded false brome treatment with Middle Fork Willamette Watershed Council, blackberry/Scotch broom treatment in Mule Meadow Restoration Project and hundreds of other acres using the Linn County Youth Crew and our Youth Conservation Corps crews. Title 2 also funded a great deal of road maintenance, some of which counted as mowing of our weed populations. In 2013, we treated only 4500 acres due to a significant decrease in Title 2 funds and reductions in NFF funds which affected integrated targets. However, an MOU with Oregon Department of Transportation meant that they treated more highway corridor acres- major weed travel routes- than they had in the past.

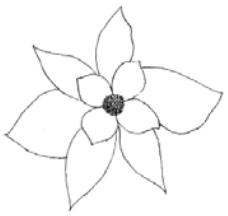
Figure. Edge between treated and untreated false brome in forested understory at Foley Ridge. McKenzie River District

Despite our reduction in funding, we still manage to conduct some prevention and survey activities. We worked with Marion County, Marion SWCD and North Santiam Watershed Council on a weed outreach program to residents of Idanha and Detroit in 2012. We surveyed 65 properties for state-listed weeds and hosted a weed identification training. The purpose was to educate owners of private inholdings on detection and control techniques for weedy species so they don't spread on to adjacent Forest Service land. In 2013, our Oregon Department of Agriculture partners helped us with a survey of

knotweed populations in the Middle Fork Willamette River, mapping all remaining populations and identifying their proximity to water.

We have fully integrated weed surveys into botanical surveys completed for all projects. We are able to treat our most high priority species using an early detection, rapid response methodology.

The one area we are struggling with weed treatment is riparian areas. The current Environmental Assessment allows us to treat with certain herbicides to within 10 feet of water. We have a few locations where manual control is not effective in riparian corridors and populations are spreading. We will be analyzing very small scale, localized herbicide treatments in riparian corridors during 2013-14.



New Monitoring Question: Native Species Revegetation

Is the Forest using native seed for restoration projects across the Forest?

Issues we continue to address include integrating use of native species and weed-free straw for all revegetation purposes and the unpredictable nature of the budget, making outyear plant material needs difficult to forecast. There is a new timber sale C- clause we are hoping to implement on the Willamette that would allow us to collect for native seed for erosion control and noxious weed competition on timber sales. This would give the program a good stable basis.

We grow common native grass species via contract; anyone that needs seed for a project can access it. We produce between 3500-4000 pounds of blue wildrye and between 2-3000 pounds of California brome/year via contract. In addition, if specific programs such as wildlife forage seeding or federal byway upgrades get special funds, they will buy grass seed for use on those project areas. Native grass seed is used on a variety of projects from wildlife seedling in created openings in the forest to revegetation along roads that are closed in timber sales. We have produced or bought native plant materials for riparian restoration sites and to landscape District offices in the last year.

We know the seed is getting out on the ground, but we don't know how much non-native seed is being broadcast (there are some non-native seed mixes being put in contracts) or whether it is effective in achieving desired results. Some Forest Plan project monitoring has shown mixed results because seed was broadcast mid-summer when the sale closed rather than in the fall. This should be an area we focus on monitoring in FY14-FY15.

Resources and Services to People

This section of the monitoring report describes the resources and services the Forest provides its constituents. Recreation, timber, and roads provide direct benefits to many users of the forest. Benefits from other areas such as the cultural resources and research natural areas provide a more indirect benefit designed to assist the Forest Supervisor in determining the effectiveness of the Forest Plan Standards and Guidelines in providing expected resources and services to our constituents.

If the reader is interested in more information than what is provided in the following summary they may request the documents listed under Supplemental Information.

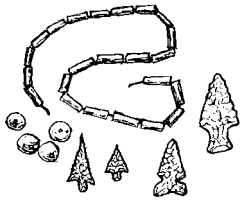
CONTENTS

RESOURCES AND SERVICES TO PEOPLE SUMMARY FINDINGS

Resource	Monitoring Question	Monitoring Activities	Monitoring Results	Supplemental Information
Cultural Resources	2 - Cultural Resources	Site visits	Results OK	Heritage FY10 monitoring report
Specially designated unique areas	3 - Wilderness	District reporting, on-site visits by district personnel	Results OK	Recreation FY12 & FY13 monitoring report
	4 - Wild and Scenic Rivers		Results OK	
	5 - Roadless Areas		Results OK	
	9 - Special Interest Areas		Results OK	
	39 - RNAs	Site visits and scoping	Results OK	RNA FY12 & FY13 monitoring report
Recreation	6 - ROS	District reporting, on-site visits by district personnel	Results OK	Recreation and Scenic FY12 & FY13 monitoring report NVUM Survey FY12.
	7 - Recreation Visitor Use		No new results until 2008	
	8 - Scenic Resources		Results OK	
	10 - Trails	District reporting, site visits	Limited results	Trail FY12 & FY13 monitoring report

Resource	Monitoring Question	Monitoring Activities	Monitoring Results	Supplemental Information
	11 - Developed Recreation	District reporting, on-site visits by district personnel	Results OK	Recreation FY12 & FY13 monitoring report
	12 - Off-road vehicle use		Results OK	
Timber	22 - Timber Suitability	Review of land allocation changes	No new results	No longer reported
	23 - Timber Program	Review of timber records	Results OK	Timber records
	24 - Silvicultural Practices	Review of silvicultural records	Results OK	Silvicultural records
Transportation	38 - Transportation System	Reports, databases, traffic counts	Results OK	Transportation FY12 & FY13 report

Cultural Resources



Monitoring Questions 2: Cultural Resources

Are significant cultural resources being managed and protected consistent with the Forest Plan direction and law?

The Forest cultural resource inventory now reflects a resource base of over 3000 recorded cultural resources including archaeological and historic sites, structures, trails and transportation routes, as well as a multitude and variety of other features and isolated finds, as well. Through a variety of program efforts, the Forest is managing and protecting these sites consistent with the Forest Plan direction and applicable federal law. Archaeologists are involved at all levels of project planning to ensure that cultural resources and historic values are considered. About 11,500 acres were surveyed for cultural resource during the recent 2 year reporting period: 4760 acres in FY12 and 6700 acres in FY13. One-hundred forty previously undocumented cultural resource sites were discovered, recorded, and protected, primarily in the course of pre-project implementation field surveys conducted under the auspices of Sec 106 of the National Historic Preservation Act. About 20 of these were located during Section 110 surveys that were not related to other proposed Forest Service projects. Protection by avoidance or project redesign is typically recommended for sites discovered or monitored in conjunction with project planning. When those options

are not feasible, adverse effects would be mitigated through scientific recovery and preservation of the data embodied in the historic property.

During FY10, Heritage staff reported monitoring visits to 51 sites, which represents about 2.4 % of the total inventory of known sites. These monitoring visits occur most often in conjunction with proposed project surveys or as follow-up to recent projects. Several sites were monitored in conjunction with heritage hikes and projects, and some with representatives of local tribes. Typically when a site is monitored, site records are updated as needed with current narrative information regarding condition, photo documentation, and often GPS data collected.

At most sites visited, no significant new impacts were reported, and most sites were found to be in good-to-fair condition. Impacts noted at individual sites were either minor or were existing damages that had been noted in the past, for example past logging or road construction, though some more recent impacts related to Off-Highway Vehicle (OHV) use were noted. Such past damages are often compounded by the cumulative effects of nature resulting in erosion. Some incidents vandalism and unauthorized artifact collections were noted but were relatively minor and would not constitute a violation under the Archaeological Resource Protection Act (ARPA). Typically there are some sites which cannot be relocated for monitoring due to changed environmental conditions, vegetative encroachment, or incomplete information on early site forms. Many of the sites monitored, were characterized as overgrown with dense vegetation. Effects of weathering and erosion are commonly noted.

Maintenance and management of historic structures continues to be a challenge; those that are actively used by the Forest are typically being maintained according to historic preservation standard. However those that are not actively used are not consistently well maintained and may be subject to vandalism and deterioration. Several examples exist across the Forest of historic preservation through appropriate maintenance and rehabilitation efforts at many important historic sites, including Pearl Creek Guard Station and Fish Lake Remount Station. Several historic lookouts are regularly maintained, stabilized or repaired in partnership with a lookout volunteer group. A fairly unusual stone oven attributed to Basque railroad construction workers was reconstructed by a dedicated volunteer in FY2012.

Continuing programs of public outreach and education strive to improve understanding and appreciation for these resources. Preservation signing is encouraged at historic buildings and other vulnerable site areas where public use is concentrated, such as campgrounds, trailheads, and OHV-use areas. We are working in conjunction with broader forest efforts to curtail access to sensitive resource areas, e.g. Respect the River.

Consultation with the State Historic Preservation Office (SHPO) continues under a Programmatic Agreement for compliance with the National Historic Preservation Act. Over the two-year period, 133 projects were reviewed to determine their potential effects to historic properties (cultural resources). For the most part this results in findings of "Historic Properties Avoided" or "No Historic Properties Affected." In 9 cases, mitigation measures were applied

to ensure a determination of "No Adverse Effect" to historic properties. Consultation with local federally-recognized tribes continues to improve. Review of a sample of environmental assessment documents indicates consistent consultation with SHPO and improved documentation of consultation with Tribes.

The heritage program staff provided numerous interpretive opportunities, classroom visits and Outdoor school presentations. The Sweet Home RD continues to host the annual Conservation Civilian Corps Alumni picnic each summer, as well as numerous Heritage hikes and an annual Heritage Expedition, all of which are very popular with the visiting public.

Here are some other significant accomplishments & highlights that we report elsewhere that you may want to include in the report:

- Met our "target" of Heritage Program Managed to Standard as measured by seven "indicators";
- Three sites were evaluated for their eligibility to the National Register of Historic Places, and one (Fish Lake Historic Site) was nominated to the Register. (Listed July 2014);
- Participated in Outdoor Schools offering children some exposure to archaeology and Native American life on the Forest;
- Hosted numerous Heritage Hikes for school groups, and others such as International Archaeological Film Festival participants.

Specially Designated Unique Areas

Monitoring Questions 3: Wilderness

Is wilderness being managed to provide for a wide range of permitted uses while maintaining wilderness character and natural processes?

The Forest monitors the class settings and use levels of its wildernesses. The Wilderness Resource Spectrum class settings are consistent with the S&Gs for Wilderness management.

Use limits in Wilderness are exceeded during peak periods. Public education and information process continuing.

The forest will issue priority use permits to existing guides freeing up capacity for new permitees.

The Wilderness Working Group (WWG) is made up of wilderness managers from both the Willamette and Deschutes. Since 2005, the WWG has improved wilderness stewardship by creating and implementing a wilderness education plan, designing and pilot testing a recreation site monitoring program, completing the first phase of fire use planning, invasive plant monitoring, and improved communication and coordination between the two Forests. In 2012 and 2013, the

WWG continued to coordinate work in support of meeting the Chief's 10 Year Wilderness Stewardship Challenge, including wilderness recreation site inventory, invasive weed monitoring, monitoring of permitted commercial outfitters and guides and solitude monitoring. In 2010, the forests partnered with West Virginia University to complete a visitor use survey for the Mount Jefferson, Mt. Washington and Three Sisters Wilderness areas to collect the data necessary for a completing a needs assessment of commercial and institutional use of these wilderness areas. The forests received the results of the survey late in 2011 and completed a capacity analysis and needs assessment in 2012-13. By the end of FY14, the forests will issue priority use permits to existing permitted outfitters and guides. This will free up capacity and allow new permittees to apply for outfitting and guiding in the wilderness, if they meet the determined "need" that resulted from the Needs Assessment analysis.

A permit system monitors visitor use in all wilderness areas on the Willamette National Forest. Based on data submitted, visitor encounters are estimated to be within the established Forest Plan Standards with some exceptions. Standards for the number of visitor encounters are also estimated to be exceeded during weekends and the peak season at: Marion Lake, Jefferson Park, the Eight Lakes Basin, Duffy Lake, Erma Bell Lakes, Benson Lakes, and Tenas Lakes. In the two Limited Entry Areas, forest patrols, designating sites, and other actions at Pamelia Lake and Obsidian Cliffs have improved social and resource conditions. Even with a day use and overnight quota permit system in place, use numbers for both Limited Entry Areas fluctuates seasonally due based on weather and in the case of Obsidian, when Hwy 242 is open for vehicle travel. Obsidian's visitation in 2013 was 3,840 people and a total of 5,429 use days. At Pamelia LEA, 2013 saw 3,310 people and 7,174 use days.

In 2012, the Forest began offering Obsidian LEA permits through the National Recreation Reservation Service (www.recreation.gov) and Pamelia LEA was added to the system in 2013.

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Recent burns in the Mt. Jefferson Wilderness continue to displace users into unburned portions of the Wilderness, potentially causing increased encounters and impacts to campsites.

In 2011, the Shadow Lake fire burned in the north and northeast part of the Mt. Washington wilderness, including areas managed by the Deschutes National Forest. The fire and fire suppression efforts severely impacted the Patjens Lake trail; the Forest has received BAER (Burned Area Emergency Response) and rehabilitated these areas and rebuilt trails in 2012.

In both 2012 and 2013, there were numerous other small fires in wilderness areas. Where possible, the forest has begun to use "Confine and Contain" strategies with wildfires in the Wilderness, yet suppression efforts continue to negatively affect wilderness character through the use of motorized and mechanized tools, including retardant drops, creating fire lines, escape routes, helicopter landing zones and evacuation sites. Additionally, almost all lightning starts continue to be immediately suppressed.

In the Mt. Jefferson Wilderness, trail crews continue to remove culverts and install step-down drains, continuing the on-going effort to remove non-conforming and failing structures and bring trails into compliance with the Forest Plan.

Wilderness ranger presence decreased in 2012 and 2013 due to budget limitations. The perception is that conditions may be beginning to slip in some of the special regulation areas, such as campfire bans, camping setbacks, etc.

The Forest made significant progress in the Chief's 10-Year Wilderness Stewardship Challenge in 2012 and 2013, bringing all eight wildernesses to the minimum stewardship level, and expects to maintain these stewardship levels through the completion of the challenge.

Monitoring Questions 4: Wild and Scenic Rivers

Are the outstandingly remarkable river values of all eligible, study, and designated Wild and Scenic Rivers being maintained or enhanced as required?

All designated study and potential Wild and Scenic Rivers are being protected consistent with the Wild and Scenic Rivers Act. Formal and informal monitoring of conditions on the North Fork of the Middle Fork and the McKenzie Wild and Scenic Rivers is being conducted in accordance with their WSR management plans, and the outstanding remarkable river values (ORV's) standards are being met. The McKenzie River Ranger District continued to implement a voluntary private boater registration program and in 2012 and 2013 gathered additional data about river use through an on-site interview questionnaire.

Federal and state agencies are looking at the North Fork of the Middle Fork Willamette River as potential location for salmon recovery efforts, including off-loading adult salmon. District staff are involved in the projects and working closely with the partner agencies to ensure the protection of ORVs.

In 2011, the forest partnered with the University of Idaho and Oregon State University to develop a survey for the McKenzie River Study, with field work occurring in 2012 and 2013.

The study will help the Forest determine appropriate commercial and non-commercial use levels of the upper McKenzie River and the McKenzie River National Recreation Trail. Currently, some commercial uses are restricted on the trail, and commercial outfitter and guide river use is authorized under transitional use permits until the river study is completed.

Work continues with the Oregon State Marine Board on the aquatic invasive species prevention program. Elkhorn Creek, which was designated as Wild and Scenic River under the Opal Creek legislation (1998), still requires a management plan. There were no changes to the designation status of eligible and Study Rivers in 2012 and 2013.

Monitoring Questions 5: Roadless Areas

Are Roadless Areas being managed as provided for in the Forest Plan?

Monitoring of roadless areas focuses on whether the acreages and numbers of inventoried roadless areas and other unroaded areas are consistent with Forest Plan direction. No changes to the roadless area boundaries were reported in FY12 or FY13. The last change occurred in 1998 when 275 acres of the Waldo-Moolack inventoried roadless area within the Desperado timber sale planning area was found to be incorrectly classified as roadlesss. Forest Plan Amendment 34 was completed to correct the roadless area boundary.

In FY00 roadless area boundaries as depicted in Appendix C were moved into GIS (a spatial database).

Monitoring Questions 9: Special Interest Areas

Are the natural, cultural, and historic attributes and conditions of designated special areas being managed to assure their protections and proper human use?

Generally, unique areas on the Forest such as SIAs, OGGs and OCRA are being managed to protect their special attributes. Minor site-specific problems continue to occur in localized areas within special interest areas but overall area attributes are being protected.

In 2008, the forest decided to begin rehabilitating existing motorized recreation-vehicle impacts to the Santiam Wagon Road SIA as part of the Santiam Pass Motorized Recreation Project. This included narrowing and realignment to its historically appropriate width; elimination of inappropriately located dispersed campsites and trail crossings within the SIA, re-vegetation of impacted areas; installation of barriers, regulatory signs, and identification posts along the SWR; and increased patrol coverage to gain user compliance. Funding for this project came from the Oregon Parks and Recreation Department, which has provided continued funding in 2011. An interpretive brochure and information panels are under development and will be available to the public in 2012.

The Detroit District finished the Jo-Jo-Bruno Lakes SIA Implementation Guide in 2012. The McKenzie River District is expected to finish the Hidden/Lulu Lakes SIA implementation guide in 2014.

A non-profit group, Friends of Fish Lake, was formed in 2010. Building off the memorandum of understanding that was signed in 2010 by the Friends of Fish Lake and the Forest, the parties developed a master plan for the area, which includes Fish Lake SIA. The plan outlines and prioritizes future management actions. In addition, the FFL of the FS signed a Challenge Cost Share Agreement to document the continued success of FFL in obtaining grants funds that they use for rehabilitation of Fish Lake Facilities. The Friends of Fish Lake also continued to organize a volunteer week in early June and help with building and site maintenance and improvements.

Monitoring Questions 39: Research Natural Areas

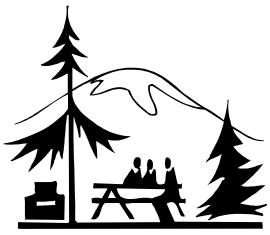
Are Research Natural Areas being protected and inventoried for use as ecological reference points?

In June 2013 Gold Lake Establishment 415 acres Report was signed expanding the size of Gold Lake RNA from 415 acres to 656 acres. The expansion fully incorporated key wetland features and the extensive complex of springs that support the bog ecosystem and include the Oregon spotted frog breeding and overwintering sites.

Further monitoring has been completed on the hydrology and wildlife of Gold Lake RNA.

A more detailed prescription of how fire can be handled in each individual RNA will be developed and made available for decision makers when fire starts in or near a RNA. At this point no fire retardant is recommended in Gold Lake and Rigdon Point RNAs.

Recreation



Monitoring Questions 6: Recreation Opportunity Spectrum

Are physical/environmental, social, and managerial conditions for dispersed ROS settings being maintained?

Standard and Guidelines in the Forest Plan manage activities for the removal of resource products and actions taken to accommodate or control human use to reduce their negative affect on dispersed ROS settings. Monitoring shows these activities are being conducted in accordance with management S&Gs for recreation opportunity settings (ROS).

Specific impacts or efforts related to retaining different recreation opportunity settings were noted at Elk Lake area, Waldo Lake Basin, Opal Creek SRA, Breitenbush River, Scott Lake, and recreation areas adjacent to the South Fork of the McKenzie River, Fall Creek and Upper Middle Fork Willamette River. In 2012 and 2013, the Forest continued to use the Respect the River (RtR) program to address these issues by educating dispersed campers about camping lightly on the land and making improvements to dispersed camping areas to protect riparian areas and protect water quality. Improvements included buck and pole fencing and the strategic placement of boulders to direct and concentrate vehicle and foot traffic away from sensitive riparian areas to already compacted areas that are less sensitive. Some sites were also de-compacted and planted with native plants.

Respect the River, a progam to address and educate recreationists on their impact to the environment.

The Respect the River program also includes a major education element. As part of this, Forest patrols' emphasize public contacts in riparian areas. Site survey forms and public contact forms were standardized, and Forest Protection Officers surveyed dispersed campers to explore how, when and where the public is using sites. Education efforts also included printing Respect the River information in Spanish and Russian, and providing stickers, drink coolers, children's tattoos, trowels and signage with the RtR logo and information.

In 2009, the Detroit District made improvements at Elk Lake Campground to address use levels, party sizes and user activities that were inconsistent with the designated ROS setting. Due to a national moratorium on new fees, the district was not able to charge fees until 2012.

At the Santiam Pass Recreation Area, dispersed campsites have been designated, and a no-camping zone implemented, to reduce impacts to vegetation and soils, and to eliminate use conflicts between developed and dispersed campers around Big Lake. The Detroit Ranger District also closed dispersed sites around Detroit Lake.

Float planes allowed on Waldo Lake but all other gas powered motors still banned.

The Oregon Marine Board adopted an Oregon Administrative Rule (OAR) in 2009 to prohibit gas-powered boat motors and floatplanes on Waldo Lake, except for emergencies and some administrative uses. This motor restriction went into effect in 2010. However, floatplanes were removed from this restriction in early 2012, allowing floatplanes again to be able to land on Waldo Lake during 2012. In May 2013, Oregon Senate Bill 602, which outlaws use of gas-powered motors on Waldo Lake, was signed into law.

With implementation of the OAR and passage of SB602 prohibiting gas powered motors and floatplanes on Waldo Lake, as well as the Forest Order prohibiting use of chainsaws and generators in dispersed sites around Waldo Lake, setting conditions within the Semi-primitive non-motorized area around Waldo lake have improved. The district received very few complaints from visitors about use of motors, suggesting a high level of compliance, although no monitoring records were collected to calculate the degree of compliance.

Snowmobile intrusion continues to be an on-going problem in some semi-primitive non-motorized management areas on the Forest, as well as within the Three Sisters, Mount Jefferson, Waldo Lake and Mount Washington Wildernesses. Specific areas used for access include the Waldo Lake and Taylor Burn Roads, Rd 4220, and the Hwy 242 corridor.

Monitoring Questions 7: Recreation Visitor Use

Are estimated use levels for dispersed ROS settings and developed settings being realized?

Forest Plan recreation visitor use estimates are now largely based on the periodic National Visitor Use Monitoring program results.

Results for the Willamette National Forest survey, completed in 2012, are available online. Total estimated site visits is 1,387,000, down about 250,000 from 2007 surveys. However, due to surveying challenges in 2012, the Forest questions the reliability of the 2012 NVUM data. Looking at permitted use, which is based on actual counts, visitor use in 2012 and 2013 was either stable or it increased.

Monitoring Questions 8: Scenic Resources

Is the quality of the visual resource being provided as directed in the Forest Plan?

In general, the effects of individual landscape alterations are consistent in design and implementation with the scenic quality standards for each management area and the quality of the scenic resource is being provided as directed in the Forest Plan. The cumulative effects of all management activities that might physically alter the landscape are consistent with the visual quality objectives in the Forest Plan. The TOV has not been exceeded.

Monitoring Questions 10: Trails

Are trails and trail corridors being maintained and managed for a variety of uses and experiences consistent with public demand?

Project management activities are not consistent with S&Gs for trail management classes due to inadequate funding. Trail maintenance on much of the Forest has been primarily limited to removal of logs, trailside brushing and erosion structure maintenance. Heavy maintenance is not being done at a level to maintain trails consistent with Forest Plan standards on all trails. Trails that do receive maintenance are normally restricted to one visit a year, usually in the summer. Secure Rural Schools funding has allowed the Districts to accomplish some heavy maintenance projects on high use trails to improve them beyond minimum trail maintenance standards.

Volunteers integral in maintaining trails.

The forest has a very active volunteer program that is integral to maintaining trails across the forest. Strong partnerships exist between several districts and user groups across the forest, including the Greater Oakridge Area Trail Stewards (GOATS), Backcountry Horsemen, Pacific Crest Trail Association, Disciples of Dirt, High Cascade Forest Volunteers, and others. The Middle Fork District hosted annual 2-day volunteer trainings in May, primarily organized by partners. In addition to the volunteer trail work, the forest also hosted Youth Conservation Crews and Northwest Youth Corps crews.

A range of trail opportunities is offered from hiker only nature trails, to motorized only, to multiple users sharing trails. Mountain bikers are restricted from riding on trails in Wilderness. Since 2011, the forest has been laying the groundwork for a forestwide trails assessment by updating trail management objectives; this should be completed in FY14.

The forest continues to tackle a few larger-scale trails projects every year, based on special funding opportunities. In 2012 and 2013, trails capital improvement funding paid for a new bridge at House Rock Campground across the S. Santiam River, major rework of the S. Breitenbush Gorge National Recreation Trail, and Opal Creek/Little N. Fork Trails. In addition, the forest continues to receive Title II/Secure Rural Schools funding for trail crews or YCC on each district.

A Community Trails Plan was completed in 2009 by a trail committee comprised of representatives from the Westfir-Oakridge area. Greater Oakridge Area Trails Stewards, the local trails committee, achieved non-profit status and in partnership with IMBA was successful in 2009 in securing a $400,000 grant from Congress for trails facilities improvements in the Westfir-Oakridge area; implementation of this grant continued in 2012 and 2013.

Monitoring Questions 11: Developed Recreation

Are developed recreation sites providing the variety of use opportunity designed to meet user's needs, interests, and equipment; and being maintained to a level expected and accepted by those using developed facilities?

Monitoring of developed recreation sites focuses on the standards, use and range of opportunities provided. Concessionaires operating under special use permits manage larger campgrounds and developed recreation sites on the Forest. In 2011, two new concessionaires operated most developed campgrounds on the forest. American Land and Leisure operates campgrounds on the Detroit, McKenzie River and Middle Fork Ranger Districts, and Linn County Parks and Recreation Department operates the Sweet Home Ranger District campgrounds. Both concessionaires continue to operate the campgrounds to Forest Service standards. American Land and Leisure raised fees at some campgrounds in 2012, with little to no complaint from the public. Revenues and use continue to grow.

Campgrounds are improved with funds paid at by visitors.

Some campgrounds, day use sites, and boat ramps are managed by the Forest under the Recreation Enhancement Act (REA) Program, which allows the Forest to retain site revenues to supplement allocated funding and manage the sites to higher standards expected and acceptable to visitors. Some of the more notable improvements to recreation sites funded by fees include repairing stairs and railings at Three Pools Day Use Area, replaced five windows, an interior wall and wood floor damaged by water and insects at Timber Butte Cabin, and installed a new interior wood ceiling, improved shelves and sink counter, repaired window shutters, and reduced rodent access at Box Canyon Guard Station..

The use of sites is generally in a manner consistent with the site design and purpose. There are occasional problems with group size and or equipment exceeding the designed capacity of sites. These problems are long-term and are being partially addressed as the Forest implements the Recreation Site Facility Master Plan (RSFA), which included significant Recreation Site Improvement (RSI) projects.

CIP funding arrived in 2010 for planning and design of a new water system for the North Waldo/Islet campground complex. A test well was drilled in 2011, finding a reliable water source. Construction is expected in 2014.

The forest received grant funds from the Federal Highway Administration for improvements at Hardesty Trailhead, McCredie Hot Springs, Marion Forks area, Cascadia area, and the Frissell Boat Launch, which will occur over the next several years. The improvements at Hardesty Trailhead and McCredie Hot Springs were largely completed in 2012 and 2013, with only minor touches needed to finish both. Detroit and McKenzie River Districts completed the planning for both Frissell Boat Launch and Marion Forks in 2013, with construction expected in 2014. Sweet Home will start the planning for Cascadia in 2014. The Marion Forks project will improve and protect a heavily impacted riparian area and improve the accessibility and safety of the site. The Cascadia project will help mitigate issues from trash dumping, vandalism, illegal OHV use, and noxious weeds while improving interpretive opportunities for visitors and restoring both a historic CCC-built wall and the Santiam Wagon Road. The Frissell Boat Launch will be relocated across the McKenzie River to improve road safety and improve the accessibility of the site.

Title II/Secure Rural Schools funding continues to support important projects that address deferred maintenance.

Shady Dell Campground continued to be used as a staging area by the Northwest Youth Corp

Generally the range of sites provided throughout the Forest is consistent with customer's preference and use trends; however, on occasion, demand exceeds site capacity (i.e. Detroit Lake, McKenzie River, and Fall Creek). The Recreation Site Facility Master Plan (RSFA) proposed in 2006 that the Forest continue to provide a range of sites and activities, with additional development on the Detroit Ranger District. Shady Dell Campground continued to be used as a staging area by the Northwest

Youth Corp under special use permit on the Middle Fork Ranger District.

Monitoring Questions 12: Off-Road Vehicle Use

Are ORV opportunities providing a quality experience to the customers, ensuring their safety, and the safety of the general public? Are conflicts being minimized between users, with wildlife (and their habitat), and is resource damage being minimized – in areas that are suitable for each appropriate ORV use?

Maps indicate what trails and roads are designated for OHV use.

The Forest completed and signed the Environmental Assessment for the implementation of the 2005 Travel Management Rule in 2009 and published Motor Vehicle Use Maps (MVUM) for distribution starting in summer 2010. MVUMs continued to either be updated annually, or if still accurate, newly dated each year with a date sticker. The maps indicate which roads and trails are designated as open to motor vehicle travel. All other roads, trails, and forest lands are closed to motor vehicle travel.

A decision for the Santiam Pass Recreation Area was made in 2008 which designates, constructs, and reconstructs roads and trails for motorized mixed use and OHV use, including staging areas, visitor information and "learner loops". The project is now complete, leaving ongoing grooming, maintenance and management activities. Patrols dispensed user education materials and information on a 7-day-a-week basis. An on-going issue is OHV encroachment on Hoodoo ski slopes.

At the Huckleberry OHV area on the Middle Fork District, logging in and around the OHV area has affected the condition of trails and limited access during active logging operations. The district continues to rehabilitate impacted trails and roads to restore the high quality riding opportunities. In addition, the district received a grant in 2013 to redevelop the Kid's Loop across from the staging area at Huckleberry. The project includes replanting, making skills-development features and installing signs and fencing. That project is underway and is expected to be finished by September 2015.

Detroit RD has designated the McCoy Creek Motorized Recreation Area for off-highway vehicle recreation. The district continues to focus on developing a staging area that will access system roads currently open to mixed use. Improvements included parking, signing and mapping, installing a vault toilet at the lower staging area, and additional road brushing. One of the primary project drivers is the opportunity to draw recreational use to this financially distressed, but extremely scenic area via an existing road system that is currently open to motorized mixed use. These improvements are continuing and planning is underway to expand parking facilities within the area.

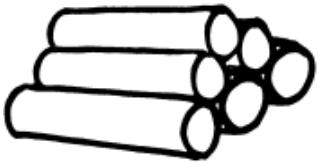
On the Forest, pockets of use show signs of resource damage, particularly around existing dispersed recreation sites and near adjacent private lands. Isolated incidences of mudding occur throughout the forest. As part of the Respect the River Program, mudding education including signing and brochures has been developed.

Timber

Monitoring Question 22: Timber Suitability

Has the suitable land base changed?

Suitable land is land managed for timber production on a regulated basis. Though more than 1.6 million acres are suitable for growing timber, such things as roads, water, poor conditions preventing adequate reforestation, and congressional reserved lands such as wilderness, prevent lands from being suitable for timber production on a regulated basis. Changes to the suitability of lands for timber production have not occurred since FY98.



Monitoring Question 23: Timber Program

Is the timber sale program quantity/quality comparable to the planned levels?

Target accomplishment is measured in terms of volume awarded. Most of the target is accomplished through the sale of traditional timber sale contracts or stewardship contracts. A small percentage of the total volume awarded comes from permits and volume added to existing timber sale contracts. This additional volume comes from smaller diameter biomass material that purchasers agree to remove or trees felled and removed in order to facilitate operations such as landings, skid trails and skyline corridors. The PSQ (probable sale quantity) on the Willamette National Forest is 111 mmbf (million board feet).

Fiscal Year	**FY12**	**FY13**
Target	77.9 mmbf	74.2 mmbf
Total Volume Awarded (percentage of PSQ)	74.1 mmbf (67%)	85.7 mmbf (77%)
Volume from Timber Sales	72.3 mmbf	82.6 mmbf
Volume from Permits and Additional Volume	1.8 mmbf	3.1 mmbf

The volume awarded from timber sales from both fiscal years is sawlog material offered through advertisement in the newspaper. Approximately 5% of the awarded volume in FY13 and 7% in FY12 came from salvage sales. The Forest received viable bids for all sale volume offered for bid in FY13 with the exception of two stewardship sales which did not receive acceptable bids. Those two stewardship sales were re-offered in FY14. Three sales in FY12 totaling 13 mmbf did not receive bids and were re-offered in FY13.

The majority of the timber harvesting program in the past few years, including FY12 & FY13 has been in the general forest (MA 14) and matrix land allocations. However, since commercial thinning has become the predominant harvest method, timber sales have been used as a tool to achieve other resource objectives in other land allocations such as riparian reserves and late successional reserves. In recent commercial thinning sales, up to 35% of the total acres thinned in a project area have been in parts of the riparian reserve.

Commercial thinning is the predominant silvicultural prescription being utilized. In order to introduce and develop stand structural and species diversity, 5 to 10% of the thinned acreage includes gaps ranging from 0.5 to 3 acres in size.

FW-196 States "Uphill falling shall be used in harvesting old growth and large sawtimber on slopes of 30% or greater, except where not operationally feasible or where in conflict with resource protection." With most of the Willamette NF timber sales using commercial thinning as the primary silvicultural prescription this standard and guideline has not applied.

Recent timber sales on the Willamette NF involve smaller, commercial thinning size trees. All of these sales have utilized FW-197 "Directional falling should be used where necessary to protect other resource values to the extent necessary to ensure a variety of resource protection. Directional falling (felling to lead) is a regular design element included in all contracts.

FW-198 states "all available logging systems should be considered for use. The selection of a logging system shall be based on resource consideration, economics and technological feasibility." The Willamette NF timber program makes use of all economically feasible logging systems to maximize the number of acres treated.

Monitoring Question 24: Silvicultural Practices

Are silvicultural practices outlined in Standard and Guidelines being implemented as planned?

Growth responses from intensive management are consistent with expectations in the Forest Plan. Genetically improved stock is being used as planned and will maintain or exceed the growth of natural seedlings.

The National Forest Management Act of 1976 requires National Forests to successfully regenerate harvested areas within five years. Typically, the type of harvest that triggers this requirement is a regeneration harvest. The Act ensures our forest practices maintain healthy, sustainable and productive forests.

To meet the requirements of the Act, planted sites are monitored through 1st and 3rd year stocking surveys to verify survival. Harvest treatments on the Willamette are typically intermediate harvests such as commercial thinning, which leave 40-60% of the canopy cover, and therefore do not require planting. However, there are treatments in which small gaps are

created within intermediate treatments and planted for species diversity as well as sites impacted by wildfire.

Overall, stocking is established and maintained at the recommended levels and within the required timeframe. In 2012 and 2013, stocking surveys were conducted on 687 and 118 acres respectively and certified as successfully regenerated (see table below).

Year	Acres of stocking surveys	Percentage successfully regenerated
2012	687	96%
2013	118	93%

Planned created openings are much smaller than the maximum limits, and is resulting in under representation of young seral forests across the landscape.

Timber Stand Improvement (TSI) accomplishments of thinning, release, pruning, and fertilization totaled 2,457 acres in 2012 and 1,786 acres in 2013. Accomplishments are about one fifth of the amount predicted in the Forest plan. There is a significant backlog of plantations in need of thinning on the Forest, but there are few new regeneration acres, so the backlog is dwindling.

Monitoring of insect and disease activity on the forest is completed each year through aerial flights. There were no endemic levels discovered after the 2012 or 2013 survey.

Transportation

Monitoring Question 38: Transportation System

Is the transportation system meeting the planned resource objectives?

The transportation system is meeting the planned resource objectives at a minimum level.

In the past two fiscal years, additional reductions in our base road maintenance funding (funding has been dropped to around 50% of just three years ago) has exasperated the issue of deferred maintenance on our road infrastructure. We depend upon other funding (Title II, Legacy roads, and deposits) to perform basic road maintenance across the Forest. The majority of road maintenance is directed to those roads with active timber haul. Other roads on the forest that access major forest user destinations (trail heads, campgrounds, etc.), proposed timber sale planning areas, Native American sites, and hunting and fishing areas, receive the bare minimum to keep the roads open in case of fire. Other roads that do not access destinations receive no maintenance and reflect that lack by being closed by vegetation and slides. This problem of reduced maintenance has been severely tested in recent months

because of wide-spread lightning caused fires on the forest. Access for fire crews has been delayed in many cases so that basic road maintenance issues can be resolved before the fire crews can safely access the fires. Using fire to fund basic road maintenance is not sound policy.

Road reconstruction is directed solely at timber sales and addresses deferred maintenance work on access roads for those sales. One of the issues with this approach is that Forest Service personnel have difficulty accessing the planning areas they need to review prior to sale because the money used to address road repairs is from the timber sale proceeds and is not available until the sale is sold. The base funding that should be used for this purpose (CMRD) is so decimated, as noted above, that very little actually goes to the ground.Due to the fundamental changes to the timber harvest targets and drastically reduced road maintenance funding, the miles of road maintained for passengers cars is far below the threshold, but are in line with current budgetary trends. Roads formerly maintained for passenger cars are now maintained for motorized travel that is suitable for high clearance vehicles.

The forest has been going through a travel management exercise since the last Forest Monitoring Report that is evaluating our roads to determine the minimum road system needed to allow access to public areas and accommodate timber and forest product harvest. When this process is complete, the forest will have a better idea of which roads to keep and maintain and which can be stored or decommissioned. While valuable and a useful planning tool, this process will not generate money for needed work to maintain what we have or decommission or store roads that need that treatment.

The forest will continue to allow roads to close due to lack of maintenance funding until the area has a major rain event which will bring the issue to the forefront because of impacts to our water resources.

The table below gives a snapshot of our current road system on the Forest.

STATUS OF THE FOREST'S TRANSPORTATION SYSTEM

<table>
<tr><th colspan="3">Road Construction and Reconstruction</th><th colspan="2">Miles of Road Removed</th></tr>
<tr><th></th><th>FY12</th><th>FY13</th><th colspan="2"></th></tr>
<tr><td>Miles of Road Constructed</td><td>0</td><td>0</td><td rowspan="2">Miles of Road Decommissioned</td><td rowspan="2">0</td></tr>
<tr><td>Miles of Road Reconstructed</td><td>43</td><td>29</td></tr>
<tr><th colspan="3">Road Suitability (Miles)</th><th colspan="2">Traffic Volumes</th></tr>
<tr><td>Roads Suitable for Passenger Cars</td><td colspan="2">528</td><td colspan="2" rowspan="4">Traffic volumes were not monitored in FY12 or FY13</td></tr>
<tr><td>Roads Suitable for High Clearance Vehicles</td><td colspan="2">4,932</td></tr>
<tr><td>Closed Roads</td><td colspan="2">1,254</td></tr>
<tr><td>Total Miles</td><td colspan="2">6,714</td></tr>
</table>

Though much of the road system is not at the levels predicted in the Forest Plan and the TOV in some cases has been exceeded, the differences can be explained by changes instituted with the Northwest Forest Plan and overall changing policies. Adjustments should be made during the next Forest Planning effort to reflect current road management policy.

Social, Economic, and Budget

This section of the monitoring report describes the social and economic environment, which is affected by management on the Forest.

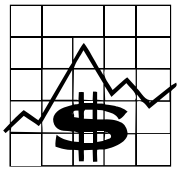
If the reader is interested in more information than what is provided in the following summary they may request the documents listed under Supplemental Information

CONTENTS

ECONOMIC & SOCIAL RESOURCES SUMMARY FINDINGS

Monitoring Question	Monitoring Activities	Monitoring Results	Supplemental Information
41 - Economic & Social	Review of economic reports, agency policies, and public contacts	Results OK	Economic and Social FY12 & FY13 monitoring reports

Economic and Social Assumptions



Monitoring Question 41: Economic and Social Assumptions

Are economic and social assumptions, values, and projections valid?

The Forest monitors a wide variety of sources addressing general local economic and social trends. Key economic facts from the FY12 and FY13 monitoring are presented in summary on the following page.

An additional objective of MQ 41 is to evaluate whether there has been significant changes in public attitudes, beliefs, or values or changes in National or Regional Direction. At times this can be gleaned from news releases, initiatives, plans, and laws passed over the course of 2013 and 2014.

A majority of the news releases centered around fire and fuels management as well as incorporating the community into Forest restoration projects. With the current threats from insects and disease, wildfire, urban development, and impacts of a changing climate, active restoration is a key component of our FY 2013 budget strategy. The Forest Service's FY 2013 President's Budget prioritized Forest Service funding in three themes: restoration, communities, and fire. The priorities were designed to respond to the needs of the American public. The President's Budget aligned with the Secretary's "All Lands" vision to meet the challenges of ecological restoration through collaborative approaches to address forest mortality and live tree density, invasive species and watershed degradation. The budget request will engaged communities and help Americans reconnect to the outdoors, expand on recreation benefits and create a wide range of opportunities for economic expansion to retain and create.

Finally a new planning rule, published April 9, 2012, was designed to replace the 1982 Planning Rule and will keep the collaborative momentum going on what has been a remarkable open and transparent process for the Forest Service's planning rule in 30 years.

The Forest Service, the Willamette included, have historically been focused on water and timber but that focus has now broadened to include forest health, diversity, aesthetics, fire risks. These goals, though at times appear to be opposed, provide the Forest with opportunities to bring our constituents together through education and reflect changing societal values.

FISCAL YEAR 2012 & FY13 FINAL EXPENDITURES

Description	FY12[1]	FY13[1]
Facilities Capital Improvements & Maintenance	$1,003,919	$173,599
Flood Activities	$877,390	$2,140,048
Forest Products	$6,064,140	$6,106,754
General Administration	$3,504,201	$3,451,934
Inventory and Monitoring Activities	$267,978	$178,875
Knutson/Vandenburg Funds	$1,767,611	$1,748,561
Land Management Planning Activities	$50,394	$48,678
Land Ownership Management	$941,266	$857,554
Minerals and Geology Mgt	$275,293	$277,765
Payments to Counties	$2,433,147	$905,528
Recreation/Heritage/Wilderness Activities	$1,506,880	$1,473,017
Roads and Trails Improvements & Maintenance Activities	$3,283,296	$3,570,382
State and Private Forestry	$20,419	$0
Vegetation and Watershed Mgt	$935,109	$754,143
Wildland Fire Management / Fuels Treatment	$3,534,953	$3,075,719
Wildlife and Fisheries Habitat Mgt	$811,655	$829,486
TOTAL	**$27,277,651**	**$25,592,041**

[1] Knutson/Vandenburg Funds are funds used for post harvesting improvement activities. Primary beneficiaries of these funds are Recreation, Watershed , Wildlife, and Fisheries Management

Summary of FY 2012 and FY 2013 Forest Receipts and Payment to States.

Forest Receipts FY 2012	Forest Receipts FY 2013	Payments to States FY2012	Payments to States FY2013
$5,876,397	**$8,601,134**	**$14,918,089**	**$14,875,207**

Forest Plan estimated receipts are not longer calculated. It is quite clear the Forest's receipts are only a fraction of the Forest Plan estimate.

County Breakdown	FY2012	FY 2013
Clackamas	$2,484	$2,488
Deschutes		$767
Douglas	$518,430	$506,912
Jefferson	$2,311	$2,068
Lane	$8,373,429	$8,312,894
Linn	$5,015,397	$5,048,522
Marion	$1,006,037	$1,001,556

Implementation Monitoring

MQ 1 could be paraphrased, "Did we do what we said we were going to do?" This is the definition of implementation monitoring and the focus of many of the monitoring activities that occur on the Forest. Various levels of interdisciplinary monitoring reviews were carried out in 2011 to focus specifically on compliance with the Forest Plan.

CONTENTS

IMPLEMENTATION MONITORING SUMMARY FINDINGS

Monitoring Question	Monitoring Activities	Monitoring Results	Supplemental Information
Standards and Guidelines			
1 - Implementation Monitoring	Environmental documentation and field reviews.	Results OK	Monitoring trip documentation

Standards & Guidelines

Monitoring Question 1: Standards & Guidelines

Are Forest Plan standards & guidelines being incorporated into project level planning and decisions?

A Forest Supervisor monitoring team visited all of the districts and monitored several projects in 2012 and 2013. The results and findings of each monitoring trip were documented and used to generate communication between districts and forest personnel as well as contribute to the overall evaluation of the Forest Plan. Very often these trips also result in recommendations to the Supervisor's Office (SO) for changes or clarifications to the Forest Plan standards and guidelines. The projects to be monitored may be from any resource program area. Criteria for projects are those under the current Forest Plan as amended by the NWFP standards and guidelines and those with a substantial amount of on-the-ground work accomplished.

Forest Plan Standards and Guidelines, Northwest Forest Plan direction, and overall consistency of projects to the general goals and objectives of the Forest Plan were reviewed. The documentation (NEPA analysis, decision documents, prescriptions) and the on the

ground results were checked for compliance with the Forest Plan. The monitoring team consisted of the Forest Supervisor or, Deputy Forest Supervisor, SO Staff Officers, the Forest Interdisciplinary Team Leader, SO technical staff, District Rangers, and District staff.

PROJECTS MONITORED IN 2012 and 2013

Ranger District	Activity Monitored 2012	Activity Monitored 2013
Detroit	EA for the Meadow TS is Presley's Twin	Marion Forks Hazardous Fuels & Commercial Thinning
Sweet Home	Camas Prairie Restoration and Moose Creek Steelhead Habitat Improvement Projects	Canyon Creek Large Wood Restoration Project
McKenzie River	Andy 6 Timber Sale	Two Bee EA, Pryor (Units 34, and 7) and Buzz T.S. (Unit 6)
Middle Fork	Jim's Creek Savanna Restoration Project	Calapooya Divide Meadow Restoration Decision Memos

Forest Supervisor Reviews

Detroit Ranger District 2012

The monitoring team stated their primary objectives in monitoring this project included interest in consistency of project design and implementation and learning from future project implementation. Also of interest was open and honest communication; want to share and learn and improve process for work in future and meet goals of Forest.

Unit 14 and 15: This entry for the Meadow TS was the finale overstory removal and harvested about three trees per acre (TPA) with cut tree marking. This existing shelterwood unit was created in the early 1990's and retained about seven TPA. The area is a flat bench sloping down from the crest. At 3700 foot elevation the area is known as a frost pocket and retained overstory trees protected the natural understory tree development. The plant associations are mountain hemlock and Pacific silver fir. The fire history included two burns, one in the mid 1800's and a re-burn around 1900 resulting in the subsequent stand generation. In the 1970's the original stand harvest treatment was done where the true firs or white woods were removed; then as mentioned, in the 1990s most of the Douglas-firs removed.

The presently retained trees were for wildlife snag creation and dead and down requirements. While placement of these trees not optimally dispersed, standards and guidelines were met for retention. Also for regeneration or shelterwood creation under the Northwest Forest Plan, 15% of Green Trees are to be retained (also called GTRs). Since this standard was signed in 1994 and after initial harvest, GTRs were placed next to existing shelterwood and documented in the Geographic Information System (GIS) layer.

Changes occurred from the EA planning design to implementation. The Presley's Twin EA was signed in 2007 and since that time problems with resource integration have been resolved. The visual prescription retained 10 TPA along the main road for visual management objectives; however, this was not implementable since essentially all trees would have to remain. That portion of the unit was dropped. Now integrated prescriptions for harvest treatments and protection measures have to be reviewed by all specialists.

To be economical in harvesting these flat areas ground based harvest systems are used which can cause compaction. Forest Plan standards and guidelines require compaction to be below 20%, FW-081, within the total acreage of the activity area including roads and landings. Before this entry it was estimated the compaction was 18% from preceding logging and road building activity. After this final entry Dough Shank, Forest Soils and Geology Specialist, took plots after subsoiling of compacted areas was completed and calculated an average of about 10%; meeting S&G requirements.

A relatively new method of subsoiling is called munching. It is done with a bucket on excavator and it vertically grabs soil and debris down to 18 to 24 inches, lifts and drops to break up compaction. This reduces root pruning which used to be a problem with the old method. There is trade off with subsoiling which can open up the area to invasive weeds. The equipment used was a rubber tire skidder and a track excavator. The skidder provided more flexibility in moving rocks and logs.

Planting was planned for every unit but was not needed. At issue was the change in post-sale restoration work. Planting was initially essential Knutson-Vandenberg Act improvement work. However, and which is important to note, in Appendix F – Monitoring Report it stated that surveys would be conducted to determine any reforestation needs. On the updated KV report planting is listed as number 27 and stocking appears to be within standards.

Stop 2: Unit 19: Compaction was an issue for this unit and with post-harvest subsoiling was brought to about 11% for the activity area and within standards and guidelines. EA direction was to use existing skid trails where appropriate and contract said they have to be approved by Timber Sale Officer. Existing skid trails don't always fit current logging system. However, before subsoiling was completed did have runoff, creating a water channel down skid road. Sometimes hard to tell where may have runoff; skid road was not steep nor appear to have much slope in general. It was a short lived problem. Cara gave a review of the history of the area. There has been long use of the area by native peoples, as evidenced by lithic scatter and traditional use history. John Breitenbush (bat eye) was the first of European heritage to reside in the area around 1840's. Around 1918 the original resort was developed on Forest Service ownership. At sometime after the resort failed and buildings were removed, some went upstream to the hot springs community on private land ownership. Now just concrete foundations remain of the pool area. Sanitation of the pools is sketchy; however, the polls are not stagnant but have free flow of water.

Stop 3: Unit 54: Unit 54 was a commercial thinning of a 150 year old stand in Forest Plan general forest/matrix allocation, where most timber harvest and silvicultural activities would be conducted. Thinning was prescribed to improve forest health and vigor of remaining trees and to reduce the potential of wildfire severity by breaking up the vertical fuel component and reducing the amount of ladder fuels.

The leave tree making was by designate by description to 14 feet which equates to about 100 TPA or the retention of about 120 square feet of basal area.

The grapple piling of fuels of slash was completed for the entire unit by the timber sale contractor.

Detroit Ranger District 2013

Background: The project area is a total of 690 acres in size and includes Highway 22, the Marion Forks State Fish Hatchery, the Marion Forks Campground, and the Marion Forks Recreation Residence Tract (18 residences). The project area is also adjacent to the small community of Marion Forks. The purpose of the Marion Forks Hazardous Fuels and Commercial Thinning project is 1) to protect private land and structures from fires that start on National Forest lands as well as to protect National Forest lands from fires that start on private land; 2) create stand conditions that are more resistant to crown fires by reducing canopy cover, ladder fuels, and ground fuels; 3) reduce tree competition in order to increase stand health and vigor, which would improve fire resiliency in the long term; 4) contribute timber products in an economically viable manner to meet Willamette National Forest long-term sustainable harvest levels. Alternative 2a is the same as alternative 2 except for canopy cover in the commercial thinning have been adjusted from 50% canopy cover to 60% canopy cover. Alternative 2a includes the following: Approximately 577 acres of hazardous fuels activities; Commercially thin 156 acres of 100 to 140-year-old stands; and other treatments such as: pre-commercial thinning/pruning, 1 mile of temporary road, and road maintenance.

Office: Introductions by Grady McMahan. Suzanne Schindler gave the objectives of the review which was to evaluate the consistency of project design and implementation; and learning for future projects. Forest Supervisor Expectations by Meg Mitchell: Implement how we are a learning organization by reviewing environmental compliance and learning for future projects; also look at how project used landscape application and role of fire. Lyn gave overview of EA project, and history. Danni gave safety briefing; two field stops will be reviewed and added one.

Stop 1 – Horn Cr, hazardous fuel reduction discussion

The review team met with Miles and Sue McMillian, head of the Marion Forks Investment group, who gave their background and interest. They are third generation land owners and part of a family partnership who manages 5,000 acres, 4700 is forested. The initial logging occurred in the 1950's and 1960's and their land is surrounded by National Forest land. They had to evacuate their homes two times because of wildfire threat. As a result the present management focus is thinning for timber and fuels reduction. Also some regeneration harvest is done where sites are under performing needing a restart, generally in 20 to 25 acres at a time.

The Marion Forks Investment group fuels reduction work set an example for Forest Service work. On National Forest land the fuels reduction prescription retained 50% to 60% canopy closure. We thinned out live and dead trees less than 7 inches to 20 foot spacing. Limbed up bigger trees and left Pacific yew and white pine if there for diversity. To reduce visual impacts to recreationist we had tree stumps cut low to ground. Fuel loadings were reduced by piling sticks less than four inched to burn and the larger wood was cut and scattered. The objective was to reduce ladder fuels and increase diversity. The intent is to decrease surface to crown fires.

There is a need to continue these treatments every 10 years to keep down the fuel loading. Young conifers are like candle sticks and increase wildfire potential. Adjacent work also needs to be done; next Forest Service planning area is called Red Moon. The objective is fuels reduction with some resulting timber products and infrastructure maintenance; while providing jobs.

The B&B fire off Highway 20 pass towards Sisters is a warning to the local community to fire proof their forest.

Stop 2 - Road 2255 to look at the commercial thinning in units 1, 2 and 5. The recreation residences are located in unit 5. There is also completed hazardous fuels (HF) work here.

General introductions were made between Forest Service personnel and recreation residents and the purposed of the monitoring review. Residents own their home but have a special use permit for the use of National Forest land.

Penny Keen talked about the communication between the residents, Freres Lumber Company, and project implementation. Thinning out the trees around the homes occurred in the winter time with about two feet of snow to lessen potential impacts and be light on the land. Some minor damage occurred, a tractor ran over someone's porch and an outhouse was damaged. Repairs were made and resulting improvements, such as: installation of indoor plumbing and left some wood for firewood.

The logging was tricky next to houses but the residents overall like the hazardous fuels reduction and the increased light to their homes. One resident did not have thinning next to their home. Thinning was also done across the road in the adjacent forest to further fire poof the area.

The objective was to create a balance between thinned and un-thinned areas for fire protection, visual esthetics and retention of habitat for wildlife species.

Stop 3 – A quick stop to joining of private land and public land thinning

Marion Forks Investment group thinned in 2008/2009 to about 50 trees per acre next to National Forest land where it was thinned to a designate by description of 17 foot or about 60 TPA. Looked good and provided a solid fuel break for the area.

Wrap up – SO and District staff all share brief observations from the review.

Some team comments:

- Liked working with private group and public. Interaction help create a better outcome.
- Liked to see fuels reduction with timber support and products.
- Thanks to all for making the project successful.
- There was a lot of personnel turnover in implementation but was able to keep on track. Integration across different specialist helped project completion. Also had help from YCC group to stack sticks for fuels reduction and getting our youth involved was good. Payco provided funding for fuels reduction work.
- Where there are skid roads these will be ripped and seeded for big game.
- This is a good showcase project and can be used as an example for other Districts.

- We met intent of environmental analysis and contract. However, the nuance in implementation was complex. The contract was black and white but the implementation was grey.

Forest Supervisor comments: Love, love the project. I appreciate the time spent and attention to detail, integration with each other and public. I think we touched the heart not just the mind – we care. We decided with our neighbors what needed to be done and then how to implement it. The project took some time but worth the outcome.

Sweet Home Ranger District 2012

The monitoring team set forth the objectives of consistency in project design and implementation and learning for future projects. Other objective is open and honest communication and integration of resource participation.

Commercial thin, keep Crescent Lake trail head open off road 508 The purpose of the project was to improve stand health and enhance tree growth; encourage species diversity and complexity, and reduce the population of off-site ponderosa pine; accelerant stand complexity; and provide wood products to the local market.

The silvicultural treatment was to thin to 70 trees per acres (TPA) and 40% canopy retention. To reduce the risk of spread of the annosus root rot, it was necessary to remove grand fir which is highly susceptible to the disease. Forest service personnel did the leave tree marking of trees instead of contractor implementation of designate by description marking because of the complex prescription of having to remove specific species. Leslie and Frank reviewed residual stand and retention objectives were met.

The Crescent Lake trail head is accessed off road 508 which is the same road used to access the thinning operations. The EA required the road to be open for weekend access by hikers. Frank Moore was the timber sale officer and the road was made usable for weekends as well as during the work week, with some minor delay if logging equipment had to be moved.

Grapple piling of created harvest slash was prescribed; however, tops were yarded instead. There is a provision in the contract to allow this but the fuels specialist was not contacted to okay. The fuels standards and guidelines for fuels reduction are met; however, it appears that residual large wood has been moved. Also may want to retain some slash to recycle nutrients into soil and reduce potential of false brome weed invasion. Fuels specialist would like to be notified. Taking tops is market driven; operator may not want to do. If in the future do not want whole tree logging, need to say in EA so C211 contract provision does not get in contract.

Essential KV was collected for planting to replace areas or gaps where off-site ponderosa pine was removed.

Existing road had some trees growing in it, they were removed and the road was opened by the contractor and used for logging operations. After use was completed the road was closed by contractor. They installed drain out features and piled slash on the road to prevent erosion.

Extra trees were retained for snag and down creation. Usually wait a few years after operations to count snags inadvertently created by logging, burning or blowdown. Also root rot can enter trees through mechanical damage. For the true firs can get sunscald as a result of thinning and new exposure to sun. Usually see impacts from sunscald in about 3 years but mainly occurs on south facing slopes. The District will new create snags if needed.

Stop 2: Unit 14: The group briefly stopped to look a very large slash pile. This was another example of using the C211 contract provision of yarding tops and creating an unwanted slash pile. This was approved by TSO and fuels specialist, however; the unexpectedly large size has created problems. The fuels specialist did not appraise to burn these large piles, some will have to be taken apart because there is a lot of dirt and may kill adjacent live trees when burned. This may result in reduced dollars going to KV projects. Need to review with IDT before have change of prescription.

Stop 2: Unit 15: This unit is 14 acres and was originally clear cut in 1957. The silvicultural treatment was thin to 80 trees per acres (TPA) and 40% canopy retention. All the off-site

ponderosa pine, greater than 7 inches, were cut and removed. These unwanted ponderosa pines were in clumps and will have these quarter acre gaps planted to about 200 TPA of western white pine.

The original decision notice was pulled to create Alternative 4 which was to increase the timber volume offered. Generally the new alternative increased the intensity of thinning prescriptions. This stand is thinned to 40% canopy cover and is assumed this will be the only thinning entry. Designate by description was used for the marking plan and is usually the most cost efficient. This alternative increased volume from 8 million board feet to about 11 million. Heavier thinning does accelerate the growth of residual trees. The Young Stand Study out of HJ Andrews Experimental Forest does prove in heavy thinning that you have greater release of remaining trees. In the HJA study, release of the residual stand occurs at 50 TPA retention. Little or no release of tree growth occurs with 100-110 TPA residual in light thins without gaps and the control. However, residual trees on gap edges do display release.

The district botanist talked about *Bridgeoporus nobilissimus*. This species was located in Unit 6, where a 300-foot no-harvest protection buffer was placed around the rare fungus to maintain microsite conditions. Researchers are now doing DNA analysis on the rare fungus and have determined that there are some of this fungus found in other species beside noble fir, such as Douglas-fir and western hemlock. So far the conk, reproductive part of the fungus, is mainly found in noble fir stumps. Researchers and the region are in the process of developing a conservation strategy for the rare fungus. They want to know why they favor noble fir.

Sweet Home Ranger District 2013

Background: The Canyon Creek stream reach needed to have structure and wood restored to improve hydrologic function and steelhead habitat. The District restored the area by excavating in strategically located "trash racks" and helicopter placement of large wood with root wads. The source area for large wood was from a 100 year old stand thinned 1998, the EA was Flam Santiam and the resulting timber sale was called Flam Thin. A new silvicultural prescription was done with the DM which created eight half acres gaps in the thinned stand. This was to provide logs for Canyon Creek and to increase species and structural diversity in the thinned stand. Last minute design changes were required following changes in private timber land participation as a result of the moonlight fire lawsuit; the private land owned by the Roseboro Company did not receive stream log placement as planned in the DM. Wyden amendment was used to do the stream enhancement from public lands to private lands.

Office: Introductions by Cindy Glick. Suzanne Schindler gave the objectives of the review which was to evaluate the consistency of project design and implementation; and learning for future projects. Forest Supervisor Expectations by Meg Mitchell: review environmental compliance and riparian treatment application and learning for future projects. Lance gave overview of EA project, history and safety briefing; two field stops will be reviewed.

Eric Hartstein provided background about the watershed council's involvement in implementing the large wood placement in Canyon Creek. Funding was from an OWEB grant for the excavating of trees and helicopter placement of wood. Also some funding came from Title II funds and the Forest Service provided the wood and expertise. They used Cascade Timber Company's (CTC) recommended contractor Haley Construction to do the work. The bid and results were favorable and CTC was comfortable with implementation on their land. Contracting through the watershed council was local and more flexible. Wood for Canyon Creek was also gathered from hazard trees in campground and the reservoir.

Stop 1 - Large wood source area, Gaps in Flam Thin off Gordon Road

The four acres of gaps provided about 160 logs with root wads attached for fish logs in Canyon Creek. Design features or mitigation used were:

- Narrow spur roads for access into ½ acre gaps to limit weed encroachment,
- seeded Blue Wild Rye to out compete weeds, and
- planted in cedars to provide diversity of tree species.

Talked about 115 year old thinned stand and development of thick western hemlock understory; need to plan for thinning of this understory to increase attainment multi-story canopy. We could track this need of pre-commercial thinning in the FACTS database.

We then walked up the road to view a thinned unit and un-thinned portion of a riparian reserve. The un-thinned area next to the intermittent creek had no shrub cover, some small snags and a single story canopy. While the thinned portion of the unit had shrubs and the beginning of a second canopy.

Stop 2 - Canyon Creek large wood placement area

As entered into Canyon Creek riparian area, noticed large rock placement and dips to stop ATV access and promote restoration of floodplain. Large logs were placed (also called island jams/trash racks and bar buddies) in areas of creek to promote pool enhancement. Pools form behind compiled logs; baby fish like these cool pools for habitat.

Had YCC kids add complexity to these log jams by adding sticks, to help trap leaves and fine sediment for fish.

Wood placement on of edge stream channel and into side channels to enhance floodplain next to creek. In the floodplain there were small islands with vegetation starting to grow and more gravel for fish.

We also went where there are logs decked along the creek for phase II of project next year. This would be more log placement as well as repositioning existing logs which have shifted.

Wrap up – SO and District staff all share brief observations from the review.

Some team comments:

- Learned a lot about NEPA and island/jam development. Open discussion of what worked and what didn't. Such as one tree too heavy to move with helicopter and what did with it.

- Thanks to District personnel, YCC group and Eric from watershed council for all hard work!

- Liked to see thought process behind project implementation. Can't wait to see completion of next phase.

- Learned about RAT team (Regional Assistance Team) who helped with riparian restoration project design. Generally group of regional experts in this type of work.

- Like integrated riparian management, discussion of silviculture and gap creation and thinning discussion around riparian areas.

Forest Supervisor:

- Innovative work with partnerships! Need to keep up good work and expand dialog. Share what we do and professionalism. Thanks to District and watershed council for hard work.

- Soup to nuts, explained entire process. Also like discussions and looking at what gives the Forest Service the most options for the future. Good to look at silviculture and what are we doing with understory of thinned stands.

- Perfect way of telling story from beginning to end of project. Where got wood for project and then how used wood in restoration

McKenzie River Ranger District 2012

Objectives for this trip were consistency of project design and implementation, and learning for future project implementation.

Cougar Thin (TS): Traveled to 70 acre unit of approximately 42 year old second-growth. The team reviewed riparian buffers or Skips, Gaps (up to 3 ac.), and thinning.

The unit was thinned in 2011. The thinning prescription in the DM was to a variable spacing of 12 to 22 feet. This was done by Designate by Description (DxD) of 16 feet or average retention of about 70 trees per acre. Twelve plots were taken and an average of 61 TPA was retained and was 21% of Stand density Index. However, retention did achieve desired 40% canopy closure for northern spotted owl dispersal. The Silvicultural Prescription was signed by all District resource staff and appeared to be an integrated prescription.

Some mitigation in contract was not in DM, such as no timber harvesting during Elk hunting season restriction. Need to display mitigation in DM – especially if has an economic impact. Seasonal restrictions have constraints on the purchaser and with small sales they have to be economically feasible. Good to see implementation was done well and thought given to on the ground effects.

In the DM for erosion control it was prescribed to scarify landings and skid trails to 18 to 22 inches deep. However, in the contract it says to scarify to 4 to 6 inches deep. There was some discussion of the necessity to scarify. The scarification of skid roads can create fertile ground for weeds to invade. Also originally scarification was designed to mitigate the effects of clearcutting and since this is thinning there is a debate about prescribing this treatment. However, Forest Plan Standards and Guidelines has a threshold of not to exceeded 20% compaction. The unit was approaching 17% compaction and the scarification prescription was justified.

Firewood logs are now stacked on landings. Need to keep skid trails open to access low elevation firewood. Collected KV to scarify after firewood has been removed by public. Started new fire wood policy on District – first come, first served. Old process was a lottery and public not happy. So far the new fire wood policy is working well, there are fewer complaints.

Whole tree logging was done to reduce fuel loading in unit and to provide fire wood from un-merchantable tree tops. However, a lot of branches break off when dragged to landing and leave fine fuel in the unit. Don't always prescribe whole tree yarding but because of high traffic use area thought it necessary. This unit is close to the power line, dam and peregrine falcon nesting. Added hand pileing of slash to reduce fuel loading, which was completed by fire crew.

The group walked to a gap that was about 2.7 acres in size. Some minor trees or western hemlocks were retained within gaps for diversity. The plan is to subsoil gaps for site treatment to plant and grow grass seed and shrubs for big game and wildlife, such as peregrine falcons who like berries. There were seven acres of gaps of varying sizes. Another three acre gap was reviewed that had no minor trees retained since none existed in that area. Designate by description thinning does give feathering appearance next to boundary of gap.

The next stop was to the edge of a Riparian Reserve boundary along a creek. The no-harvest buffer prescribed was 66 feet or to the slope break whichever is longer. While the measurement of one spot from the creek to the end of the no-harvest area was about 45 feet it appeared that the buffer width varied along the steam. Also the buffer retained included upland vegetation and the riparian micro-climate was preserved.

Discussed with the planner the interdisciplinary process and scoping. The planner sent out the scoping notice and incorporated public comments into project design resulting in little or no public controversy over the project. Well thought out up front work provided a smooth transition to implementation. The planner had about three meetings with team which also provided very good internal integration, feedback and implementation coordination for this small project. Prescreening of which unit to thin and stand exam work also helped with successful implementation.

The Forest Botanist and Forest Hydrologist reviewed a wet area or seep and there was good protection of this site and it contained a high diversity of specie. Below this area was an existing spur road that was reused to access part of the unit and was wet. May not be ideal location but since it was created already, rather than make a new spur road it was best used again. It will be scarified after firewood removed from unit. Recommend not channeling crossing point and keep as is so drainage will remain diffuse and not result in erosion.

McKenzie River Ranger District 2013

Background: The Two Bee Decision Notice was signed December 07, 2006. The purpose of the project was to:

- provide approximately 11 MMBF of timber from young and mid seral stands in General Forest / Matrix land allocation,
- enhance stand growth and vigor while providing forest habitat components for big game and other wildlife and aquatic species, and
- implement findings and recommendations in the Upper McKenzie WA for Landform Block 2B to meet ACS objectives.

The proposed action was partial cutting on about 712 acres, salvage on about 26 acres and commercial thinning on approximately 87 acres. A combination of ground based, skyline, and helicopter yarding was proposed in addition to two .5 acre helicopter landings along Forest road 2676-655 and 2678-681. Yard tops attached with an under-burn was prescribed for the fuels treatment.

Office: Introductions by Terry Baker. Suzanne Schindler gave the objectives of the review which was to evaluate the consistency of project design and implementation; and learning for future projects. Forest Supervisor Expectations by Meg Mitchell: open and honest communication; and to use what we learn for future projects. Shane gave safety briefing. James gave overview of EA projects and history.

Stop 1, Unit 34 of Pryor T.S. Mature stand thinning, in view of Smith Reservoir

We had a group discussion of consistency with project design/decision, consistency with Forest Plan standards and guidelines, and objectives.

The morning started out a little foggy as the monitoring review team took a look at the recently thinned 150 year old mature fire regenerated stand. The harvest prescription was thin from below leaving the larger trees; producing a post canopy closure of about 50-65% or 37 trees per acres (TPA) plus 3 TPA for future snags.

Because the remaining trees were mature and large, 18 to plus 40 inch, full canopies provided screening for Scenic Management allocation 11c or view from Smith Reservoir. This area was

also in a high emphasis elk area and a no cut buffer of trees was provided along the 687 road to screen the thinned stand from hunters.

The harvesting system was partial suspension to reduce soil impacts and yarding tops attached for fuels reduction. The value of whole tree logging was discussed as compared to a nearby helicopter logged unit. The helicopter unit had more slash since the tops were left in the woods. With whole tree yarding there was less slash or fuels left in the woods. Also with harvesting larger trees (more merchantability in the top) the purchaser wanted more of the tree; so in the future, harvesting mature trees, you may not want to require that contract stipulation since it would be preferred.

A Landscape Analysis was done in Appendix J and tiered to the 2B Landform Block identified in the Upper McKenzie Watershed Analysis (1995). A balance of treatments disclosed in the Environmental Analysis would be implemented to meet target landscapes and recommendations in the Watershed analysis. This moderate partial cutting would help maintain and increase overall growth and vigor of remaining trees and fire intensity would be less in a wildfire situation. Under-burning was not completed at this time but it will be reevaluated to determine need to meet target landscape.

No riparian or fish issues for this unit. Also a discussion occurred if the focus was owls, what would be different for this moderate partial cutting in a mature stand? This habitat is preferred for owls and if treated for other resource emphasis, then mitigation would be needed now. One remedy suggested would be to clump live trees around snags, designed skip, to reduce any loss to snags due to logging saftey requirements.

Stop 2, Unit 6 of Buzz T.S. Treatment is complete. This stop was a post-harvest and burn view of end result of timber sale operations. We had a casual conversation about project while we eat lunch.

This is another treated natural stand but on a poorer site so remaining trees are not as big. This site was burned twice. The first time the conditions were not optimal for burning and had to come back to meet the prescription requirements. Overall it was a lighter burn with little mortality and was within desired outcome. The limit was 10% mortality.

We talked about what the future harvest prescription might be. Might promote high quality wood with selection harvest and or create 3 to 5 ac gaps to promote understory of natural regeneration to get multiple canopies.

Stop 3, Unit 7 of Pryor T.S. Group discussion. We were parked in a 300 meter owl core which recently caused an adjustment to the unit. The unit has not been harvested yet but expected to be this summer.

Originally this project was consulted on with the US Fish and Wildlife service in 2007. The owl core recommended was 200 meters and now after 2012 re-consultation it is 300 meters. A change was made to the unit boundary to meet consultation requirements, excluding a total of 300 meters to the unit.

We walked through the stand to get an idea of pre-harvest conditions. The harvest prescription is another moderate partial removal from a 150 year old fire regenerated stand. However, to get the same 50 to 65 post canopy closure, more trees are remaining (about 50 TPA) because the site is lower or contains relatively smaller trees.

The group also looked at a shelterwood harvest stand next to Unit 7. If this type of harvest was prescribed would have to look to benefits to other species like big game, birds, insects or fire resiliency. The removal of suitable habitat in critical habitat will have effects.

Wrap up – SO and District staff all share brief observations from the review.

Some team comments:

- It would be good to get ahead for potential high severity fires, like the stands created 150 years ago.
- Need to revisit landscape analysis that was done in the late 1990's. Base line data still good and apply to present conditions. Use in current planning process. Watershed Analysis are in process of posting to external web- should be done end of this summer.
- Good to learn about past and historical issues and implementation. See if still applies.
- No fish were harmed. Liked that the Aquatic Conservation Strategy Objectives write-up was an integrated approach and signed off by affected resources.
- Good to learn more about west side ecosystem, actions tied to research.

- You hear a lot about flying squirrels, never seen one, are they really there? They are nocturnal.
- May not be able to do treatments in older stands with red tree vole survey requirements.
- Like review of even-aged management and group selection.
- Good communication between District folks which resulted in a good project.
- Nice to see finished project; however took 12 years from start to finish; signed in 2006.

Forest Supervisor:

The McKenzie District has a high quality of ID Team; knowledgeable and integrated.

Glad to hear Watershed Analysis is still useful and relevant, and applied with an updated landscape analysis. If public knew how much effort was involved, they may appreciate project more.

Need more conversation around critical habitat and what's next and how do we manage now

Middle Fork Ranger District 2012

Monitoring objectives stated were consistency of project design and implementation. interest in planning for future maintenance of meadows; early seral habitat; and meadow restoration; and integration of resource participation.

Alder Creek Bridge abutment repair: The Engineer talked about the bridge repair needed due to water undercutting the abutment. All the work was done by hand because equipment couldn't access the creek. A cement curb like structure was installed. To do the work the running water was bypassed with a pipe and the fish rescued. Contractors enjoyed rescue work. Very little sedimentation ran into the creek. There was some discussion about timing of work and Terms and Condition from NOA consultation. An extension of time was needed and received by NOA. Original design of dewatering was modified to the pipe to divert water but overall intent was met and turbidity was well below acceptable limits.

Unit 49 light thin (EA unit 449): The second growth unit was just recently thinned in March 2012. Eric and Toby discussed the thinning by designate by description (DxD) and with dominant tree release (DTR) gaps. The combination of different thinning's (light, moderate, heavy), DTR and skips of thinning (such as riparian no cut buffers, special habitats) would result in variable density thinning and the development of stand structural

complexity. The DxD was to approximately 21 foot spacing of residual trees and the DTR cut generally all the smaller trees to 60 foot from the biggest tree. The treatment target for light thinning was to retain about 99 Trees per Acre (TPA) with a 25% variance resulting in a range of 74 to 124 TPA. Eric and Tom took two plots and they got 85 TPA – meeting within the recommended prescription.

LSR direction is to develop late-successional stand structure for the benefit of the northern spotted owls. The assignment of which thinning treatment (light, moderate or heavy) depended on the units proximity to owl locations across the landscape. The Mid-Willamette LSR assessment recommended dead and down wood to be retained in the units. The creation of snags is to be made with 18 inch or greater diameter trees, one per acre. There was discussion on the value of creating snags from the best trees or leaving them to grow into the biggest trees. Botanically the biggest trees are the best places for lichens to grow. Bird species require complex tree structure for nest trees which are not always the biggest trees but trees with forks or damage. The wildlife biologist will make a determination depending on resulting stand structure after survey entire units.

Another issue was the requirement of whole tree logging to reduce fine fuel loading in the stands after logging. This means top of trees would be pulled to the landing along with its branches, piled and burned, leaving less wood/fine fuels in the unit. However, in reality a lot of those branches are stripped off of the tops as they are dragged to the landing, leaving fine fuels in the woods. Another approach done on the Forest is underburning or jack pot burning after harvest to reduce fine fuel loading. The Engineering Tech also discussed the thinning of designate by description (DxD) and dominant tree release (DTR) gaps. The DxD was to approximately 26 foot spacing of residual trees and the DTR cut generally all the smaller trees to 60 foot from the biggest tree. The treatment adhered to prescription but what can be done better next time is the placement of the gaps. The gaps should be place farther away from the road so it's not a shooting gallery for hunters. Deer like the new growth in the gaps.

Unit 84 moderate thin (EA unit384)*:* The unit was thinned in 2010; the second growth stand was planted in 1950 after regeneration harvest. The treatment target for moderate thinning was to retain about 80 Trees per Acre (TPA) with a 25% variance resulting in a range of 57 to 96 TPA. The thinning DxD was to approximately 24 foot spacing of residual trees, retention areas/skips and DTR/ gaps. Eric and Tom took five plots and they got 66 TPA – meeting within the recommended prescription.

Red Tree Vole non-priority site analysis was done for this

subwatershed. In future RTV surveys not needed for treatment/harvest in this watershed. Trail clean-up of logging slash was done concurrently to ensure OHV trails would be usable as soon as possible.

The skid trail to access the unit was subsoiled after harvest was completed by a grapple machine. Wood was stacked for firewood but not removed; contractor finished unit before could get firewood out and had to subsoil to comply with contract. Also unit was finished in July which is not a good time to seed spur road. If seed in July seed becomes bird food, too dry for germination. Seeding with native species would complete with weeds that are now spouting in spur road. These openings of spur roads are seeded with species or grasses that are edible for deer and elk and are considered short term forages areas.

Gaps are placed outside riparian reserves and away from roads for big game security. The dominant tree in the center of the gap and on the outside edge of the gaps grows faster than the thinned portion of the units. The Young Stand Study done on the HJ Andrews Forest supports this result. A question was asked about putting gaps next to Old Growth, which may make sense in a way but one issue in the EA was to maintain Interior Habitat.

Unit 35 heavy thin (EA unit 335): The unit was thinned in 2010; the second growth stand was planted in 1965 after regeneration harvest. The treatment target for heavy thinning was to retain about 55 Trees per Acre (TPA) with a 25% variance resulting in a range of 42 to 70 TPA. The thinning DxD was to approximately 28 foot spacing of residual trees, retention areas/skips and DTR/ gaps. Eric and Tom took four plots and they got 39 TPA – just outside the recommended prescription. See the following enclosed photo.

Non-fish bearing permanently flowing streams retain 100 foot wide no harvest zones on each side of the banks. Retention confirmed. Some discussion that originally miss-classified but presale gave correct buffer. Aquatics would like to thin within these dense second growth buffers to accelerate late-successional structure and potentially provide large wood for streams sooner. Difficult to do with NOA consultation, personal values get in way of actual on the ground needs. Must meet Aquatic Conservation Strategy Objectives and disclose short term effects vs. long term goals early on in process. In ACSO with "Maintain and Restore…" have to be careful with site specific circumstances, in past have conserved "do no harm" – such as: no

change to stream temperature and erosion into stream. Want to make sure there is a site specific reason to thin within Riparian Reserves and there is a restoration focus.

More slash in logging corridor than want, could do jackpot burning.

New proposed Critical Habitat rule support this type of thinning. Analysis needs to demon straight clear benefits in 30 years. ***Unit 217:*** Three DTR were grouped to create large opening, a little more than ¾ of an acre. The gaps provide short term forage, and bird habitat. If Rhody takes off may not be good deer habitat. Gap placement must factor in plant associations.

Middle Fork Ranger District 2013

Background: The Calapooya Divide Meadow Restoration 1 and 2 Decision Memo was signed April 28, 2010 and Sept. 8, 2010, respectively. The intent of the project or Purpose and Need: Implement meadow restoration and enhancement activities in areas where conifer encroachment is a threat to meadow plant communities.

Office: Introductions by Duane Bishop. Suzanne Schindler gave the objectives of the review which was to evaluate the consistency of project design and implementation; and learning for future projects. Deputy Forest Supervisor Expectations by Gordy bloom: wanted an integrated discussion on evaluation of completed projects. Molly gave safety briefing and overview of project and history.

Field: 3 stops

Stop 1- Gertrude Lake

It was a beautiful summer day at Gertrude Lake. Around the edges of the lake trees less than 12 inches were cut and piled to keep the meadow open. The felled trees were pile and most are scheduled to be burned.

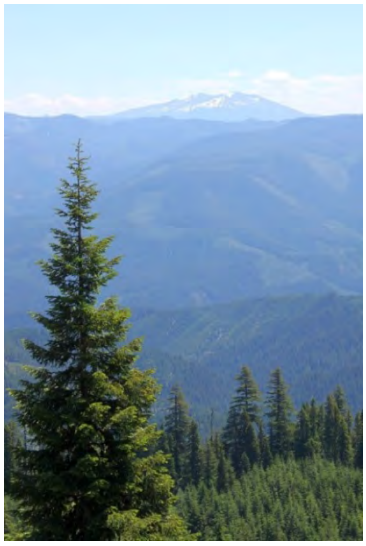
Steve Hamilton talked about the Native Americans using this area as part of their travel routes, till about 1910. They left lithic scatter sites composed of fragments of jasper and obsidian which need to be protected. Some slash piles were placed on these site and they had to be moved. It is ok to walk around and visit these areas but burning slash piles on these sites can cause damage.

Trees were not cut within 10 meters of wetland to protect Crater Lake tight coil snail.

When the fire crew finishes burning the slash piles the District will have the spur road closed. This will prevent potential disturbance to the meadow from off road vehicles.

Stop 2 - Lunch at Grass Mtn.

Trees smaller than 12 inches were cut in and around the meadow, then burned by the fire crew on September 30, 2011. This was a perfect example of tree encroachment into meadows. By burning, other meadow species can occupy the site. No invasive species were found. This was an old fire lookout site and historic old photos were shared during lunch.



Stop 3 - Bristow Prairie

The same treatment was prescribed for the Bristow Prairie meadow enhancement: cut trees less than 12 inches and burn to reduce fuels. Keep large tree mortality from burning less than 10%.

What's different is the burning in leave islands of trees and that the treatment is preventative. Tree islands were thinned by fire. Also burning now will keep the 62 acre meadow big - will retain meadow longer. Intent is was to kill smaller conifers with fire but harder to do consistently with light burn; so have YCC crew also lop and scatter unwanted tree encroachment.

One of the lessons learned was the management of the funding sources. The timing of when dollars were to be spent was important; some funding had a two year cycle and others had a one. There were four funding sources: Payco, FS, Rocky Mountain Elk foundation and Challenge Cost Share.

Also learned if you burned late enough in the fall you may not have to mop up if hit just right before the rain and snow starts. Middle Fork RD coordinated burning with McKenzie River District.

No real weed problem because of high elevation and so far away from most recreation travel. Burning refreshed and retained a wide verity of meadow plant species that were used by butterflies.

Wrap up – SO and District staff all share brief observations from the review.

Some team comments:

- Can't forget to think about road access to meadows and close them.
- Nice to see different projects and focus on integrated Wildlife, Botany and Fire program work.
- Like to see the meadow restoration work and have respect for what the Forest Service does.
- May want to see if can utilize some of the wood burned, maybe post and poles for fencing.
- Would like to see more fire inserted into landscape.
- Liked talks about Native American use and historic structures that existed. Also good to know Archeology has input and what the estimated time it takes to do the review work.
- With burning there is sometimes only a one day window to burn and would like to have lee way to do so and sometimes that means postponing a meeting.

Thanks to Molly for leading monitoring trip and all the folks who spoke about their resource.

Deputy Forest Supervisor:

Thanks to Eleanor and John, from the North American Butterfly Association, for participating and giving their time and input to our monitoring review. It's valuable feedback and important to share our work.

Accomplishments

The following table compares the actual accomplishment of selected Forest Plan objectives during the fiscal year 2012 (FY12), and fiscal year 2013 (FY13), October 2011 through September 2013) with the predictions in the Forest Plan (Chapter IV, pages IV-10 to IV-12). Also shown are the cumulative outputs and accomplishments since the Plan was implemented. The cumulative results are expressed as average annual. This provides the closest comparison to the Forest Plan averages, which are based on a 10-year planning period.

Outputs may vary annually for many reasons including year-to-year scheduling decisions, market conditions, budget appropriations, and even weather conditions. Thus, comparison of a single year may not provide enough information for an adequate evaluation. As we continue to monitor over several years, trends or averages of accomplishments will provide a better basis for evaluation.

The Northwest Forest Plan was the basis for significant modifications to land allocations and to Standards and Guidelines. With these changes coupled with declining budgets, notable differences between Forest Plan projections and subsequent accomplishments are evident. The following table (Summary of Program Accomplishments) reflects adjustments to the Forest Plan projections for timber related activities; however, no other projections were altered.

Summary of Program Accomplishments

Output or Activity	Units	Projected Forest Plan Level	FY 2012 Accomplishment		FY 2013 Accomplishment[1]	
			Units	*%*	*Units*	*%*
RECREATION AND WILDERNESS						
National Forest Visits [2]	Visits	--	1,387,000	**Projected recreation estimates made in the Forest Plan no longer apply. Methods and units for measuring recreation us have change substantially. The units reported represent 2012.**		
Site Visits [2]	Visits	--	938,000			
Wilderness Recreation Use [2]	Visits	--	105,000			
Trail Construction/Reconstruction	Miles	78.0	8.1	10%	48.9	63%
TIMBER MANAGEMENT						
Timber Sale Program	MMBF	136.0	74.1	54%	85.7	63%
Timber Harvest Treatments						
Regeneration Harvest	Acres	3,144.0	11	>1%	0	--
Commercial Thins	Acres	2,808.0	2,770	99%	3,629.0	129%
Partial Harvest	Acres	--	264	--	0	--
Other	Acres	--	434	--	3	--
Timber Stand Improvement	Acres	18,100.0	3,045	17%	3,629	20%
Reforestation	Acres	3,144.0	607.0	19%	93.0	3%
Fuel (Slash) Treatment	Acres	3,144.0	1,032.0	33%	830.0	26%
ROAD MANAGEMENT						
Road Construction	Miles	40.0	0.0	0%	0.0	0%
Road Reconstruction	Miles	174	0.0	0%	0.0	0%
Roads Closed	Miles	890	1,254	141%	1,254	141%
Roads Suitable for Passenger Car	Miles	1,580	528	33%	528	33%
Roads Suitable for High Clearance Vehicles	Miles	4,530	4,932	109%	4,932	109%
FISH / WATER / WILDLIFE / LIVESTOCK						
Watershed Improvement	Acres	533.0	2811.0	527%	2305.0	432%
Anadromous/Inland Fish Habitat Improvements	Miles	12.0	271.0	>2000%	49.0	408%
Wildlife Habitat Improvements	Structures	451.0	--	--	--	--
	[2]Acres	--	25,148	--	16,093	--
Livestock Grazing (AUMs)	AUMs	200.0	0	0%	0	0%

[1] In response to the need for accurate recreation use data, the National Visitor Use Monitoring project was developed at the National level and is being implemented by all National Forests. This process provides a consistent methodology for scientifically credible, repeatable, reliable, and defensible set of recreation use data.

[2] Projected wildlife estimates are no longer measured in structures but in acres. For tracking purposes we will report in acres.

Forest Plan Amendments

Your Forest Plan is a dynamic document that can be amended in response to:

- *Errors and/or discrepancies found during implementation.*
- *New information.*
- *Changes in physical conditions.*
- *New laws, regulations, or policy that affects National Forest management.*

We frequently learn about the need for amendments through monitoring.

Since first published in the summer of 1990, there have been 55 non-significant amendments to the Willamette National Forest Plan. In addition, during 1994 the Northwest Forest Plan was completed and amended all Forest Plans in the range of the Northern Spotted Owl including this Forest. Because all Forest Plans were amended at the Regional level, the amendment did not receive a number.

The following summarizes the amendments to the Forest Plan:

Forest Plan Amendments

Amendment	Implementation Date	Type of Change
1	10/30/1990	Vacates Regional Guide for spotted owls. (Decision by Assistant Secretary of Agriculture John Evans; Federal Register Notice published 10/03/1990.)
2	12/10/1990	Allows snowmobile use in certain parts of Santiam Pass area.
3	8/5/1991	Corrects errors and omissions in Forest Plan (errata).
4	8/5/1991	Requires roadside brush management methods be consistent with scenic resource needs and allows machine mowing.
5	8/5/1991	Corrects mapping error in boundary of Diamond Peak Wilderness.
6	8/5/1991	Changes and clarifies direction about retention of downed wood to better meet functional and operational objectives.
7	3/22/1992	Established Management Plan for the McKenzie Wild and Scenic River; places the river in a new Management Area(MA), MA-6d; and establishes a new Special Interest Area Carmen Reservoir.

Forest Plan Amendments

Amendment	Implementation Date	Type of Change
8	3/22/1992	Establishes Management Plan for the North Fork of the Middle Fork of the Willamette River Wild and Scenic River; places the river in a new Management Area, MA-6e; and changes the scenic allocation of about 29,000 acres of viewshed near the river from Modification Middleground to Partial Retention Middleground.
9	2/20/1992	Changes official Forest Plan Map from manually drafted management areas on mylar USGS quadrangles to a digital version on Forest's Geographic Information System.
10	3/14/1992	Changes about 67 acres in Spring Butte area (Rigdon) from General Forest (MA-14a) to Special Habitat Area (MA-9d).
11	3/14/1992	Changes about 65 acres in Beaver Marsh area (Rigdon) from Special Interest Area (MA-5a) to Special Habitat Area (MA-9d).
12	4/4/1992	Adds Habitat Conservation Areas (HCAs) for northern spotted owl and adopts the standards and guidelines recommended by the interagency Scientific Committee. (Decision by Assistant Secretary of Agriculture James R. Moseley.)
13	7/29/1992	Makes initial allocation of about 640 acres of land acquired by land exchange not far from the South Pyramid area on the Sweet Home Ranger District to General Forest (MA-14a).
14	7/29/1992	Changes about 51 acres in the Long Ranch area, Sweet Home Ranger District, from Dispersed Recreation - lakeside Setting (MA-10f) to Special Habitat Area (MA-9d).
15	7/6/1992	Adds standard and guideline MA-1-20a to clarify that the visual quality objective for wilderness is Preservation, and deletes FW-059.
16	7/29/1992	Establishes new Management Area, Integrated Research Site (MA-3b) to support research on long-term site productivity on about 1,500 acres on Blue River Ranger District, and moves a pileated woodpecker site within the area. Also, relabels the H.J. Andrews Experimental Forest as MA-3a.
17	2/17/1993	Extends deferment of timber harvest and road construction in the Opal Creek area for up to an additional two years to allow time for resolution of various issues surrounding management of the area, including decision about how the Forest Service will meet Recovery Plan objectives for the northern spotted owl.
18	2/17/1993	Clarifies direction in Forest-wide standard and guideline FW-018 to provide more site-specific and objectives-based analysis for placement and remedial actions associated with dispersed campsites.
19	6/2/1993	Relocates about 1,100 feet of Bornite Brook and 900 feet of Vanishing Creek, and by so doing interchanges the actual location of affected lands between MA-14a and MA-15. Upon reclamation of the bornite project's tailings impoundment, creates about 5 acres of wetlands converting that acreage from MA-14a to MA-15.

Forest Plan Amendments

Amendment	Implementation Date	Type of Change
20	5/17/1993	Adds S&G to require an integrated management approach for weed management. After identification, noxious weed sites should be analyzed for the most effective control methods, based on site-specific conditions.
21	6/23/1993	Makes initial allocation of 123 acres acquired through land exchange on the Blue River RD, 59 acres allocated to MA-5A (Gold Hill SIA); 64 acres allocated to MA-11d near Blue River Reservoir.
22	11/24/1993	Allows temporary reduction in availability of elk cover in Mill Creek and Anderson Creek High Emphasis areas (McKenzie RD) to allow stand management practices which will accelerate the development of high quality cover.
23	1/5/1994	Establishes the Forest's Special Forest Products Management Plan, including implementing direction through several new Forest-wide S&Gs.
	5/20/1994	Establishes land allocations and S&Gs as described in the Record of Decision for Amendments to the Forest Service and Bureau of Land Management management plans.
24	9/29/1994	Changes 1/2-acre in the Westfir area from Scenic-Partial Retention (MA-11c) to Special Use-Permits (MA-13a).
25	5/26/1995	Modifies the S&Gs for riparian reserves, wildlife tree provisions, and fueling loadings in MA-3b and AMA Long-Term Ecosystem Productivity project. This was a nonsignificant amendment to the Forest Plan.
26	5/17/1995	Modifies the S&Gs for visual objectives, big-game management, and the retention of large woody material. This was a nonsignificant amendment to the Forest Plan.
27	6/22/1995	Designates approximately 110 acres as MA-9d, Special Wildlife Habitat, in the Heart Planning Area on the Oakridge RD.
28	11/29/1995	Designates the electronic site as a Special-Use-Permits area (MA-13a). Prior to this decision the site was located within Scenic-Modification Middleground (MA-11a). For specifics see Santiam Cellular Environmental Assessment and Decision Notice.
29	1/12/1996	Expand the current Special-Use-Permit area (MA-12b) from 732 acres to 802 acres. Master Plan provides for improvements to the alpine ski facility, as well as adding other year-round recreational opportunities. For specifics see the Hoodoo Master Plan FSEIS and ROD.
30	4/17/1996	Within the Browder Cat timber sale boundary, decreases riparian reserve widths to 50 feet for both sides on four intermittent streams within and adjacent to harvest units and establishes riparian reserves of 175 feet for both sides on two perennial non-fish bearing streams adjacent to a proposed unit.
31	5/15/1996	Established the Rigdon Point RNA.

Forest Plan Amendments

Amendment	Implementation Date	Type of Change
32	9/4/1996	Decreases the interim Riparian Reserve widths 21 acres for Class IV streams and 5 acres for Class III within the Augusta Timber Sale Planning area located in South Fork McKenzie Tier 1 Key Watershed.
33	1/23/1997	Assigns a management area to recently acquired land in the following way: 13 acres to McKenzie River Wild and Scenic River corridor (MA 6d), 11 acres to Scenic Partial Retention/ Middleground (MA 11c) and .25 acres to Special Interest Area (MA 5a).
34	1/23/1998	Changes approximately 1,900 acres of land from Scenic Modification/Middleground (MA 11a) to General Forest (MA 14a) and removes 275 acres of inventoried roadless area on the Middle Fork Ranger District.
35	5/17/1997	Temporarily reduced winter range cover for elk in a high elk emphasis area below the 0.5 Habitat Effectiveness rating required by S&G FW-149 in the Robinson-Scott project area.
36	7/8/1997	Establishes new S&Gs for four sensitive plant species; Gorman's aster, *Aster gormanii;* Common adders tongue, *Ophioglossum pusillum;* selected populations of tall bugbane, *Cimicifuga elata;* and selected populations of Umpqua swertia, *Fraseran umpquaensis.*
37	5/19/1997	Assigns initial allocations for about 2,180 acres of acquired lands located on Detroit and Sweet Home Ranger Districts.
38	1/21/1998	Changes management emphasis to provide for a proposed action to build a replica fire lookout station museum on the Lowell Ranger District.
39	6/1/1998	Establishes two new communication sites on the Sweet Home Ranger District. The development involves less than 1/4 acre.
40	7/13/1998	Establishes the 2,877 acre Torrey-Charlton Research Natural Area (RNA). The RNA spans over both the Willamette and Deschutes National Forests.
41	8/24/1998	Establishes two new communication sites on the Detroit Ranger District. The development involves less than 1/4 acre.
42	8/30/1999	Allows the Forest to continue a program of noxious weed treatment based on the type of infection.
43	2/15/2000	Changes approximately 1,060 acres of MA 14a (General Forest) to MA 9b (Pileated Woodpecker habitat). Also a slight modification of MA 10e (Dispersed recreation) with no net change in acreage.
44	12/21/2001	Established the Waldo Lake Management Plan which addressed management issues in and around the lake. This decision has since been rescinded.
45[1]	7/1/2002	Establishes Opal Creek Scenic Recreation Area as Management Area 2C and includes goals, objectives, and Standard & Guidelines. [1]This Amendment 45 was inadvertently missed causing two amendments to be labeled Amendment 45.

Forest Plan Amendments

Amendment	Implementation Date	Type of Change
45[2]	6/16/2004	Thins 5.2mmbf on approximately 491 acres within management areas LSR and AMA. Three units are within Three Creek Old-Growth Grove requiring a non-significant Forest Plan amendment.
46	8/22/2006	Exempted the project from strict compliance with five specific Forest Plan standards and guidelines relating to the amount of even-aged harvest and size of harvest units within trail corridors and scenic allocations.
47	4/16/2007	Waldo Lake Managing Recreation Use – Phased in a prohibition internal combustion boat motors on Waldo Lake and the use of internal combustion engines (chain saws, generators, etc.) in the dispersed, nonmotorized management area around the lake.
48[1]	6/25/2007	Updated the Forest Plan direction concerning the prevention and control of invasive plants to be consistent with the Region 6 USFS ROD for Preventing and Managing Invasive Plants.
48[2]	8/31/2007	Huckleberry Flats OHV Trail Expansion - Changed the designation of the Huckleberry BGEA (Big Game Emphasis Area) from Medium Emphasis to Low Emphasis and changed the designation of the adjoining South Christy BGEA from Medium Emphasis to High Emphasis.
49	10/22/2008	There are two parts to this amendment. First an implementation guide was not created for the Santiam Wagon Road. Second Standard and Guideline MA-10b-04 as changed to limited travel of all wheeled motorized vehicles to only designated trails and/or roads.
50	4/18/2008	Forest Plan Amendment #50 for Bridge Thin was required because we proposed work in the McKenzie River SIA, but had no Implementation Guide completed, which is required under the Forest Plan.
51	5/26/2009	Changed the location of MA9c- marten habitat from its current location. The new location is of higher quality habitat fuel reduction treatments could also take place.
52	10/15/2009	Travel Management Rule Amendment prohibits motorized travel off of a designated system travel routes in all Management Areas.
53	12/15/2010	Expanded the Gold Lake RNA to 463 acres. The original RNA did not incorporate the key wetland system.
54	04/24/2014	Reallocated 906 Acres of Dispersed Recreation Semiprimitive Non-Motorized Recreation Area (10e) to Special Wildlife Habitat Area (9d).
55	06/06/2014	Thin ninety-five acres are in two plantations (45 and 47 years old) in the Three Creeks Old Growth Grove located within the South Santiam Late Successional Reserve

Forest Plan Updates

Forest Plan Amendments (discussed above) change decisions made by the Forest Plan, consequently, they also require environmental analysis under the National Environmental Policy Act (NEPA). From time to time other changes to the Forest Plan are needed which are not intended to affect earlier decisions or Plan objectives. Examples of such changes include corrections; clarification of intent; changes to monitoring questions; and refinements of management area boundaries to match management direction with site-specific resource characteristics at the margin. We call these types of changes "Updates." Since they do not change any Plan decision, they do not require NEPA analysis. F

There have been eight updates to the Forest Plan:

Forest Plan Updates

Update	Implementation Date	Type of Change
1	7/6/1993	Makes two minor management area boundary adjustments on the Oakridge Ranger District (RD). Two acres were changed from MA-6e to MA-9d to correct a boundary line running through a pond. Two hundred sixteen acres were changes from MA-11c to MA-14a so management for visual sensitivity would better match actual topographic characteristics.
2	10/18/1993	Clarifies the Forest-wide S&Gs for prescribed fire in nonwilderness. Accomplishes this by deleting FW-248 through FW-252 and substituting in their place rewritten FW-248 through FW-250. The changed S&Gs better reflect management intent to conduct objectives-based fuels analysis considering a range of resource protection and enhancement needs appropriate to site-specific conditions.
3	10/18/1993	Updates and reprints the Forest's Monitoring Tables from Chapter V of the Forest Plan. Eliminates duplication, improves clarity, and refines data, and analysis requirements to better address monitoring concerns.

Forest Plan Updates

Update	Implementation Date	Type of Change
4	10/17/1994	Special Forest Products (SFP) Table IV-32a shows a type of collection allowed by management area. To clarify that the exclusion of commercial SFP collection applies only to the large, mapped Late-Successional Reserves (LSR) and not to all of the owl activity centers that are now 100-acres LSRs.
5	12/15/1995	Updates pertaining to the role of natural fires in Wilderness. Insures direction for prescribed natural fire is consistent with Wilderness policy through adjustments to the Forest Management Goals, Desired Future Condition, Forest-wide S&Gs, Management Area prescriptions, and Monitoring Questions.
6	1/23/1997	Updates to the Forest Plan Map of Record with changes to Swift Creek (MA 10f); corrections to 100 acre Late Successional Reserves (MA 16b), an AMA designation correction (MA 11f to MA 17), and a Hoodoo Master Plan boundary correction (MA 12b).
7	8/31/1998	Updates the Forest Plan Map of Record with refinements to the LSR222 boundary, establishment of MA 13B for the Middle Fork Ranger Station, the incorporation of Pileated Woodpecker and Marten areas, changes to 7 owl cores on the McKenzie RD and one on the Lowell Ranger District, the location of the already established Huckleberry Lookout (MA 13b) onto the Map of Record, the assignment of management allocations to newly acquired private land, refinements to the boundary of the McKenzie work center.
8	4/3/2000	Updates the Forest Plan Map of Record with RNA boundary refinements, the creation of Ma 1 for Opal Creek Wilderness and MA 2C for Opal Creek Scenic Area; an update that finalizes the boundary of the North Fork of the Middle Fork Wild and Scenic River, small refinements of the Forestwide wilderness boundaries, an LMP layer adjustment to reflect private land changes, adjustments to the boundary of Hills Creek LSR to allow scenic enhancement activities, and the creation of a MA 6b for the Elkhorn Wild and Scenic River.

Forest Plan Updates

Update	Implementation Date	Type of Change
9	4/9/2001	Documents the change of Inventoried Roadless Area maps from paper copies to an electronic Geographic Information system layer in the Forest Planning records.
10	10/17/2002	Updates the Forest Plan Map of Record with a Guistina Land Exchange of 173 acres for 237 acres; correct Shadow Bay campground from 12a to a 12b; vertical integration of administrative boundaries; update with the Finberry Timber Sale, correct the Three Creek RNA boundary; change land allocation from 11c to 13a at Carmen Air Quality Monitoring Site; reflect the Drury Land Purchase of approximately 28 acres; add names of special features into the layer, change an allocation from 14a to 12a on Timber Butte Lookout; and finally add the boundaries of the seed orchards.
11	6/21/2006	Updates to the Forest Plan Map of Record. The updates included labeling errors to Opal Creek Wilderness and to Hills Creek Reservoir. Two other updates included refining the boundaries to 100 acre LSRs in the Blowout Thin EA and correcting a previous error in a Bald Eagle Management Area across from Hills Creek Reservoir. None of the updates resulting in significant change nor was a result of a change in direction. A final change to added several Bald Eagle Management Areas to the Map of Record was requested. No additional areas were added because no NEPA documentation supporting the areas was available.
12	5/19/2008	Updates the name of our elk emphasis' area from "Old Squaw" to "Latiwi". No boundary changes
13	9/5/2008	Adds the McKenzie Bridge Airstrip as a Management Area 13b.
14	9/17/2009	The updates stem from corrections to boundaries and from labelling errors. Updates included one 100 acre LSR, the Federal Highway Administration Easement, Hills Creek Reservoir, private land acquisition, Flat Creek warehouse, AMA Research Plots, Olallie Creek RNA, and a Pine Marten change documented in Amendent 51. A map of the changes are available.

List of Contributors

The principal contributors to the 2010 Monitoring and Evaluation Report are listed below. Please contact one of us if you have questions or want further information about the reported results.

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