

United States
Department of
Agriculture

Forest Service

Pacific
Northwest
Region



Monitoring and Evaluation Report

Willamette National Forest

Fiscal Years 2014 - 2015



*Little Fall Creek,
Middle Fork Ranger District*

Welcome to the 2014 and 2015 Willamette National Forest annual Monitoring and Evaluation report. This is our 25th 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 Willamette National Forest's land management monitoring program has been modified to conform to the new monitoring requirements in the 2012 Planning Rule. I think this plan provides a comprehensive, yet affordable monitoring program that fits together well with inventory and monitoring efforts at the province, regional and national levels. Though the final monitoring plan was circulated in [August 2015](#) it did not get much feedback during the public review process. In February 2017, I again have made improvements to the monitoring program. This report reflects those changes. I welcome your continued involvement and any thoughts you may have to improve our monitoring in the future. Under the new 2012 Planning Rule improving our monitoring program is simpler.

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,



Tracy Beck

Forest Supervisor

Willamette National Forest

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MONITORING AND EVALUATION REPORT

This report focuses on the monitoring and evaluation of the Forest Plan with question worked within the Planning 2012 Monitoring Framework. The document provides an overview on how the Plan’s management direction is being implemented and an evaluation of the current conditions under the 2012 Monitoring Framework. 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.

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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 prepared a new Monitoring Strategy that met the requirements of the 2012 Planning Rule. This document is the first publication that will be following the 2012 Planning Rule Monitoring Strategy.

Monitoring Strategy

The 2012 Planning Rule (36 CFR 219) required the Willamette National Forest (the Forest) to establish a land management plan monitoring program that is consistent with the new Planning Rule's monitoring requirements. The monitoring strategy includes a new set of questions intended to replace the old and dated questions found Chapter V in the Forest Plan. Questions are developed and addressed at a scale appropriate to the question. This may be plan level or broad scale.

The plan monitoring program is a required element of the plan. It is designed to test whether assumptions made during planning were accurate and to track progress towards meeting the desired conditions set out in the plan. Information from monitoring efforts informs the Forest Service and the public as to whether a change to the plan is necessary.

The plan monitoring program must contain one or more monitoring questions that address the following items (36 CFR 219.12):

2012 Monitoring Plan Strategy Questions

- i. The status of watershed conditions*
- ii. The status of ecological conditions including key characteristics of terrestrial and aquatic ecosystems*
- iii. The status of focal species*
- iv. The status of the ecological conditions necessary to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern*
- v. The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives*
- vi. Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area*
- vii. Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple-use opportunities and social, economic and cultural conditions*
- viii. The effects of management activities to determine that they do not substantially and permanently impair the productivity of the land*

Importantly, monitoring questions developed for the plan monitoring program must be “within the financial and technical capability” of the Forest Service, meaning that the Forest Service must have the money and ability, including support from partners, to actually carry out the strategic monitoring outlined in the plan monitoring program. The Forest Service will

be monitoring the effectiveness of the forest plan as a whole, which is a separate process from the monitoring of site-specific projects like timber sales or road construction. The plan monitoring program should be designed so that monitoring is efficient, complementary, and occurring at the appropriate scale.

In concert with the 2012 Planning Rule, the monitoring report will be biennial as opposed to annual.

There is a section towards the end name 'Implementation Monitoring'. Implementation monitoring or project monitoring is a valuable means of understanding the effects of projects and activities. The Forest continue to ask the question, "Did we do what we said we were going to do?" by following the steps below.

- 1. 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?"*
- 2. Publish a report displaying the results of monitoring and an evaluation reviews.*

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

Summary of Monitoring Findings

The following is a summary of FY14 and FY15 monitoring questions designed to assist the Forest Supervisor in determining the effectiveness of the Forest Plan Standards and Guidelines as well as meeting the 2012 planning rule. This section is organized along the 8 core questions and in adherence to 2012 Planning Rule.

Watershed Conditions

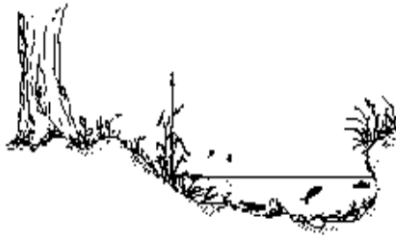
The Forest Standards and Guidelines provide direction to enable the Forest to meet the goals of maintaining and improving water quality, soil productivity, and air quality. Forest plans are also required to include direction to maintain and restore the ecological integrity of riparian areas. The 2012 planning rule includes a strong set of requirements associated with maintaining and restoring watersheds and aquatic ecosystems, water resources, and riparian areas in the plan area. We have focused our monitoring strategy on priority watersheds that require restoration of structure, function, composition, and connectivity of aquatic ecosystems and watersheds.

(i) The status of select watershed conditions.

	Monitoring Question	Indicator(s)	Monitoring Results
<i>Water Conditions</i>	<i>i.a.</i> Are Standards & Guidelines maintaining or improving watershed conditions?	Watershed Condition Framework (WCF) analysis of key indicators at the 5th and 6th field watershed scales.	Results OK
<i>BMPs</i>	<i>i.b.</i> Have Best Management Practices been implemented and are effective at managing water quality consistent with Clean Water Act?	Temperature and turbidity	Results OK

Table 1: Monitoring sub-questions addressing status of select watershed conditions.

Watershed Conditions



i.a) Are Standards and Guidelines maintaining or improving watershed conditions?

Watershed Condition Framework (WCF) is tool that the Forest uses to gauge changes in watershed condition. WCF is a national initiative that directed Forests to assess and score each of the 6th field watersheds within the Forest based on aquatic habitat condition, fish distributions, water quality, road densities, and other metrics. Watersheds were given a rating of 1 (properly functioning), 2 (partially functioning) or 3 (not properly functioning) based on an assessment conducted in 2010. The Forest subsequently identified “priority” sub-watersheds and developed Watershed Restoration Action Plans (WRAPs) that identified the restorative actions needed to improve the condition of these sub-watersheds. The Forest currently has four subwatersheds identified and is implementing restoration projects identified by these WRAPs. The table below gives the four priority sub-watersheds where we are implementing restoration projects and the projected year of completion of all essential projects in each WRAP. Find more information about WCF at http://www.fs.fed.us/biology/watershed/condition_framework.html/

Table 2: Willamette National Forest Priority Sub-watersheds and Projected WRAP completion years.

Priority Sub-watershed	Completion year for WRAP	Associated Ranger District
Staley Creek	2017	Middle Fork
Marion Creek	2018	Detroit
Cougar Creek	2019	McKenzie River
Soda Fork Creek	2020	Sweet Home

Best Management Practices



i.b) Have BMPs been implemented and are they effective at managing water quality consistent with the Clean Water Act?

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 by 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.

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 2014, 80 sites were successfully monitored during summer, and of these 80 sites, 42 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 2015, 63 sites were monitored and 30 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.

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>). This effort has taken the collected and quality controlled data at several sites on the Willamette National Forest and used it to look at status and trends of water temperature over the last three decades, as well as modeling climate scenarios for future decades. In addition, the Aquatic and 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.

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. In 2014 testing included BMP monitoring at seven sites related to water uses, recreation, road work, and timber harvest. In 2015, BMP monitoring occurred at another 7 sites related to in-stream restoration, recreation, road work, timber harvest, prescribed fire and water uses on the Forest. These efforts have been interdisciplinary and have monitored both implementation and effectiveness of BMPs used to protect water quality at each location. 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) that was completed in 2015 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. As part of this analysis, risk for both acute and chronic sources of sediment from roads into streams was 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.

Terrestrial and Aquatic Ecosystems

Under the 2012 planning rule, land management plans will include components to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems in the plan area, including preventing invasive species while protecting soil, aquatic resources in the plan area.

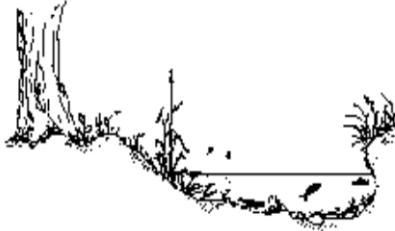
Below is a summary of FY14 and FY15 monitoring questions designed to assist the Forest Supervisor in determining the effectiveness of the Forest Plan Standards and Guidelines in protecting and maintaining the terrestrial and aquatic ecosystems while meeting the 2012 Planning Rule.

(ii) The status of select watershed conditions including key characteristics of terrestrial and aquatic ecosystems.

	Monitoring Question	Indicator(s)	Monitoring Results
<i>Invasive Species</i>	<i>ii.a.</i> Are S&Gs maintaining or decreasing the spread of aquatic invasive species?	Includes non-native fish species (brook trout, bass, crappie, etc.) as well as aquatic invasives (New Zealand mud snail, zebra mussel, whirling disease, and non-native plants), aquatic and riparian.	Results OK
<i>Aquatic</i>	<i>ii.b.</i> Are Standards and Guidelines maintaining or improving aquatic habitat (instream, lake, and riparian areas)?	1. Core & integrated targets 2. Habitat data of current condition 3. Management related impacts to aquatic systems	Results OK
<i>Survey & Manage</i>	<i>ii.c.</i> Are project contributing to the persistence of botanical Survey and Manage species?	Number of S&M sites identified and protected during project planning.	Results OK
<i>Weeds</i>	<i>ii.d.</i> Are known populations of invasive plants continuing to spread? Are new infestations occurring?	Acres of surveyed lands with new and active invasive species infestations; Acres treated.	Results OK

Table 3: Monitoring sub-questions addressing terrestrial and aquatic ecosystems.

Invasive Species



ii.a) Are Standards and Guidelines maintaining or decreasing the spread of aquatic invasive species?

The Willamette National Forest does not directly monitor population trends or distribution of aquatic invasive species (AIS). Data concerning these species is collected incidentally through routine stream surveys and by the regional Aquatic and Riparian Effectiveness Monitoring Program (AREMP). The lack of a statistically rigorous monitoring program does not allow the Forest to draw any conclusions on trends or distribution. Rather than focus the Forest's limited resources on trend determinations, the Forest has invested in prevention programs and measures to reduce the spread of AIS in areas of high risk.

In 2014/2015, the Forest invested in a hot-water pressure wash system for boats at Detroit Lake. This allows visitors to effectively clean their watercrafts prior to launch. Combined with educational materials, signage, and presentations by Forest Service staff and partners, a major vector for the spread of aquatic invasive species has been reduced at Detroit Lake.

The Willamette National Forest worked closely with Oregon Department of Fish and Wildlife (ODFW) in 2014/2015 to eliminate the stocking of high lakes with invasive Brook Trout. Brook Trout were stocked for decades in the high lakes due to their ability to tolerate harsh environments. However, the majority of the high lakes were historically fishless and the introduction of Brook Trout had negative consequences for native communities of amphibians and other aquatic organisms. Escapement of Brook Trout from the high lakes to the rivers containing native Bull Trout was hindering efforts to recover this Threatened species. Through collaborative efforts between the Forest Service and ODFW, the total number of high lakes in the stocking program has been decreased and Brook Trout are no longer a species that is utilized.

The Forest has continued to invest in signage, educational materials, awareness programs, and outreach. The Forest hosts an AIS prevention kiosk at Free Fishing Day events annually. In 2014/2015, the Forest utilized the "Whac-A-Mussel" arcade game that drew in hundreds of children and parents to the kiosk. Forest Service personnel were onsite to provide educational materials and answer questions in an effort to increase awareness. Additionally, the Forest Service works with State partners to ensure that all boat ramps have information regarding AIS prevention.

The Forest continues to use AIS prevention protocols in our standard survey operations. All Forest Service personnel are required to follow prevention techniques and ensure that equipment and Personal Protective Equipment is free of AIS. Staff from other agencies, partner organizations, and contractors are required to decontaminate their equipment prior to working in the stream.

The Region has issued new direction in 2014/2015 for AIS prevention as a result of fire operations. This direction requires fire apparatus and equipment to be mobilized in a manner that reduces the potential for AIS spread. Equipment is cleaned and inspected by Forest Service personnel prior to being entered into service. This regional direction has been included in the educational curriculum for fire staff has resulted in an increased awareness for the risk of fire operations contributing to the spread of AIS.

In summary, the current trend of AIS spread is unknown, however, efforts by the Forest Service have likely reduced the rate of spread by focusing prevention programs on high risk areas. The collaborative effort between the Forest Service and ODFW has resulted in a measurable decrease in a single invasive species spread. The Forest will continue to invest in preventing the spread of aquatic invasive species and has incorporated prevention techniques in several protocols.

Aquatic Habitat



ii.b) Are standards and guidelines maintaining or improving aquatic habitat (instream, lake, and riparian areas)?

Lake monitoring on the Forest in 2014 and 2015 included monitoring of physical and biological properties of Waldo Lake. In addition, developed recreation sites on several reservoirs on the Forest were monitored to determine if high concentrations of potentially toxic blue-green algae were present and in some cases samples were collected and analyzed to determine if toxins were present.

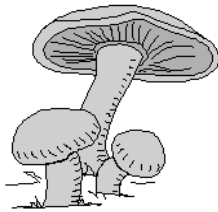
In 2014 and in 2015 under an agreement between the Willamette National Forest and Portland State University (PSU), water temperature data was collected in Waldo Lake from stationary instruments that recorded temperatures at various depths at one location in the lake. Also instruments were deployed by Forest Service personnel and PSU personnel to monitor changes in lake level throughout the year.

During the summer of 2014, samples were collected for zooplankton, phytoplankton and water for chemistry analysis. On September 18, 2015 zooplankton samples were collected

along with water temperature and lake level data. In 2014 and 2015 Secchi depth readings were taken as a measure of water clarity. Measurements indicated high water clarity with a maximum Secchi depth of 41.6 meters recorded on September 10, 2014.

Weekly surveillance monitoring visits were made to developed recreation sites on waterbodies that are known to have had blooms of potentially toxic blue-green algae in the past. Forest Service personnel worked cooperatively with other agencies to monitor potentially toxic algal blooms at some locations during the summer months. 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 public health based thresholds. The Forest used the OHA's toxin based protocol for monitoring potentially toxic blooms. Throughout the summer seasons 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. No developed recreation sites were found to be above the OHA threshold in 2014. A sample collected in Detroit Reservoir on May 13, 2015 was analyzed for blue-green algae

Survey and Manage



ii.c) Are projects contributing to the persistence of Survey and Manage species?

Survey and Manage botanical species are being surveyed for in stands that do not meet a Pechman exemption (thinning under 80 years of age, riparian restoration). In 2014 we documented 49 new sensitive and survey and manage species during inventory of 6256 acres of habitat and in 2015, we documented more than 25 new sensitive and survey and manage species during inventory of 5238 acres of habitat. All Category A, B and C species (protect known sites) were buffered. Some more common species such as *Peltigera pacifica* were buffered in riparian reserves but were not protected in harvested units. All NEPA documents for large scale projects included an analysis of survey and manage species and impacts to them. No projects caused a loss of critical populations for species persistence.

Weeds



ii.d) Are known populations of invasive plants continuing to spread? Are new infestations occurring?

Known infestations are being reduced but invasive plant species follow humans. With an increase in recreational use on the Forest, we see weeds popping up in new places, especially false brome and knapweed. Due to the diligence of our staff, we have eradicated many populations of false brome in the past couple of years.

Our annual treatment program accomplishments included 7033 reported acres in 2014 – 5379 acres using manual and mechanical methods and 1654 acres using herbicide treatment and 5776 reported acres in 2015– 4683 acres using manual and mechanical methods and 1093 acres using herbicide treatment.

Most of the surveys we do for weeds are related to large timber sale projects so that years may go by without surveying areas. Investing in comprehensive surveys for new weed populations is the best investment in the long run because early detection and rapid response to treating species will cost a great deal less to the environment. Unfortunately we lack the staff and funding to implement this strategy.

Focal Species

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. In the 2012 Planning Rule the forest is to concentrate its efforts on “focal species” or species that are pointers of the integrity of the key ecological conditions.

Below is a summary of FY14 and FY15 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.

(iii) The status of focal species to assess the ecological conditions required under §219.9.

Table 4: Monitoring sub-questions addressing focal species ecological questions.

	Monitoring Question	Monitoring Activities	Monitoring Results
<i>Marten</i>	<i>iii.a.</i> What is the trend for mature and late successional habitat above 4000’ elevation needed for marten persistence on the Willamette?	Habitat conditions in mixed conifer forests by index categories. Snag and dead log levels by 5 th field watershed.	Results OK
<i>Pileated Woodpecker</i>	<i>iii.b.</i> What is the trend for mature and late successional habitat needed for pileated woodpecker persistence on the Willamette?	Habitat conditions for pileated woodpecker.	Further analysis needed
<i>Elk</i>	<i>iii.c.</i> What is the trend in elk habitat condition and elk hunting levels and success?	Habitat conditions and populations for elk.	Below desired results
<i>Fish Populations</i>	<i>iii.d.</i> Are S&G maintaining or improving focal fish species populations?	Population surveys of rainbow trout, cutthroat trout, Oregon chub, and Pacific lamprey.	Results OK

Marten



iii.a) What is the trend for mature and late successional habitat above 4000' elevation needed for marten persistence on the Willamette?

Indicator 1. Acres of montane mixed conifer (MMC) forest by late successional forest index categories tracked over time.

The expectation is that this indicator will be addressed in a future Forest Plan monitoring report.

Indicator 2. Changes in snag and dead log levels in MMC relative to historic condition by 5th field watershed on the Forest tracked over time.

Time and funding did not permit an evaluation of changes in deadwood levels in Montane Mixed Conifer forests over time, but the expectation is that it will be reported on in the next 2-year Forest monitoring report. Comparison of current snag and dead log levels at the forest scale and by 5th-field watersheds relative to historic conditions were conducted however (Acker 2015)¹, and detailed information is available in the Willamette NF ecology files. A summary of the findings at the forest-scale is given below. Most 5th-field watersheds follow the forest-wide trends, with some exceptions that are considered when planning projects in those areas.

Montane Mixed Conifer Forest habitat type-Large (> 20 inches diameter) Downed Logs: Current levels of large downed logs are very similar to reference (i.e. estimated historic) conditions.

Montane Mixed Conifer Forest habitat type-Total (> 5 inches diameter) Downed Logs: Current levels of total downed logs are generally within the range of reference conditions, except that the portion of the landscape lacking down wood with a minimum diameter of 5 inches is less than half reference condition (10% of reference condition lacked downed wood compared to 4% in the current condition). This suggests there are adequate levels of downed logs at the forest scale in this habitat type based on historic conditions.

Montane Mixed Conifer Forest habitat type-Large (> 20 inches diameter) Snags: It is estimated there are fewer large snags currently than in the reference condition in this habitat type. In particular, it is estimated that historically 15% of this habitat had no large snags compared to 29% today.

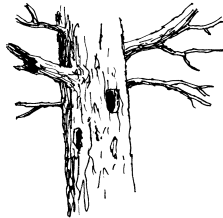
Montane Mixed Conifer Forest habitat type-Total (> 10 inches diameter) Snags: The amount of total snags currently in this habitat type compared to the estimated historic conditions varies

¹ Acker, S. 2015. Deadwood analysis for the Willamette National Forest. Unpublished report, Willamette National Forest, Springfield, Oregon. 8 p.

by snag density category. Fourteen percent of the habitat is estimated to currently have no snags compared to only 6% in the reference condition, but 17% of the current habitat has greater than 36 snags/acre compared to only 8% of the reference condition.

Recent monitoring work suggests that, on the Willamette NF, marten are primarily restricted to the montane mixed conifer above about 4000' elevation, and that most of the 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)². Baited camera set surveys conducted on the Forest from 2012-2015 have detected marten at 90.3% of the stations above 4000' elevation (n=34) and 0% of the stations below 4000' elevation (n=31) (unpublished data, Willamette NF wildlife files).

Pileated Woodpecker



iii.b) What is the trend for mature and late successional habitat needed for pileated woodpecker persistence on the Willamette?

Indicator 1. Acres of lowland conifer/hardwood (WLCH) forest by late successional forest index categories on the Forest tracked over time.

The expectation is that this indicator will be addressed in a future Forest Plan monitoring report.

Indicator 2. Changes in snag and dead log levels relative to historic condition by 5th field watershed on the Forest tracked over time.

Time and funding did not permit an evaluation of changes in deadwood levels over time, but the expectation is that it will be reported on in the next 2-year Forest monitoring report. Comparison of current snag and dead log levels at the forest scale and by 5th-field watersheds relative to historic conditions were conducted however (Acker 2015)³, and detailed information is available in the Willamette NF ecology files. A summary of the findings at the forest-scale for the Montane Mixed Conifer habitat is presented in the marten monitoring discussion. This section addresses current deadwood levels at the forest-scale relative to

² 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.

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/>

³ Acker, S. 2015. Deadwood analysis for the Willamette National Forest. Unpublished report, Willamette National Forest, Springfield, Oregon. 8 p.

reference (i.e. estimated historic) conditions for the Westside Lowland Conifer/Hardwood (WLCH) forest type. Most 5th-field watersheds follow the forest-wide trends, with some exceptions that are considered when planning projects in those areas.

Westside Lowland Conifer/Hardwood Forest habitat type-Large (> 20 inches diameter)

Downed Logs: Current levels of large downed logs are very similar to reference (i.e. estimated historic) conditions.

Westside Lowland Conifer/Hardwood Forest habitat type-Total (> 5 inches diameter) Downed Logs: Current levels of total downed logs are very similar to reference conditions.

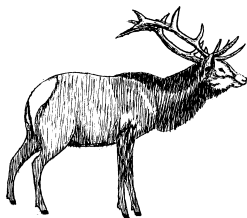
Westside Lowland Conifer/Hardwood habitat type-Large (> 20 inches diameter) Snags: It is estimated there are fewer large snags currently than in the reference condition in this habitat type. In particular, it is estimated that historically 13% of this habitat had no large snags compared to 31% today.

Westside Lowland Conifer/Hardwood habitat type-Total (> 10 inches diameter) Snags: It is estimated there are fewer total snags currently than in the reference condition in this habitat type, especially with respect to the amount of area lacking snags. It is estimated that historically 6% of this habitat had no snags compared to 20% today.

Indicator 3. Occupancy rate of pileated woodpeckers in pileated woodpecker management areas tracked over time.

No occupancy surveys have been conducted in the pileated woodpecker management areas, but surveys are scheduled to be conducted in 2017 and the results are expected to be reported in the next 2-year Forest monitoring report. Incidental observations suggest pileated woodpeckers occur widely across the Forest. The pileated woodpecker is not a Forest Service sensitive species or a species identified by U. S. Fish and Wildlife Service as a species of concern. However, it is a Management Indication Species in the 1990 Willamette Forest Plan and there was a concern of viability. Breeding bird surveys show a significant increase in pileated woodpecker populations in Oregon from 1996-2013 (Sauer et al. 2014)⁴.

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iii.c) What is the trend in elk habitat condition and elk hunting levels and success?

Indicator 1. Changes in elk harvest, success rates, and ODFW elk populations estimates by State Game Management Unit.

⁴ Sauer, J. R., J. E. Hines, J. E. Fallon, K. L. Pardieck, D. J. Ziolkowski, Jr., and W. A. Link. 2014. The North American Breeding Bird Survey, Results and Analysis 1966-2013. Version 01.30.2015. U. S. Geological Society, Patuxent Wildlife Research Center, Laurel, Maryland.

Three Oregon State Wildlife Management Units (WMUs) overlap on the Willamette National Forest; the Santiam WMU, the McKenzie River WMU, and the Indigo WMU. The Oregon Department of Fish and Wildlife (ODFW) collects yearly elk harvest data for each of these WMUs that include number of hunters, total harvest and hunter success. In addition ODFW conducts post-harvest herd composition counts (e.g., bull/cow and calf/cow ratios) and estimates elk population levels for the WMUs. The estimation of elk populations is not an exact science, however, and is based on a number of general assumptions and some professional judgement.

Updated information on changes in estimated elk numbers was recently received from ODFW for the Santiam WMU as part of their process to review elk management objectives (Nancy Taylor, personal correspondence). The estimated elk population in this WMU was about 4000 in 1990, peaked at about 5000 in 2002, and has since declined to about 3000 currently. Other elk-related trends are based on ODFW information received in 2012 (Chris Yee, personal correspondence) that was reported in the 2011 Forest Monitoring Report. The information indicates that elk harvests and hunter success peaked in the late 1990s in all three WMUs and have declined since then. The professional consensus of the ODFW area managers in 2012, based on minimum known elk numbers, estimates of animals missed during surveys, and the amount of areas lacking counts, is that Santiam, McKenzie River, and Indigo WMUs are each substantially below State Population Management Objectives (Chris Yee, personal correspondence). Limited forage on National Forest lands and a need to reduce elk numbers on private lands to lower damage to reforestation are factors responsible for the lower than desired elk numbers. In some areas, elk and deer have shifted from public lands to private lands which have more young clearcuts.

Indicator 2. Changes in estimated elk forage quality and habitat suitability by Big Game Emphasis Area tracked over time.

A westside elk habitat use model has been developed to map elk habitat suitability on the Willamette National Forest (Rowland et al 2013)⁵. Elk suitability values as seen in Table 5, are determined from several variables including dietary digestible energy (higher digestible energy values, higher predicted elk use), distance from roads open to public access (farther from roads, higher predicted use), % slope (flatter slopes, higher predicted use), and distance to cover/forage edge (closer to edge, higher predicted use). A sub-component of this model is a model, referred to as the elk nutrition model, that predicts Dietary Digestible Energy (DDE)

⁵ Rowland, M. M., J. M. Hafer, B. J. Naylor, P. K. Coe, M. J. Wisdom, J. G. Cook, R. C. Cook, R. M. Nielson, and B. K. Johnson. 2013. User guidelines for application, summary, and interpretation of westside elk nutrition and habitat use models. Draft Version 2.0. USDA Forest Service, Pacific Northwest Research Station, La Grande, Oregon. 67 p.

based on % canopy cover (lower canopy cover, higher DDE), proportion of hardwoods (more hardwoods, higher DDE), and potential vegetation zone (silver fir/mountain hemlock forest types have higher DDE than Western hemlock forests other factors being equal). For this monitoring report, changes in elk forage quality were evaluated by running the elk nutritional model for the years 1986, 1993, and 2012 using Gradient Nearest Neighbor (GNN) data. GNN data are widely used by the Forest Service for large-scale mapping and habitat trend analysis, including for the 20-year Northwest Forest Plan Monitoring (e.g., Davis et al. 2015, 2016)⁶. The years 1986 and 1993 were chosen because they were the years with available GNN data that were closest to Year 1990, the start of the Willamette Forest Plan. Year 2012 was chosen because it was the most recent year with available GNN.

The Willamette Forest Plan divided the Forest into 200 Big Game Emphasis Areas (BGEAs). The BGEAs total 1.79 million acres including private inholdings. The amount of private inholdings is small and it is reasonable to include it in the estimation of elk habitat in the BGEAs.

Table 5. The elk nutritional model (Rowland et al. 2013)⁷ divides elk forage into six classes ranging from poor to excellent

<i>DDE* Class</i>	<i>DDE values</i>
<i>low</i>	<i><2.40</i>
<i>low-marginal</i>	<i>>-2.4 to <2.575</i>
<i>high-marginal</i>	<i>>-2.575 to <2.75</i>
<i>low-good</i>	<i>>-2.75 to <2.825</i>
<i>high-good</i>	<i>>-2.825 to <2.90</i>
<i>excellent</i>	<i>>2.90</i>
<i>*DDE = dietary digestible energy</i>	

The estimated median, 30-percentile and 80-percentile values in DDE for the years 1986, 1993, and 2012 are given in Table 6. DDE values are estimated from 2 sets of equations for

⁶ Davis, R. J., J. L. Ohmann, R. E. Kennedy, W. B. Cohen, M. J. Gregory, Z. Yang, H. M. Roberts, A. N. Gray, and T. A. Spies. 2015. Status and trends of late-successional and old-growth forests. Gen. Tech. Rep. PNW-GTR-911. USDA Forest Service, Portland, Oregon. 112 p.

Davis, R. J., B. Hollen, J. Hobson, J. E. Gower, and D. Keenum. 2016. Status and trends of northern spotted owls. Gen. Tech. Rep. PNW-GTR-929. USDA Forest Service, Portland, Oregon. 54 p.

⁷ Rowland, M. M., J. M. Hafer, B. J. Naylor, P. K. Coe, M. J. Wisdom, J. G. Cook, R. C. Cook, R. M. Nielson, and B. K. Johnson. 2013. User guidelines for application, summary, and interpretation of westside elk nutrition and habitat use models. Draft Version 2.0. USDA Forest Service, Pacific Northwest Research Station, La Grande, Oregon. 67 p.

the dominant potential vegetation types in Oregon and Washington (Douglas-fir/Western hemlock-Springfield area or Pacific silver fir/Mountain hemlock), % canopy cover, and proportion of hardwoods (Rowland et al. 2013). The values are very general in that they do not account for the different plant association within the potential vegetation type, but the model is useful in showing broad changes in nutritional forage values when calculated over large areas like a watershed or Forest. Within the Douglas-fir/western hemlock forest, the model predicts poor nutrition forage values at high canopy cover and low hardwood abundance (e.g., >60% cover and no hardwoods; >75% cover and >20% hardwoods). Using the Westside nutrition model, Douglas-fir/western hemlock forests never reach “good” nutritional quality (i.e., DDE >2.75 kcal/g), but can reach the high-marginal forage class at low canopy cover (e.g., <20% cover and no hardwoods; <30% cover and >20% hardwoods).

Table 6. Median, 30-percentile, and 80-percentile elk DDE values for 1986, 1993, and 2012, Willamette National Forest.*

Year	Rank	DDE	DDE Category
1986	30-percentile	2.407	low-marginal
1986	Median	2.476	low-marginal
1986	80-percentile	2.580	high-marginal
1993	30-percentile	2.406	low-marginal
1993	Median	2.475	low-marginal
1993	80-percentile	2.578	high-marginal
2012	30-percentile	2.397	poor
2012	Median	2.466	low-marginal
2012	80-percentile	2.571	low-marginal
*Medians and percentile estimated at the forest-wide pixel scale.			

The silver fir/mountain hemlock series is about a forage class higher than Douglas-fir/western hemlock under similar canopy cover and hardwood percentages. Dense stands lacking hardwoods are predicted to be marginal for elk nutrition. Good forage values occur in stands with moderate canopy and increasing hardwood abundance (e.g., <30% cover and no hardwoods; <50% cover and >20% hardwoods). Excellent forage nutrition is predicted to occur in open stands, typically early seral forests (e.g., 0% canopy cover with no hardwoods; <20% cover and 20% hardwoods).

The percent of the Forest in each forage category is shown below for years 1986, 1993, and 2012 (Table 7). The breakdown in forage values forest-wide for 1986 and 1993 are very similar so 1993 is used for comparisons to 2012 in the remainder of this report. The most

common habitat on the Willamette NF is Douglas-fir/western hemlock forests and the median elk nutritional forage condition was low-marginal for both 1993 and 2012. However, during the period 1993 to 2012, there was a roughly 50,000 acre net increase in the amount of poor quality forage areas forest-wide and a decrease in all other elk forage categories (Table 8).

Table 7. Elk Forage Class Distribution, Willamette National Forest by Year

DDE Class	% of Forested Land by Year		
	1986	1993	2012
1 - Poor	27.9	28.1	31.0
2 - Low Marginal	50.6	50.9	50.2
3 - High Marginal	13.8	13.8	12.6
4 - Low Good	1.9	1.9	1.3
5 - High Good	1.5	1.5	1.3
6 - Excellent	4.1	3.8	3.6

Table 8. Changes in Elk Forage Class Distributions 1993 to 2012, Willamette National Forest by Year

DDE Class	Change in % of Forest	Relative % Change	Change in Acres
1 - Poor	2.9	10.2	49,574
2 - Low Marginal	-0.7	-1.4	-12,107
3 - High Marginal	-1.2	-9.0	-21,482
4/5 -Good	-0.8	-23.5	-13,878
6 - Excellent	-0.2	-5.0	-3,265

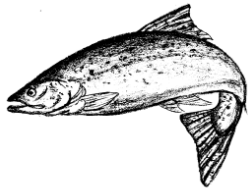
Cook et al. (2004)⁸ found that increased summer forage quality (DDE) improved elk reproduction and survival. In 1993, about 7.2% of the Forest was good or excellent forage. By 2012, this had declined to 6.2%, a decrease of about 17,100 acres. However, the average net decline is somewhat misleading because several wildfires created large areas of good to excellent forage, while the amount of higher quality forage declined across much of the rest of Forest. Overall, 157 BGEAs (78%) had a decline in acres of good to excellent forage, while 34 (17%) had an increase. Fifty percent above the 1993 forest-wide average was selected as a benchmark for areas with relatively large amounts of high-quality elk forage (i.e. BGEAs with >10.5% in good to excellent forage class). In 1993, 50 (25%) of the BGEAs, exceeded this threshold. By 2012, only 19 (9.5%) BGEAs exceeded the threshold. In

⁸ Cook, J. G., B. K. Johnson, R. C. Cook, R. A. Riggs, T. Delcurto, L. D. Bryant, and L. L. Irwin. 2004. Effects of summer-autumn nutrition and parturition date on reproduction and survival of elk. *Wildlife Monograph* 155: 1-65.

tracking the individual BGEAs, 40 of the original 50 in 1993 declined below the threshold level by 2012, while 9 new BGEAS were added due to fires.

Much of the forage created by large fires may not be available to elk because of the lack of proximity to security cover (Rowland et al. 2013). General disturbance from traffic on open roads can also negatively affect elk use in high severity burned areas where cover is lacking, although that is less of an issue here because many of the recent large fires on the Willamette NF have occurred in wilderness or other areas with no or few roads. Due to time constraints we did not run the full west-side model to explore the relationship to cover and open roads for this report, however it would be helpful to do this in future monitoring reports. Because much of the decline in forage values are related to past clearcuts **regenerating to dense-canopy forests**, and few new clearcuts are being added, elk and deer forage values will likely continue to decline in many BGEAs. Running the forage model at the start of the Willamette Forest Plan is useful in creating a benchmark for conditions in the BGEAs at a time when big game populations and hunter success rates were higher than today.

Fish Populations



iii.d) Are S&G maintaining or improving focal fish species populations?

The Willamette National Forest has a limited population monitoring program for fish species. Determining trends of fish populations is under the jurisdiction of the National Marine Fisheries Service, US Fish and Wildlife Service, and the Oregon Department of Fish and Wildlife. There are five year status reviews available for numerous fish species at each of the agency's respective websites and are readily available for public viewing. In general, most species occurring on the Forest are classified as stable with the exception of the Oregon Chub has been increasing and was delisted from the Endangered Species Act in 2015.

Relative abundance surveys were conducted in tandem with stream surveys on approximately 20 miles of stream in 2014/2015. These surveys typically inform in-stream restoration project prioritization and design. While these surveys are informative, they do not allow for population analysis because they are performed only a single time. In 2014, these surveys were conducted on the Detroit District and in 2015 the surveys were conducted on McKenzie River District.

Standards and Guidelines directing road system upgrades have a major potential to affect focal fish species populations. Historic road building practices resulted in barriers to fish migration that resulted in isolated populations or localized extirpation. The Willamette

National Forest is currently making significant financial investments to improve the road system by removing barriers, up-sizing stream crossings, reducing sediment delivery, and removing or storing unneeded roads to benefit aquatic species (ie. Rainbow and Cutthroat Trout). In 2014/2015, approximately 300 miles of road across the Forest underwent road maintenance to reduce sedimentation and improve water quality. Approximately 32 miles of road were put into storage or hydrologically stabilized. This included removal of fish bearing stream crossings that were an impediment to resident fish migration. A new regional database has been developed to better track changes in fish distribution over time as a result of barrier removal.

Aquatic restoration projects have also improved fish populations on a local scale. Habitat improvement projects were conducted on 283 miles of in the 2014/2015 monitoring period. These include miles of stream improved due to road upgrades/renovation, aquatic organism passage, in-stream restoration, road decommissioning, and road storage projects. Annual (repetitive) relative abundance surveys were conducted on a project-specific basis to monitor fish response as a result of the aquatic habitat improvement projects. Second and third year post project surveys were conducted on Soda Fork Creek and Canyon Creek, respectively, in 2014 and 2015. As an example, in 2011 a single Rainbow Trout was found during a presence/absence survey of the restoration project area in Canyon Creek. Three years post implementation, Canyon Creek now has several hundred fish per mile of varying size classes and species.

Anecdotal evidence collected by the Forest shows that restoration efforts are improving habitat and abundance of both focal and T&E species at a local level. The difficulty is determining if those are “new” fish or fish that simply relocated to better habitat. Either way, the restoration projects are providing much needed habitat and the abundance and diversity at these local sites is improving.

Threatened and Endangered Species

The Forest Standards and Guidelines provide direction to protect and restore habitat of threatened and endangered species

(iv) **The status of a select set of the ecological conditions required under §219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern.**

Table 9: Monitoring sub-questions addressing T&E species.

	Monitoring Question	Indicator(s)	Monitoring Results
<i>T&E Fish</i>	<i>iv.a.</i> Are S&Gs maintaining or improving ecological conditions for T&E fish populations?	Population of spring Chinook salmon, bull trout, and winter steelhead.	Results OK
<i>Spotted Owl</i>	<i>iv.b.</i> What is the trend for mature and late successional habitat needed for Northern spotted owl persistence?	Habitat conditions over time for spotted owl.	Habitat trends consistent with NWFP. Large increase in marginal habitat as past harvest recovers.
	<i>iv.c.</i> What is the trend for the Northern spotted owl population?	Estimated number of territorial owls and annual rate of population change.	Populations continues to decline.
<i>Spotted Frog</i>	<i>iv.d.</i> What is the trend for Oregon spotted frog populations on the Forest?	Changes in numbers of breeding Oregon spotted frogs tracked over time	Further monitoring needed.
<i>Botanical Species</i>	<i>iv.e</i> What are the trends for botanical Sensitive Species? Are any species we are monitoring in decline? If so, have management actions been taken to restore their habitats?	Changes in numbers of individuals monitored in selected populations over time.	Results OK

Threatened and Endangered Fish



iv.a) Are Standards and Guidelines maintaining or improving ecological conditions for T&E fish populations?

The Forest conducts presence/absence surveys for fish species to determine distribution across the Forest. These surveys are typically conducted in tandem with vegetation management projects and inform NEPA analyses. In 2014/2015, the Forest conducted approximately five miles of presence absence surveys. No decrease in the extent of fish distribution was identified.

In 2015, the Forest began conducting surveys to identify lamprey species and to map their distribution. During these presence/absence surveys, genetic material was collected to identify the species of lamprey found and to develop genetic markers that can be used for future identifications. Sampling was conducted on all four Districts and genetic identification is currently underway.

Spotted Owl



iv.b) What is the trend for mature and late successional habitat needed for Northern spotted owl persistence?

Indicator 1. *Acres of dispersal habitat, suitable habitat, and by old growth site index categories on the Forest tracked over time.*

This question was addressed by summarizing information on spotted owl habitat trends provided in the recent 20-year Northwest Forest Plan monitoring report at the range-wide and physiographic province scales and by accessing trends at the Forest scale using owl habitat information provided by the lead author of that report.

Davis et al. (2016)⁹ conducted Northwest Forest Plan monitoring to show trends in northern spotted owl habitat over the first 20 years of implementation from 1994 to 2013. They found a range-wide net decrease of 1.5% in northern spotted owl nesting/roosting habitat on federal lands from 9,089,700 acres in 1993 to 8,954,000 in 2013. Gross losses on federal lands were 473,000 acres from wildfires (-5.2% loss), 116,100 acres from timber harvest (-1.3% loss), and 59,800 acres from insect and diseases (-0.7% loss). Because the gross losses were greater than

⁹ Davis, R.J., B. Hollen, J. Hobson, J. E. Gower, and D. Keenum. 2016. Northwest Forest Plan—the first 20 years (1994–2013): status and trends of northern spotted owl populations and habitats. Gen. Tech. Rep. PNW-GTR-929. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 54 p.

the net losses, it indicates that the process of forest succession is compensating for some of the habitat loss.

Dispersal habitat for northern spotted owls over its entire range increased by 2.2 percent on federal lands, but dispersal capable landscapes decreased by 5 percent due to habitat losses on the surrounding non-federal lands. Large wildfires continue to be the major loss of spotted owl habitat on federal lands and most of these losses occurred within the conservation network of large reserves designed for spotted owl conservation in the Northwest Forest Plan.

Within the Western Cascades of Oregon Province, which includes the Willamette NF, there was a net gain of 27,100 acres of spotted owl nesting/roosting habitat (1.5% increase) on federal lands, despite gross losses of 101,500 acres (-4.3% loss) (Davis et. al. 2016, p. 21). The losses include 34,900 acres due to timber harvest, 63,000 acres due to wild fires, and minor losses due to insects and unspecified causes. Forest succession compensated for the loss of nesting/roosting habitat on federal lands in this province.

Within the Western Cascades of Oregon, there was a net gain of 122,200 acres of spotted owl dispersal habitat (3.4% increase) on federal lands, despite gross losses of 121,500 acres (-3.7% loss) (Davis et. al. 2016, p. 31). The losses of dispersal habitat include 28,300 acres due to timber harvest, 89,300 acres due to wild fires, and minor losses due to insects and unspecified causes. Recruitment of dispersal habitat on federal lands in the Western Cascades of Oregon is more than compensating for habitat losses, with the recruitment rate about twice the rate of dispersal habitat loss.

An analysis of dispersal-capable landscapes found no loss of landscape connectivity in the interior of federal lands within the Western Cascades of Oregon (Davis et al. 2016: Figure 9-p.33). There has been no loss in landscape connectivity for spotted owls in a wide corridor through the Cascade Range from the Canadian border south into northern California. However, loss to dispersal capable areas has occurred across a connection area between the Oregon Coast and Cascades Range south of the Willamette Valley. There also has been some areas of dispersal-capable landscape loss and a few small areas of gain along the eastern edge of the range of spotted owl in the east side Cascades area in the northern half of Oregon. What this means for the Willamette NF is that barriers to spotted owl movement have not been identified within the Forest, but potential barriers to owl movement occur to the west of the Forest adjacent to the Willamette Valley and to the east of the Forest in the area of the B&B Fire on the Deschutes NF (Davis et al. 2016: Figure 9-p.33).

At the Forest level, there has been more than a 20% increase (about 82,260 acres) in “marginal” (e.g., dispersal) spotted owl habitat from 1990 to 2012 (Table 1). During this same time interval, there was a net loss of 73,750 acres of unsuitable habitat. The net loss is unsuitable habitat is a result of past clearcuts regenerating into marginal owl habitat. There was also a small (1.2% gain) in suitable habitat during the first 22 years of the Willamette Forest Plan. Suitable habitat is generally foraging habitat that does not provide much old

forest structure for nesting. The gain in suitable habitat was due to a combination of older marginal habitat that developed into suitable habitat, as well as highly-suitable habitat that was impacted by fire, logging or other causes and downgraded to suitable habitat.

Table 10: Changes in Northern Spotted Owl Habitat on Federal Lands on the Willamette National Forest (1990-2012).*

Owl Habitat	Acres			% Change
	1990	2012	Net Change	
HIGH-SUITABLE	623,534	612,042	-11,492	1.8% decrease
SUITABLE	236,275	239,256	2,981	1.3% increase
MARGINAL	375,448	457,707	82,259	21.9% increase
UNSUITABLE	373,247	299,500	-73,748	19.8% decrease

* Data Source: Ray Davis, Leader of Northwest Forest Plan Interagency Monitoring Program, USFS, Pacific Northwest Region, Corvallis, Oregon.

There was a 1.8% (11,490 acres) loss of highly-suitable spotted owl habitat on the Willamette National Forest from 1990-2012. Causes for the loss were not specifically identified at the Forest level, but follow the general factors discussed for losses of nesting/roosting habitat on federal lands in the Western Oregon Cascades physiographic province in the 20-year Northwest Forest Plan monitoring report (Davis et al 2016: Table 6). Wildfires, followed by timber harvest, are the main disturbance factors leading to this habitat loss with a minor amount of loss attributed to insects and other factors. Tiering to discussion in the 20-year Northwest Forest Plan monitoring report (Davis et al 2016: p. 34-38), the loss of highly-suitable habitat on the Willamette National does not exceed losses expected under the Northwest Forest Plan which projected spotted owl nesting/roosting habitat to continue to decline until about 2044 and projected a range-wide 5% per decade loss of owl habitat on federal lands due to fire and logging.



iv.c) What is the trend for the Northern spotted owl population?

The trend for northern spotted owl populations on the Willamette National Forest was estimated from the trend in H.J. Andrews Demographic (HJA) Study Area (Dugger et al 2016)¹⁰. The HJA Study Area covers roughly a quarter of the spotted owl habitat on the Willamette NF. It is one of 11 study

¹⁰ Dugger, K. M., and 37 others. 2016. The effects of habitat, climate, and barred owls on long-term demography of northern spotted owls. *The Condor: Ornithological Applications* 118: 57-116.

areas across the range of the northern spotted owl used to estimate range-wide population changes and has been monitored annually for spotted owls beginning in 1987.

Range-wide it is estimated that the northern spotted owl has declined at a rate of 3.8% a year from 1985 to 2013 (Dugger et al 2016). The HJA Study Area is similar to the observed range-wide decline with an annual observed decline of 3.5% year. The rate of decline for spotted owls appears to be increasing as it was estimated at 2.3% for the HJA Study Area for the period 1992-2006 (Forsman et al. 2011)¹¹.

The percent of owl territories occupied by a pair of spotted owls in the HJA Study Area has declined steadily since the beginning of the Willamette Forest Plan. In 1990, about 80% of spotted owl territories were occupied by a pair (Dugger et al 2015: Figure 1, p. 5)¹². By 2005, that percentage had declined to about 50%. By 2015 only 26% of the territories had pair occupancy (op. cit.).

Increasing numbers of barred owls and habitat loss are believed to be factors at least partially responsible for the decline in northern spotted owls (Forsman et al. 2011, Dugger et al. 2016). In the HJA Study Area, in 2015 single barred owls and barred owl pairs were detected in about 30% and 20%, respectively, of the spotted owl historical territories (Dugger et al 2015: Figure 7, p. 25). In 2005, those percentages were about 20% and 10%, respectively, while in 1990 barred owls were found on less than 5% of the spotted owl territories (op cit.).

Spotted Frog



iv.d) What is the trend for Oregon spotted frog populations on the Forest?

The Oregon spotted frog (*Rana pretiosa*) was listed as federally threatened in 2014 (USFWS 2014)¹³ and final critical habitat was

¹¹ Forsman, E. D., and 26 others. 2011. Population demography of northern spotted owls. *Studies in Avian Biology* No. 40. Cooper Ornithological Society, University of California Press, Berkeley, CA.

¹² Dugger, K., S. Ackers, R. Claremont, K. Crawford, R. Leach, K. Skybak, and C. Steele. 2015. The demography of northern spotted owls (*Strix occidentalis caurina*) on the Willamette National Forest, Oregon. Annual Report FY 2015, 29 December 2015. Department of Fisheries and Wildlife, Oregon State University, Corvallis, Oregon. 52 p.

¹³ USFWS (U.S. Fish and Wildlife Service). 2014. Endangered and Threatened Wildlife and Plants: Threatened Status for the Oregon Spotted Frog: Final Rule. Federal Register Vol 79, No. 168, Friday, August 29, 2014, Rules and Regulations, Pp. 51658-51710.

designated for the species in 2016 (USFWS 2016)¹⁴. There are three known populations of Oregon spotted frog on the Willamette NF, one by Gold Lake on the Middle Fork Ranger District and two in the Mink Lake Basin of the Three Sisters Wilderness on the McKenzie River Ranger District (USFWS 2016). These three populations represent the remaining range of Oregon spotted frog west of the Cascade Crest in Oregon. No new populations have been detected on the Willamette NF in recent years despite survey efforts and it is thought very unlikely that any new undiscovered populations of this species occur on the Forest. The designated critical habitat represents the known occupied habitat areas on the Forest.

The status of population monitoring is presented below.

Gold Lake area:

The Gold Lake population occupies about 292 acres of habitat. Spring egg mass counts have been used to monitor the population (Table 1) which provide a minimum adult population estimate. Surveys have been conducted in 2006, 2007, 2012, and 2015. The counts show that this is a relatively large population (USFWS 2014), but estimated minimum frog numbers have declined steadily since the counts began (Table 1). Sampling variability may explain the observed decline and the latest population estimate still indicates a relatively large population. The Willamette NF plans to continue to monitor this population annually if funding is available to see if the counts begin to stabilize or increase or if the decline in numbers is a real trend.

Table 11. Egg mass counts and estimated minimum adult numbers of Oregon spotted frog at Gold Lake area.

Year	Egg Masses	Minimum No. Adults	Source
2006	860	1720	USGS*
2007	729	1458	USGS*
2012	473	946	Forest Service**
2015	425	850	Forest Service**
Chris Pearl, U. S. Geological Society, Corvallis, Oregon, personal communication. **Unpublished wildlife survey data, Willamette National Forest, Middle Fork Ranger District.			

Mink Lake area:

There are two breeding populations of Oregon spotted frog in the Mink Lake Basin, one in an unnamed marsh (referred to as Unnamed Marsh Mud Lake in the final critical habitat rule) and one at Penn Lake. These sites are about 0.93 miles apart (USFWS 2014; p. 51666). A few

¹⁴ USFWS (U.S. Fish and Wildlife Service). 2016. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Oregon Spotted Frog; Final Rule. Federal Register Vol 81, No. 91, Wednesday, May 11, 2016, Rules and Regulations, pp. 29336-29396.

adults have also been detected in some years at sites within 260-800 meters of the Penn Lake breeding sites, but no permanent breeding has been found at these satellite sites. Critical habitat totals 98 acres and includes the two breeding sites, five satellite lakes, ponds and marshes, and the portion of the South Fork McKenzie River connecting Unnamed Marsh Mud Lake and Beaver Marsh (one of the satellite sites near Penn Lake) (USFWS 2016)¹⁵.

Oregon spotted frog populations have been monitored at the two breeding sites by U. S. Geological Survey using mark-recapture techniques since 2007 but the data have not been rigorously analyzed for trends. In 2011, the breeding adult population was estimated at 179 (with a 95% confidence interval of 146-238) at Penn Lake and at 38 (with a 95% confidence interval of 35-49) at Unnamed Marsh Mud Lake (Adams et al. 2011)¹⁶. The status of the populations is officially listed as unknown at both sites. The Forest Service is currently working with USGS to support continued monitoring of these populations and the expectation is that USGS will analyze the data set for population trends at some future date after more years of data have been collected.

Botanical Species



iv.e) What are the trends for botanical Sensitive Species? Are any species we are monitoring in decline? If so, have management actions been taken to restore their habitats?

Each District averages 5 days of sensitive plant monitoring per year. Most of the sensitive plant populations we have been able to monitor have been stable. However, some are experiencing natural or manmade activities that put them at risk.

We completed a couple of habitat enhancement projects for populations at risk on Sweet Home District. In 2014 we removed vegetation to increase sunlight to the ground for *Lycopodium complanatum*. In 2015 we pruned competing, shading vegetation at an *Ophioglossum pusillum* site and we worked with Portland State University to plant *Arabis*

¹⁵ USFWS (U.S. Fish and Wildlife Service). 2016. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Oregon Spotted Frog; Final Rule. Federal Register Vol 81, No. 91, Wednesday, May 11, 2016, Rules and Regulations, pp. 29336-29396.

¹⁶ Adams, M. J., R. Bury, C. A. Pearl, S. Galvan, N. Chelgren, B. McCreary, and D. Pilliod. 2011. Amphibian Research and Monitoring Initiative: Pacific Northwest Region 2011 Annual Report. USGS Forest and Rangeland Ecosystem Science Center, Corvallis, Oregon. 25 p.

hastatula seedlings at Iron Mountain lookout where the population had been extirpated during lookout removal. Seedling survival is estimated at 40-50%.

There are other species at the southern edge of their range, such as *Botrychium montanum* and *Botrychium minganense* whose populations are in decline. *Ophioglossum pusillum* populations also seem to be in decline across the forest. Experts haven't developed any ideas on how to stop the decline. We will continue to monitor these populations as funding allows.

Recreation and Cultural Resources

Recreation on national forests is a major contribution to social, cultural, and economic conditions. This section monitors changes in the recreation experiences the Forest provides and an opportunity to see trends. The Forest strives to provide sustainable recreation opportunities and access for a range of uses which would add to the social and economic health of communities.

Benefits from other areas such as the cultural resources provide a more indirect benefit designed to assist the Forest Supervisor in determining the effectiveness of the Forest Plan Standards and Guidelines in providing protection to these sites.

(v) The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.

Table 12: Monitoring sub-questions addressing recreation and cultural resources.

	Monitoring Question	Indicator(s)	Monitoring Results
<i>Historic Properties</i>	<i>v.a.</i> Are significant (National Register eligible) historic properties being maintained, stabilized, and repaired according to historic preservation standards?	Monitoring data/site condition assessments.	Results OK
<i>Visitor Satisfaction</i>	<i>v.b.</i> Are people having a high level of satisfaction during their visit to Willamette National Forest?	Percent visitor satisfaction for (1) developed sites (2) general forest areas (3) designated wilderness	Results OK

Cultural Resources



v.a) Are significant (National Register eligible) historic properties being maintained, stabilized, and repaired according to historic preservation standards?

The Forest cultural resource inventory included 3920 recorded cultural resources, at the end of fiscal year 2015, 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 strives to manage and protect these historic properties 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.

During the two year period covered by this report, fiscal years 2014 and 2015, almost 5000 acres were reported surveyed for cultural resource through the database of record. Seventy 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 Section 106 of the National Historic Preservation Act (NHPA), though some were also 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 such options are not feasible, adverse effects would be mitigated through scientific recovery and preservation of the data embodied in the historic property.

During FY 14 and FY 15, Heritage staff reported monitoring visits to 59 sites. These monitoring visits occur most often in conjunction with proposed project surveys or as follow-up to recent projects. Several are designated "Priority Heritage Assets" (PHAs) which are visited on a 5 year cycle for formal condition assessments. Some 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, such as in the Santiam Pass Recreation area and Sand Mt SIA affecting the Santiam Wagon Road as well as fragile volcanic soils. Some incidents unauthorized artifact

collecting were documented, e.g., in areas where low water exposed reservoir area sites. Typically there are some archaeological sites which cannot be relocated for monitoring due to changed environmental conditions, vegetative encroachment, or incomplete information on early site forms. Sites monitored, were often characterized as overgrown with dense vegetation. Effects of weathering and erosion are also commonly noted.

The summer of 2015 saw the regional Rainbow Family gathering visit our forest. Unfortunately, the area they selected coincided with the location of a high elevation meadow complex and a number of previously recorded archaeological sites. The group would not be directed to another area, and their activities resulted in almost 90m³ of disturbance, including latrine trenches, fire pits, kitchen compost pits, trails and water lines. A damage assessment has been initiated, but more funding is needed to evaluate the full impacts to these cultural properties.

Maintenance and management of historic structures continues to be a challenge, with over a hundred such properties and declining facilities funding. Those that are actively used by the Forest are typically maintained according to historic preservation standards. However those that are not actively used are not consistently well maintained and may be subject to vandalism and deterioration. Significant vandalism has occurred at the fully-restored, recreation rental CCC-era Gold Butte lookout was damage by gun shots and ax hacks in the spring of 2015, repaired by Sand Mt Society volunteers in time for the rental season.

Several examples exist across the Forest of historic preservation through appropriate maintenance and rehabilitation efforts at many important historic sites. For example, for the past 10 years Fish Lake Remount Station, a National Register listed site, has been maintained and restored with assistance from the Friends of Fish Lake group. In FY14, with support from the R1 Preservation Team and a Preserving Oregon grant, we hosted a log structure restoration training for about 40 R6 employees at Independence Prairie Guard Station, another National Register listed site. In addition, several historic lookouts are regularly maintained, stabilized or repaired in partnership with a lookout volunteer group, the Sand Mt Society.

Continuing programs of public outreach and education 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 and Travel Management initiatives.

Consultation with the State Historic Preservation Office (SHPO) continues under the 2004 Programmatic Agreement (PA) for compliance with NHPA. Over the two-year period, 67 projects were reviewed to determine their potential effects to historic properties (cultural resources). About half of these were exempt from standard case-by-case NHPA review under

the PA. Standard inventory was conducted for the other 30 NEPA projects. For the most part, these resulted in findings of “Historic Properties Avoided” or “No Historic Properties Affected.” Often mitigation measures and design criteria were applied to ensure protection of historic properties. Consultation with local federally-recognized tribes continues to evolve and relationships grow stronger. 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. In FY 14 alone, 7780 such public contacts were reported.

Some other significant accomplishments & highlights for the reporting period include:

- On-going maintenance, rehabilitation, and restoration at historic sites such as Fish Lake Remount Depot Historic Site and several historic lookouts (Gold Butte, Carpenter, Huckleberry, Sand Mt);
- Volunteer contributions valuing almost \$35,000;
- Restored interpretive signing lost in a wildfire at Slick Creek Cave at Bedrock Campground;
- Completed a new interpretation of the Free Emigrant Road consisting of a traveling display and brochure under a grant from the Oregon Historic Trails commission.
- Conducted Section 110 (non-project inventory) in 35+ acres of wilderness, additional non-project survey was initiated but not yet reported;
- 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;
- Met/Exceeded target for a Heritage Program Managed to Standard, as measured by seven “indicators” through efforts such as those recounted above. More details available upon request.

Recreation

The U.S. Forest Service develops estimates of the volume of recreation use on National Forests through the National Visitor Use Monitoring program. Onsite surveys across the National Forest System is completed every 5 years. The following report reflect 2010-2014.



v.b) Are people having a high level of satisfaction during their visit to Willamette National Forest?

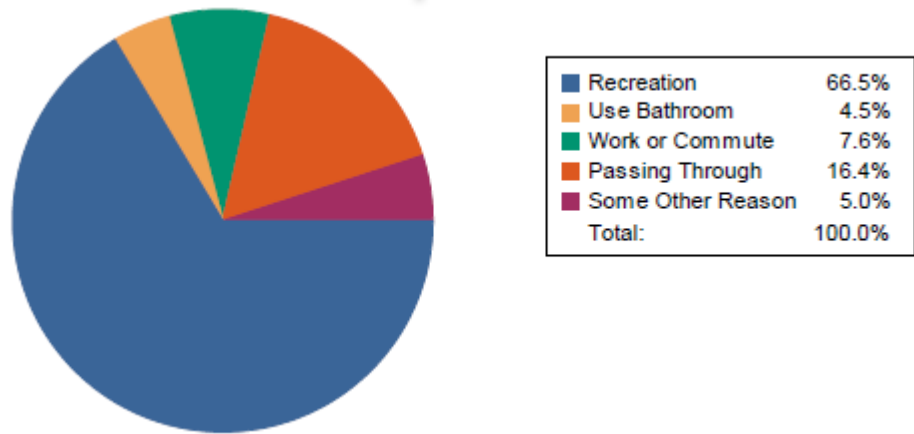
Forest Plan recreation visitor use estimates are now largely based on the periodic National Visitor Use Monitoring program results.

The National Visitor Use Monitoring (NVUM) program provides reliable information about recreation visitors to national forest system managed lands at the national, regional, and forest level. 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.

Purpose of Visit by Visitors Who Agreed to be Interviewed

Visitors were interviewed regardless of whether they were recreating at the site or not, however the interview was discontinued after determining that the reason for visiting the site was not recreation. Chart 1 displays the various reasons visitors gave as their purpose for stopping at the sample site.

Chart 1: Purpose of visits.

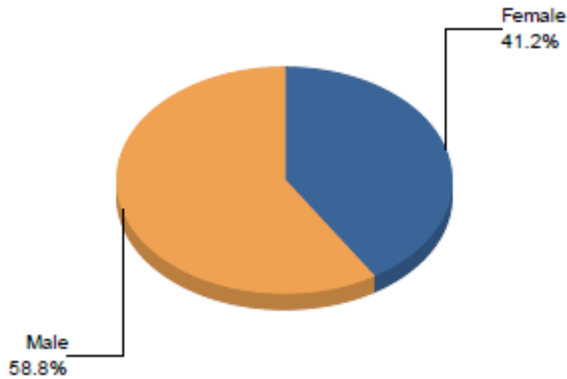


Percent of National Forest Visits* by Gender

Descriptions of forest recreational visits were developed based upon the characteristics of interviewed visitors (respondents) and expanded to the national forest visitor population.

Basic demographic information helps forest managers identify the profile of the visitors they serve. Demographic results show that a little more than 40 percent of visits are made by females.

Chart 2: Visits by gender.



Percent of National Forest Visits* by Age

The age distribution shows that on the Willamette about 16 percent of visits are made by children under 16. However, people over the age of 60 account for about twenty percent of visits.

Table 33: Recreation visits by age class

Age Class	National Forest Visits (%)‡
Under 16	16.3
16-19	2.9
20-29	13.2
30-39	14.1
40-49	15.3
50-59	18.7
60-69	14.5
70+	5.0
Total	100.0

Activities

After identifying their main recreational activity, visitors were asked how many hours they spent participating in that main activity during this national forest visit. Some caution is needed when using this information. Because most national forest visitors participate in several recreation activities during each visit, it is more than likely that other visitors also participated in this activity, but did not identify it as their main activity. For example, on one national forest 63 % of visitors identified viewing wildlife as a recreational activity that they

participated in during this visit, however only 3% identified that activity as their main recreational activity. The information on average hours viewing wildlife is only for the 3% who reported it as a main activity.

The most frequently reported primary activities include hiking/walking (18%), viewing natural features (16%), and fishing (10%). Half or more of all visits report participation in viewing natural features and hiking/walking.

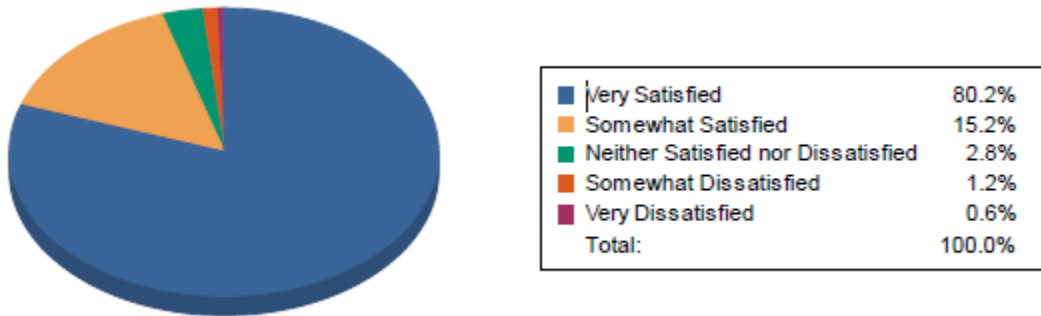
Table 14: Most frequent primary activities.

Activity	% Participation*	% Main Activity‡	Avg Hours Doing Main Activity
Hiking / Walking	56.0	17.6	3.6
Viewing Natural Features	49.7	15.6	2.5
Relaxing	46.3	8.7	26.1
Viewing Wildlife	35.5	2.5	4.4
Driving for Pleasure	28.1	5.0	2.8
Fishing	16.8	9.5	4.1
Developed Camping	15.7	7.4	39.3
Picnicking	14.8	2.8	12.2
Other Non-motorized	11.6	3.2	2.6
Nature Study	11.1	0.4	4.6
Nature Center Activities	8.4	0.1	3.6
Downhill Skiing	6.0	5.5	4.2
Gathering Forest Products	5.8	0.8	2.4
Hunting	5.7	5.0	5.2
Motorized Water Activities	5.7	1.5	6.0
Non-motorized Water	5.6	2.2	6.0
Backpacking	5.3	3.2	22.8
Visiting Historic Sites	5.2	0.1	1.2
Cross-country Skiing	5.0	2.5	3.1
Some Other Activity	4.7	3.2	3.2
Primitive Camping	4.2	1.0	48.1
Bicycling	3.7	0.5	6.2
Resort Use	2.6	0.2	44.7
OHV Use	2.6	1.9	6.0
Motorized Trail Activity	0.9	0.0	6.0
Horseback Riding	0.5	0.2	3.4
Other Motorized Activity	0.3	0.1	3.0
No Activity Reported	0.2	0.2	
Snowmobiling	0.0	0.2	10.0

SATISFACTION

The overall satisfaction results show that about eighty percent of people visiting indicated they were very satisfied with their overall recreation experience. Another fifteen percent were somewhat satisfied. The results for the composite satisfaction indices were mixed. Satisfaction ratings for perception of safety were at least 95% for all types of sites. Satisfaction ratings for access items were above 85 percent for all types of sites. Facility condition and services items in dispersed settings and Wilderness were lower.

Chart 3: Level of satisfaction.



Climate Change

This monitoring report describes the resources and services the Forest provides its constituents. Climate change puts these resources at risk. One urgent hazard to the Forest is expanding insect infestations.

The Forest Service will use a scorecard system to track our progress in responding to climate change. The Climate Change Performance Scorecard will be administered annually to each national forest or grassland. The scorecard will help as the agency moves forward with research and education on climate change issues, adjusting land management strategies accordingly.

(vi) Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area.

Table 15: Monitoring sub-questions addressing climate change and other stressors.

	Monitoring Question	Indicator(s)	Monitoring Results
<i>Climate Change</i>	<i>vi.a.</i> Is the forest reporting and meeting expected adaptations as reported on the National Climate Scorecard?	Timely response to regional data calls. Proactive forest level activities towards adaption.	Results OK
<i>Insect & Disease</i>	<i>vi.b.</i> Is insect and disease below potentially damaging levels?	Acres affected by type and insect and disease.	Results OK

Climate Change



vi.a) Is the forest reporting and meeting expected adaptations as reported on the National Climate Scorecard?

The goal of the scorecard is to create a balanced approach to climate change that includes managing forests that adapt to changing conditions, mitigating climate change, building partnerships across boundaries, and preparing our employees to understand and apply emerging science. Upmost importance is the Willamette remain in sync with the Region in meeting this goal.

The Willamette has consistently met or exceeded the benchmarks outlined in the Climate Scorecard (<https://www.fs.usda.gov/main/r6/climatechange>). We are involved with projects such as floodplain restoration, young stand thinning, and meadow enhancement that all contribute to improved landscape resiliency and resistance to climate change.

Insect and Disease



vi.b) Is insect and disease below potentially damaging levels?

Monitoring of insect and disease activity on the forest is completed each year. There are endemic levels of fir engraver and Douglas-fir bark beetle at levels that are considered to be normal. Within Willamette National Forest 6,590 acres are susceptible to high levels ($\geq 25\%$) of overall tree mortality and 8% of the tree biomass is at risk to forest pests.

Table 16: Modeled Impacts to Host Tree Species

Host Tree Species	Loss, % of Host	Loss, % of All Trees
Whitebark Pine	45%	<1%
Sugar Pine	43%	<1%
Western White Pine	37%	<1%
Lodgepole Pine	19%	<1%
Mountain Hemlock	18%	1%
White Fir	17%	<1%

Host Tree Species	Loss, % of Host	Loss, % of All Trees
Subalpine Fir	17%	<1%
Grand Fir	16%	<1%
Ponderosa Pine	14%	<1%
Douglas-fir	11%	6%
Engelmann Spruce	2%	<1%
Pacific Silver Fir	<1%	<1%

Table 17: Modeled Impacts to Forest Pests

Forest Pest	Loss, % of Host	Loss, % of All Trees
Mountain Pine Beetle	20%	<1%
Laminated Root Rot	11%	7%
White Pine Blister Rust	10%	<1%
Spruce Beetle	2%	<1%
Fir Engraver	2%	<1%
Western Pine Beetle	1%	<1%
Balsam Woolly Adelgid	1%	<1%
Armillaria Root Disease	<1%	<1%
Douglas-fir Beetle	<1%	<1%
Western Spruce Budworm	<1%	<1%
ALL FOREST PESTS		8%

A map and report of insect and disease activity is available [here](#).

Meeting Desired Conditions and Objectives

The Forest Standards and Guidelines provide direction to enable the Forest to meet the goals of maintaining and improving water quality, providing a sustainable timber output, while minimizing catastrophic wildfire.

(vii) Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities.

Table 15: Monitoring sub-questions on desired conditions and objectives.

	Monitoring Question	Indicator(s)	Monitoring Results
<i>Fuels</i>	<i>vii.a.</i> Are mgmt. activity-created fuels at acceptable ranges for downed woody material as indicated in Table IV-32, on 95% of the affected acres?	Tons/acre of activity-created dead woody material in activity units.	Results OK
<i>Timber Output</i>	<i>vii.b.</i> How do the timber output estimates in the Forest Plan compare with actual production?	How does the timber volume sold compare to the probable sale quantity (PSQ)?	Results OK
<i>Stocking</i>	<i>vii.c.</i> Are we meeting the recommended stocking levels and timeframes required by National Forest Management Act (NFMA)?	Meeting stocking guidelines in Forest Plan as tiered to Forest Service Handbook.	Results OK
<i>Sustainability</i>	<i>vii.d.</i> How ecologically sustainable is the level of timber harvest on the forest?	What is the amount harvested timber each year compared to the amount of growth and mortality across the forest?	Results OK

Post Management Fuel Level



vii.a) Are management activity-created fuels at or below the maximum acceptable ranges for allowable downed woody material as indicated in Table IV-321, on 95% of the affected acres?

Table 16: Acres of Activity Generated Fuels meeting Standards and Guidelines

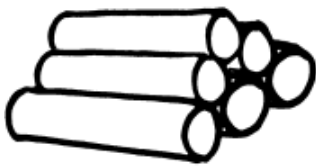
Acres of Activity Generated Fuels (2015)	Acres of Treated Fuels (2015)	Percentage of Acres meeting S&G FW-252 (2015)	Acres of Activity Generated Fuels (2013-2015)	Cumulative Annual Avg. Treated Fuels (2013-2015)	Percentage of Annual Acres meeting S&G FW-252 (2013-2015)
3,164 acres	3,044 acres	96%	9,369 Acres	3,123 acres	96%

Preliminary Interpretation of Results: For FY 2015 there are 3,164 acres of harvest activity fuels were created for 120 acres out of the 3,164 received a fuels treatment such that the down woody material remaining in the units were at or below the Standards and Guidelines (S&Gs) found in Forest Wide table 252. The 120 acres not meeting the S&Gs in table FW-252 were associated with helicopter logged units not receiving a fuels treatments. Fuels treatments were cost prohibitive and tonnages of down woody material were knowingly in exceedance of S&Gs in order to meet other forest objectives.

Information Sources: Information gathered for this Forest fuels monitoring report was consolidated from the Willamette National Forest fuels AFMO’s fuels monitoring reports. AMFO’s completed photo series ocular estimates for post-harvest fuel loading-

Threshold of Variability: The threshold of variability was not exceeded in fiscal year 2015 and the three years cumulative average has not been exceeded.

Timber Output



vii.b) How do the timber output estimates in the Forest Plan compare with actual production?

Target accomplishment is measured in terms of volume awarded. In FY14 and FY15 the Willamette NF assigned target was ranged from 75 to 80 mmbf. Total volume awarded through timber sales,

permits and contract modifications was 80.2 mmbf. Total volume offered in FY15 using a timber sale contract was 76.7 mmbf. Total volume offered and total volume awarded amounts are all included in meeting our PSQ (111 mmbf) levels. FY'14 offer amounted to 72% of the PSQ with FY15 award being 69% of PSQ.

The total volume cut from year to year is more influenced by the market prices for lumber. The total 96.4 mmbf volume was cut in FY14 on the forest and 111.2 mmbf was cut in FY15.

The majority of the timber harvesting program in the past few years, including FY14 and FY15 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.

Stocking Levels



vii.c) Are we meeting the recommended stocking levels and timeframes required by National Forest Management Act (NFMA)?

The National Forest Management Act (NFMA) establishes the policy of the Congress that all forested lands in the National Forest System be maintained in appropriate forest cover with species of trees, degree of stocking, rate of growth and stand conditions designed to secure the maximum benefits of multiple use sustained yield management in accordance with land management plans.

Certified silviculturists approve all vegetation management prescriptions on the Forest to ensure the Willamette National Forest remains in appropriate forest cover. In situations where a disturbance, either from fire or harvest, creates a condition where stocking levels drop below the minimum required amount specified in the Forest Plan, reforestation plans are prepared. Reforestation can be natural or planted and is monitored through stocking surveys up to five years after seedling establishment. The stand is certified after the final stocking surveys demonstrates the regeneration on the site is fully stocked.

Over the course of 2014 and 2015 there were 637 acres were certified as adequately stocked under the expectations of the NFMA law. From this total, 263 acres were monitored from

natural regeneration and 374 acres were monitored after planting. Causal agents were both fire and timber harvest.

Sustainable harvest



vii.d) How ecologically sustainable is the level of timber harvest on the forest?

This chart shows we harvest 104.6 mmbf in 2015, lost 422.7 mmbf, and after subtracting harvest and natural mortality, grew 767mmbf.

Table 17: Compares growth to harvest and mortality.

Million board feet (Int'l rule)

Change	Timberland		Other forest		All forest	
	Total	SE	Total	SE	Total	SE
Gross growth	1,004.4	47.3	289.8	45.4	1,294.2	64.4
Mortality	303.5	43.3	119.2	42.3	422.7	60.3
Net growth	700.9	66.6	170.6	64.4	871.6	92.4
Removals	104.6	38.5	0.0	0.0	104.6	38.5
Net change:	596.3		170.6		766.9	
Volume at time 2	60,328.6	2,644.3	21,984.8	3,232.7	82,313.4	4,118.2
Area (ac):	1,187,548	17,855	416,305	22,540	1,603,853	23,645

Land Productivity

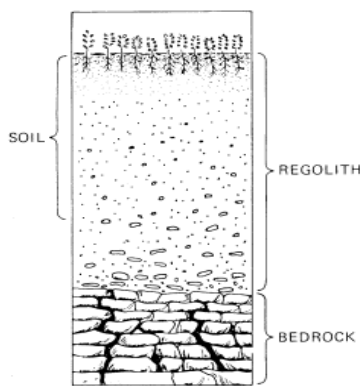
The Forest Standards and Guidelines provide direction to enable the Forest to meet the goals of maintaining and improving water quality, providing a sustainable timber output, while minimizing catastrophic wildfire the effects to resources.

(viii) The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 U.S.C. 1604(g)(3)(C)).

Table 17: Monitoring sub-questions on the productivity of the land.

	Monitoring Question	Indicator(s)	Monitoring Results
<i>Productivity</i>	<i>viii.a.</i> Are management activities being implemented so that they do not substantially and permanently affect soil conditions?	% of soils in disturbed condition at the unit and project scale.	Results OK

Soil Conditions



viii.a) Are management activities being implemented so that they do not substantially and permanently affect soil conditions?

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

Shed Thin, Sten Thin, Fork Thin, South Pyramid Thin, Dome Thin, Cougar Thin, Shore Nuf Thin, and Leftover 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 15,600 feet in 14 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 6 to 16% (average 9%) of surveyed ground-based logging areas having compacted 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 Dome Thin Timber Sale and recommended an additional 3-4 acres of subsoiling above and beyond NEPA prescriptions for soils to alleviate ground-based caused compaction.

The Forest Geologist also conducted post-prescribed fire monitoring of soils after under burns in the Fork Thin, BT2 Thin, Pryor and Downing 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 Fork Thin Timber Sale unit 3, duff retention standards were 20-40% and prescribed burning left well over 90% duff retention with no signs of detrimental burning observed. Units of BT2, Pryor and Downing Timber Sales had various duff retention standards ranging from 10-80%, based on the soil types in each unit, and standards for duff retention and limiting detrimental soil impacts were met in all six units surveyed. 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.

Implementation Monitoring

While implementation monitoring is not part of the new monitoring questions resulting from the 2012 Planning Rule, the Willamette National Forest is committed to implementation monitoring and was Monitoring Question 1 in the 1989 Forest Plan Monitoring Strategy.

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 2014 and 2015 to focus specifically on compliance with the Forest Plan.

Table 18: Projects monitored in 2014 and 2015

Ranger District	Activity Monitored 2014	Activity Monitored 2015
<i>Detroit</i>	Cancelled due to Bingham Ridge Fire Complex	Sugar Pine Project
<i>Sweet Home</i>	3 Projects	Smith Thin from 2009 Park Smith Thin EA
<i>McKenzie River</i>	Spring Chinook Release Sites Improvements	Kafka Thin Project
<i>Middle Fork</i>	Cancelled due to Deception Fire	OWTFR Timber Sale

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 2014 and 2015. 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.

Forest Supervisor Reviews

Detroit Ranger District 2014

Cancelled due to Bingham Ridge Fire.

Detroit Ranger District 2015 - Sugar Pine Project

Attendees

1. SO Review Team: Jay Anderson, Tracy Beck, Joe Doerr, Tim Lahey, Anita Leach, Shawn Sheldon, Nikki Swanson, Trish Wilson
2. District Participants: Michelle Caviness, Nanci Curtis, Chris Donaldson, Mark Leis, Grady McMahon, Lyn Medley, Jon Meier, Rob Mickey, Chris Wagner, Daryl Whitmore, Jamie Sheahan Alonso
3. Other: Dave Leach (retired district silviculturist); Ross Scrocca (past district timber sale administrator); Cindy Glick (district ranger – SHRD), Ken Loree (operations – SHRD)

Objectives of the Review

1. Were the objectives, standards, guidelines, and management practices specified in the Forest Plan being implemented? “Did we do what we said we were going to do?”
2. Were there lessons learned to improve future projects?
3. What are the vegetation management issues currently faced by the district?

Stop #1 - Overview of Sugar Pine Project

Need for the Project: The project is located near the northern end of the range of sugar pine in the East Humbug drainage on Detroit Ranger District. East Humbug lies in a local rain shadow and has dry, southerly aspects that favor sugar pine. In the last decade about half of the large sugar pine in the area, and many of the younger sugar pine, have died mostly as a result of competition-induced mortality, mountain pine beetle, and white pine blister rust. In addition, years of fire suppression have contributed to the current high fuel loadings in the

project area which increase the likelihood of a stand replacing wildfire here. Also, years of fire suppression have restricted the necessary seed bed needed for sugar pine regeneration.

Purpose of Project: The purpose of the project was to reduce sugar pine mortality from mountain pine beetles; reduce vegetative competition; provide openings for sugar pine regeneration; reduce ground and ladder fuels to lessen the risk of stand replacing fires; and reintroduce fire into the sugar pine ecosystem.

Proposed Action: The proposed action was to treat about 187 acres (8 stands) by either commercial thinning or understory removal or a combination of both. Understory removal was proposed to remove most trees < 11" or 12" DBH. Trees >30" DBH, as well as snags and down wood, were to be retained. The units were planned to be yarded by either ground-based equipment or skyline. Brush and slash were to be treated through YUM yarding, piling and burning within the units, and underburning. Both sugar pine and Douglas-fir were to be planted.

Project Changes: There were a number of personnel changes throughout the life of the project and some of the rationale for project changes was not well documented.

There was a design criteria to leave all residual old growth >30" DBH, except mistletoe-infected western hemlock within 30 feet of sugar pine (those hemlock were proposed to be girdled). There was no provision to allow falling of these large trees to facilitate skyline logging corridors, so a decision was made to helicopter log most of the units.

NEPA was not re-opened to analyze the large landings needed for helicopter operations and the other cascading effects that resulted from the decision to helicopter log. The expense of helicopter logging reduced the available funds for prescribed fuel treatments. Since whips were not felled and brush was not reduced, it was decided not to underburn some units because of the potential to cause unacceptable stand damage because of these ladder fuels. Lack of underburning, or doing some of the other prescribed fuel treatments, resulted in fewer seedbeds for sugar pine regeneration, more vegetative competition with sugar pine, as well as not meeting the objective of reintroducing fire into the sugar pine ecosystem.



Figure 1: Overview of a unit where the burning prescription was changed.

Stop #2 – Slash pile in helicopter landing

The helicopter landing we looked at in stop #2 was small and yarding unmerchantable material (YUM) to the landing resulted in very large slash piles. To keep the landing



Figure 2: Large slash pile at helicopter

operational, it was necessary to keep moving this YUM material into the slash pile. This resulted in a lot of dirt being mixed with the logging slash. An attempt was made to burn this material but the dirt in the pile, combined with the slash being green, resulted in less material being consumed than desired.

A suggestion was made that it might have been better to have an end haul site. Another suggestion was made to plant sugar pine in the landing.



Figure 3: Note the dirt mixed with the slash.

Stop 3: Unit 5

We looked at the implementation of the prescription for Unit 5. There were approximately 25 sugar pine in this stand. The prescription was to leave all sugar pine >12" DBH and cut all trees <30" DBH within 30 feet of those sugar pine. In the portion of the stand not adjacent to sugar pine, the prescription was to thin leaving the best dominant and co-dominant trees to an average basal area of 160 ft² per acre. Based on past experience on previous sales, the unit



Figure 4: Review of a prescription to preserve sugar pine.

was proposed for underburning in the fall. Sugar pine mortality is high if burning was done in the spring.

Unfortunately, the unit didn't get underburned as planned, therefore it did not create seed beds for the sugar pine regeneration and did not meet the objective of re-introduction of fire into the sugar pine ecosystem.

Stop 4: Unit 4

Unit 4 was proposed to be yarded by ground-based equipment but was helicopter logged instead. There were some large sugar pine within the unit, some natural sugar pine regeneration, as well as sugar pine that had been planted.

In this, and several other units, whip falling and brush reduction did not occur. The unit was also to be grapple piled rather than underburned because of the desire to retain existing sugar pine regeneration. Whip falling, brush reduction, and grapple piling would have reduced the slash as well as competition with sugar pine. Grapple piling would have also created more opportunities for planting sugar pine. The planted sugar pine were not currently growing well, likely due to low nutrients and competition from other vegetation.

Stop 5: Highway 46 North - sugar pine restoration

Sugar pine restoration is proposed in the Highway 46 North project. In the unit we looked at, the proposal would be to thin to about 50 trees per acre and place four gaps that are about three acres in size. The unit could be burned in the fall, but since there currently are no sugar pine identified in the unit, a spring burn is possible. It was also proposed that stewardship contracting be used to fall whips.



The Highway 46 North project consists of the following projects:

- Sugar pine restoration
- Hardwood conversion
- Huckleberry enhancement
- Meadow restoration

- Early seral creation
- Timber harvest

Wrap Up Comments

We want to thank the district for hosting this monitoring trip. Also, thank Dave and Ross for coming.

1. The district was commended for its openness in discussing the various changed decisions that occurred on this project and tracking those changes and decisions over time.
2. A diameter limit restricting harvest of trees >30" DBH, with no exceptions for logging feasibility, resulted in changing logging systems from ground-based and skyline systems to helicopter. This also changed the economics of the project and affected the ability to accomplish fuel treatments and other project objectives.
3. Because of various decisions that were made, was disappointed at the way the project turned out. The intent was sugar pine restoration and re-introduction of fire into that ecosystem. We didn't accomplish what we had originally intended to do.
4. It was good to look at a past project and learn from it.
5. There were several transitions in staff over the life of this project. It is important to document changes, especially in light of these transitions.
6. Didn't know about impacts of burning sugar pine in the spring vs. the fall.
7. It is good that we are talking about project faults so we can make the next project better.
8. Integrity, open, honest, candid, commitment. Willamette has a learning culture.
9. If we burn in the fall it is hard to meet 10% exposed soil and 90% down wood.
10. Look at fire suppression differently, more buy in adjacent to wilderness
11. Good field trip
12. Watch out for one liners that can make a big impact on project implementation such as not harvesting >30" DBH trees.
13. Lots of passion for sugar pine, learned from sale, will take that knowledge into a new project
14. Good learning experience.
15. You really do have sugar pine at Detroit! Like the way that we apply what we learned to a new project.
16. Adaptive management, trees planted still alive.
17. Learned a lot from what happened in the past as we move forward

18. Thoughtfulness that went into project changes. Sugar pine push to meet target, don't have time to make changes because had to meet target.
19. Increase risk, early seral creation, harvest >80 year
20. If don't have upper diameter limit could do the right thing for the ground. This is a common theme throughout the region.
21. Work along the highway

Sweet Home Ranger District 2014 – Three Unique Projects

Objectives of the Review

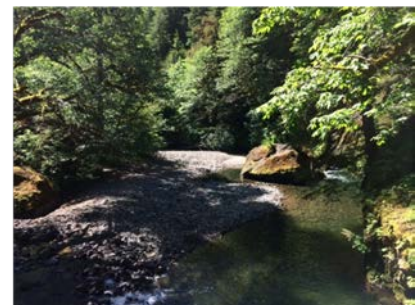
1. Did we do what we said we were going to do? Evaluate the consistency from planning through implementation.
2. Was there lesson’s learned to improve future projects?
3. And new to this year, the FLT is interested in learning what type of public engagement occurred. If you were to do the project today, what would you do differently in terms of public engagement?

1) House Rock Campground Bridge Replacement



- This popular bridge needed to be replaced when the previous one failed two years ago. There was a natural log that people would cross on to get to the popular House Creek Falls, but it was rather precarious. The District wanted to replace it with something longer-lived than a log stringer and began exploring options including steel and pressure treated wood. Recreation and engineering worked seamlessly together on this project.

- The public was outreached through the standard outreach list as well as the hiking community as this is a high profile project. No comments were received.
- The decision was made to use a pressure treated pre-built bridge due to the high costs of steel (savings of about 200k) and the more aesthetic nature of wood. The bridge was built and predrilled off site and then brought in as “kit” to assemble on location. The project cost approximately 100k. The funding was largely comprised of Trails Capital Improvement (CMTL) funding.
- There were concerns about the use of pressure treated wood, but due to the distance to listed fish habitat it was determined that the project could proceed using the programmatic restoration consultation (ARBO II).
- Even though there was no anticipated effect to winter steelhead or spring chinook, there were still concerns about the use of treated wood on other aquatic species. Very little scientific information exists on the use of pre-treated lumber adjacent to streams. Manufactures of treated wood have been working hard to develop products that minimize this risk. In addition,



the Oregon State University School of Forestry conducted monitoring. Results are not back at this time.

- The design constraints for the project were the use of existing abutments and historic rock work and to keep the historic nature of the site. Both objectives were met well.
- Public response to the completed bridge has been very positive.

2) Silver Bough Project

- This program diversifies the forest products sold and is a niche on the Forest and in the Region. In the 90's, the bough sales started as a pilot project on the Willamette and has grown since then.
- Species preferred for bough collection include noble fir, cedar and western white pine. Other species are not as preferred because the needles fall off too soon. The bough



material is noble fir and the best flush (color) for boughs occurs about 3 years after a pre-commercial thinning which generates the highest dollar for the material.

- The silver bough project used a helicopter to remove the bundles from the site. Most of the areas in this sale are on their last lift (collection). Each whorl weighs about 2 pounds and collections are bundled and weigh about 75 pounds.
- For future bough collection availability, because of the plant association, this site would be a good candidate for a regeneration harvest at age 40.
- When asked how contract administration workload compares or conflicts with traditional timber sales, the response was not that much because of the harvest inspectors in the zone. The inspectors visit active sales a few times per week and the window of collection is relatively short. Issues related to increasing the program would be limited personnel, impact to sale administration and availability of sites in the future.
- Public comments have been positive because it is non-ground disturbing. Hunters were either happy about the operation because they felt it “drove” the game and funneled their movement or they were unhappy because the helicopter noise ruined their experience.

3) Soda Fork Tree Tipping

- Public Involvement- Project was part of the Cool Soda All Lands approach.
- Received an OWEB grant to help pay for the project.
- Worked closely with the watershed council for successful implementation of the project.



Bedrock-dominated lower Soda Fork Creek before project implementation

- Watershed Council is made up local stakeholders with a vested interest in watershed health.
- Total project cost was \$116,000, OWEB grant was for \$66,000.
- Original scope of project was reduced based on available funding.
- Fish and wildlife benefits from tree tipping.
- Aquatic benefits include increased gravel beds, structure and diversity.
- Wildlife benefits by creating

“bridges” across streams and benefits to floodplain dependent species.

- 34 trees were strategically tipped along a 0.5 to 0.75 mile stretch of the stream.
- A skidder with a winch was used to tip trees.
- There are three primary steelhead streams on the SH District- Moose, Canyon Creek and Soda Fork. Moose and Canyon Creek have both similar received restoration treatments within the last five years.



Lower Soda Fork Creek after tipping whole trees with root wads into the channel.

- Monitoring results showed spawning redds in the first spring after implementation which was not anticipated and uncommon to see such a rapid response.
- Prior to wood placement stream was scoured to bedrock.
- Great support from the Regional Office “Restoration Assistance Team”.
- Some public comments expressed concern about tipping trees for fish habitat, felt there was greater value in trees standing.
- The design team recognized that concern but felt that there would be important short term benefits listed fish species in a stream that has been historically heavily manipulated.

Sweet Home Ranger District 2015 - Smith Thin from 2009 Park Smith Thin EA

Attendees

1. SO Review Team: Jay Anderson, Joe Doerr, Lisa Helmig, Holly Jewkes, Darren Lemmon Anita Leach, Jenny Lippert, Alison Richards, Nikki Swanson, Wes Worley
2. District Participants: Tony Farque, Lance Gatchell, Cindy Glick, Stephen Todd Jankowski, Ken Loree,
3. Other: Darren Cross

Objectives of the Review

1. Were the objectives, standards, guidelines, and management practices specified in the Forest Plan being implemented? “Did we do what we said we were going to do?”
2. Were there lessons learned to improve future projects?
3. What are the vegetation management issues currently faced by the district?

Project Overview

A decision was made on the EA for the project was in 2008 but was rescinded so a new alternative could be analyzed in an effort to address economic viability issues in light of the economic climate at the time. The new alternative increased timber volumes and harvest efficiencies. A new decision was issued in 2009.

Purpose of Project:

1. Improve stand health and vigor and enhance tree growth
2. Encourage species diversity which more closely resembles that of native plant communities and reduce the population of off-site ponderosa pine in four stands where it is present within proposed harvest units.
3. Increase stand complexity
4. Accelerate structural development in stem-exclusion stands that are adjacent to patches of late-seral forest to ultimately reduce landscape level fragmentation and edge effects.
5. Provide wood products to the local market.

Proposed Action: The Smith Thin project commercially thinned 30-60 year old, even-aged, managed stands. Small gaps, ¼ to ½ acre in size, were placed in 5 to 15% of the area of

selected stands to contribute to stand complexity. Gaps were planted following harvest activities.

Stop #1 – Waterbars on Roads

Would like to have wider, more drivable waterbars on our roads, like maybe 1:6 or 1:8, so we don't damage our vehicles. There is a forest standard for waterbars. When the waterbars were done in this area, they were done for high-clearance vehicles. We don't have high-clearance vehicles anymore, we have SUV's that don't have a lot of ground clearance. Our waterbars should be built for the vehicles we are driving. It would also be a good idea if resource advisors on fires were made aware of the standards for waterbars.

Stop #2: Unit 33

We walked along a closed temporary road to access the harvest unit. The road was scarified, waterbarred, and a layer of slash was placed on the road to discourage use. Ken suggested that in the future we block the first 200 feet of a temporary road with slash and seed the rest of the road so it could serve as forage for big game, etc.

We looked at two gaps that were placed adjacent to each other within the harvest unit. Each gap was ½ acre in size. The gaps were planted much earlier than we are normally able to access this area because there was no snow this year. They were planted in March. It was fairly hot when they were planted and trees were dipped in terra-sorb. Trees were planted at about 200 TPA using incense cedar, western redcedar, noble fir, and western white pine. Survival was not very good (maybe 40-50%). There are a lot of natural Douglas-fir coming in however. With climate change the pines and incense cedar are good choices.

We also discussed the amount of slash on the ground and talked about treating high-risk areas. Sometimes our treatments exceed standards and guidelines. Slash takes longer to break down than we had previously believed. Slash was piled in the gaps and when piles were burned, they did not locate all of the piles.

There was a logging system change on the skyline units on this sale. They were changed from skyline to ground-based.

The unit looks good. There is good variability in the unit and the gaps look good.

When we place gaps in units like this, and plant the gaps, how do we re-located them in the future for PCT or other treatments we might do?

In the plantations should we manage the understory? If we take some plantations to early-seral and some of them to late-seral. There is a lot of ceanothus coming in, there is potential for a brush issue, but ceanothus is a nitrogen fixer. Need to consider the plant association when creating early seral habitat.

We looked at the Riparian Reserve where an un-harvested 100 foot buffer was retained.

We also looked at a gap adjacent to the road. There was already ox-eyed daisy on the road and now it is also in the gaps.

Stop 3: Vegetation Concerns on the District

Lots of thick young trees adjacent to the road as well as old growth or RA-32 stands. How do we treat these thickets along the roads?

Also, the understory in the RA-32 stands is much denser than the historic range of variability.

The Mid-Willamette LSR Assessment should describe a stand condition rather than an age.

Could use virtual boundaries

95-year old stand

- The live crown ratio in the stand is about 20%, stocking levels and high. Not a lot of vertical diversity, not much growing under the canopy of the stand.
- It is foraging habitat for northern spotted owls. If you thin it may affect flying squirrels in the short term but may be better in the long-term
- Look at the 12 biggest trees per acre and assess whether they are slowing down in growth or whether they are still growing. Unthinned are the 8-12 dominant trees per acre still on a trajectory to late-successional vs. those same trees in a thinned stand. If they are stagnant maybe you could build a case for thinning.
- What does No Action look at – need to flush that discussion out more.
- Could introduce gaps and leave the rest of the stand unthinned.
- 80 year age is a political roadblock not a scientific reality
- What is the target for restoration? These stands were managed for 4,000 years – underburned

Other issues include checkerboard ownership and the amount of critical habitat.

Wrap Up Comments

We want to thank the district for hosting this monitoring trip.

1. The discussion is appreciated especially the waterbar issue on roads, changing the logging systems from skyline to ground-based, we are not thinking about how equipment has changed over time.
2. We need to think about the risk the forest takes in planning areas. When there are compelling needs it may be worth the fight.
3. Work well as a team.
4. Looks great from an aquatics perspective.

5. Enjoyed the discussions
6. Need to look at the long-term goal for the stand – future To get to that point
7. Good trip
8. Sharing challenges
9. Nice thinning job
10. Good to see how they're doing business
11. Analysis of No Action is important
12. Push boundaries
13. Look from forest perspective
14. Implementation was really good
15. Will fix issue of drivable water bars
16. Sale looked good
17. Don't put gaps next to roads from a weed perspective
18. Need to think about how the FS goes forward in stands >80 years
19. Ken said to leave screening along roads to minimize weeds, he is trainable
20. There is a huge amount of knowledge on the district
21. Thinning and gaps looked great
22. Changing the logging system from skyline to ground-based worked great
23. Frank has done a great job seeing that this project was implemented well.
24. Make a bin list of forest challenges for Forest Plan revisions
25. CHU, private land issues on small district, use as test model for ideas
26. Smith looked good
27. Liked looking at the closing of the temporary roads. Good job closing them with slash.
28. Little impact of ground-based on steeper slopes. Looks good.
29. Take risks – think about level of risk. Too much money spent doing a lot of surveys if parts of project will be dropped. Doing lots of surveys – don't throw money away.
30. Other benefits besides timber.
31. Implementing ideas - contract has to mirror EA – like to see more positive effects rather than negative effects in document.
32. Thanks for making end result look like what we planned

33. With five operators on a project, there are five ways of accomplishing the objectives.
34. If you think you might want winter haul, then consult on it.
35. New to agency – good experience.

McKenzie River Ranger District 2014 - Spring Chinook Release Sites Improvements

Background: The Spring Chinook Release Sites Improvements Decision Notice was signed August 02, 2013; this included issuing a Special Use Permit for 5 years to the Army Corps of Engineers. Seven improvement sites were analyzed across the Willamette NF and the intent of the project was:

“The purpose of this proposal is to improve the truck access to and provide site-modifications at seven release sites identified by the Corps on the WNF as part of the on-going adult salmon and steelhead release program and to meet the requirements of RPA 4.7 from the 2008 NMFS Willamette Project Bi-Op. The project is needed because the existing condition is that current access for the release sites is limited by terrain or poor road conditions, increasing the excessive and rough handling of the fish.” EA page 2.

Office: Introductions by James Rudisill. Suzanne Schindler gave the objectives of the review which was to evaluate the consistency of project design and implementation; learning for future projects and talked about “Ice burg” project. For a white hat project there was lots of coordination between army Corps, recreation special uses, 4 Districts and public. Acting Deputy Forest Supervisor Expectations by Carmine Lockwood: communication between planning and implementation important in overall success of project; and to use what we learn for future projects. Shane gave safety briefing. Ray gave an excellent overview of EA project, history of Chinook salmon/Steelhead and Cougar Dam creation and mitigation.

Field: 3 stops:

- **Stop 1-** Travel to Cougar Creek Bridge

Replaced culvert with bridge which restored access for aquatic organisms, such as crawfish.

- **Stop 2**-Travel to Cougar Dam overlook to discuss the portable floating fish collector (PFFC) and the water temperature control tower.



Smaller fish are attracted to the fish collector and then removed, trucked and released downstream to avoid turbines in dam. The fish are attracted by the water current and the flow of the pump from the PFFC.

We also talked about the temperature control tower and below the dam is an adult collection facility. Temperature control tower was made to adjust/mix the water temperature for fish. The reservoir

created unnatural water temperatures that needed to be corrected for the fish.

- **Stop 3**-Travel to Homestead to see the project we are reviewing

Site improvements were made for the Homestead Campground area for the Spring Chinook release site. The new gate was installed to close traffic to the area since the campground has been removed for camping. The campground was removed due to cost constraints, remote access and under used. Some gravel parking areas were created for the fish truck to park and for the future if this area is designated a scenic area. The campground area also flooded during the winter and needed gravel to reduce erosion. The old gate was not yet removed. Some zebra striping painting was going to be done on the new gate.



The removal of one big leaf maple was done to allow truck access as prescribed in the EA. Also clearing of overhead branches, shrubs and small trees <4" diameter was done to improve access for the fish delivery truck.

The fish delivery pipe was installed with a corrugated telescoping pipe and painted black. The South Fork McKenzie River is a Study River for the Wild and Scenic River status and has a Recreation class. The pipe is seen as having a visual point impact and is only viewed in passing

from either the river or along the road. The pipe does not impair substantially the Wild and Scenic River. The river here has very good rearing habitat of Chinook and the release of salmon through the pipe will be a benefit.

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

Thanks to the District for hosting monitoring review. Special thanks to Ray for his effort in giving us the background information on the Fisheries of the area and in project coordination and implementation across the Forest.



This project was like an iceberg; lots of behind the scene work to get the release sites accomplished. There was a lot of communication with the public; a Special Use agreement with the Army Corps of Engineers; consultation with the USFW was done and work across all four Willamette Districts.

Carmine: This was a great project with many challenges of managing across the Forest and

with another agency.

McKenzie River Ranger District 2015 - Kafka Thin Project

Attendees

1. SO Review Team: Holly Jewkes, Tracy Beck, Wes Worley, Tim Lahey, Joe Doerr, Johan Hogervorst, Lisa Helmig, Cheryl Friesen, Jenny Lippert, Darren Lemon, Anita Leach
2. District Participants: Terry Baker, Cara Kelly, Elysia Retzlaff, Shane Kamrath, Shadie Nimer, Mei Lin Lantz, Bonny Hammons, Burt Thomas, Galen Anderson, Chelsea Porhman, Ray Rivera, Ruby Seitz, James Rudisill, Kenny Gabriel

Objectives of the Review

1. Were the objectives, standards, guidelines, and management practices specified in the Forest Plan being implemented? “Did we do what we said we were going to do?”
2. Were there lessons learned to improve future projects?
3. What are the vegetation management issues currently faced by the district?

Overview of Kafka Thin Project

- Burt and Shadie gave a nice overview of the project. The Kafka project used variable density thinning with skips and gaps in 35-45 year old managed stands to achieve the

following project purposes: 1) Increase stand health and vigor; 2) Promote diversity in terms of structure, and density within stem exclusion stands; 3) Provide an abundance of different native plant species in the understory; and 4) Provide wood products to the public.

Stop #1 – Kafka Thin Unit 3

- The unit was yarded with tops attached and grapple piled. No C-211 material was taken. This resulted in some very large piles.
- BE specs give minimum pile sizes but not maximum sizes.
- Every unit is different and changes happen in implementation. In the decision for this project fuel treatments were left open until after implementation. Then fuel loadings were reviewed on the ground to determine what fuel treatments would be done.
- We need to provide a picture to the purchaser of what 7-11 tons/acre looks like so they know what we are looking for in our fuel treatments.
- Variability in thinning density. Skip in frost pocket.
- In the opening the following projects were done: conifer encroachment control, seeding, and ceanothus control (snowbrush), etc.
- Large piles get so hot when burned that we may get ceanothus back. It might be patchy – that is good for bird foraging.
- Concern about placement of piles in the leave area.
- Why did we pile in the skip? Outside of unit? Were heritage surveys done where piles were placed?
- The piles were placed over the area Penny planted in the skip.
- Pile size specs for wildlife were >6 feet tall by 5-7 feet in diameter
- A little history - a long time ago we planned to supplementally feed bears in this area. Protesters came to the district dressed as bears and were fed fruit loops.
- Ripping on road not deep enough was supposed to be up to 20 inches
- Good canopy ratios (50%) on remaining trees.

Stop #2: Kafka thin Unit 1

- Three acre gap. Retained 4-6 trees per acre in the gap.
- Buffered Class III- pristaloma
- Bull trout habitat downstream

- Prescription was to leave 180 foot buffer on Class II stream (as per watershed analysis recommendations) and 60 foot buffer on Class IV stream.
- When first moved here Anderson Creek was the most productive bull trout stream in Oregon. It is dropping off now and don't know why. Transferred 25% of fish to Middle Fork – maybe that was the issue. Anderson Creek is spring fed.
- The prescribed 60 foot buffer on the stream in this unit is narrower than 60 feet – the buffer came to the break in slope but is only 41-50 feet wide. The intent of the buffer is being achieved.
- Need to consider equipment limitations when use fellerbunchers – can reach in 20 feet. Adjacent to stream – don't want erosion etc. getting into stream – goal is to protect soils.
- Snags left along gap and in gap.
- The gap is in the Riparian Reserve – if the reserve is on a Class IV – that is ok because there aren't water temperature concerns. If it were on a Class III stream gaps in the Riparian Reserve aren't ok.

Stop #3: Kafka Thin Unit 2

- Road into unit stored – no waterbars
- Shadie goes through many filters ahead of time with projects.
- Turkeys to Chocolates CE process.
- Small sales unique to McKenzie. Timber projects but they also have resource benefits for many other resources.
- In flat country – no effects to fish unlike rest of district.
- Three acre gaps – retained 4-6 TPA.
- Larger gaps – mapping unit size if >3 acres – it can be mapped and is considered a regeneration unit.
- Gap size discussion
- Plant gaps with shrubs or cuttings because of walk in expense
- The Forest Plan has snag standards for 5 acre gaps
- Research shows snow collects in gaps, could provide mitigation for climate change
- Gaps help to offer stuff like mixed severity fire (even if it isn't underburned).

Stop #4: String of Meadows

- String of meadows – frost pocket

- Connected them together and cut encroaching conifers
- Combined WL project CE's to get ahead a couple of years
- Forage enhancement, snag creation, down woody debris, meadow creation
- Group items we didn't have KV for –helps leverage other funding
- Talked about using Stewardship for these small sales
- Ceanothus cleared from meadow.

Wrap Up Comments

We want to thank the district for hosting this monitoring trip.

1. Learned a lot today
2. Trees respond to thinning – bear damage mitigation. Cheryl's comment about down woody debris- might keep animals from tearing up rest of stand
3. Break in slope as buffer – give a range of distances rather than a specific distance.
4. Great discussions with IDT members
5. Youth crew discussions
6. Encourage folks other districts to attend monitoring trip elsewhere on the forest.
7. Gap conversation was good
8. Ideas about what to plant
9. Good getting out with resource specialists – learning more each time
10. Helps district work together and improve communications within and between shops
11. We did what we said we were going to do
12. Burt and Shadie are characters
13. Great day – build trust between specialists and timber industry
14. Good conversation – lots of open dialogue
15. Thanks to Burt and Shadie for leading the day. You can tell that everyone enjoys working together.
16. Appreciate environment change from conference room.
17. Impressed by presentation – very professional
18. Good to have botanist as IDT leader – good cross training opportunity

19. Science goes out to folks – McKenzie takes science and uses it – Thanks for taking the risks – Go gaps!!
20. No perfect – about to have frank, respectful conversations.
21. Lots of moving parts – we are all human – good discussions not finger pointing
22. Well-functioning IDT
23. Always try to get better at what I do.
24. Great day – open discussions
25. Nice to put names and faces to new people
26. Glad TSO was here
27. How to make prescription happen on the ground
28. Honest conversation – great – helped to be open and learning
29. How y'all feeling about that?
30. Southern flair was great
31. Did we meet the intent
32. Good to see implemented sale, usually do presale
33. Gaps and climate change was interesting
34. Thanks to Burt and Shadie for entertaining us
35. Saw the project during the planning phase, it was good to see it implemented.
36. Small sales program unique
37. Communication, team work, professionalism. This was the appropriate analysis for a CE.
38. Good to see larger gaps – early seral
39. Take monitoring to see response with early seral species coming in

Middle Fork Ranger District 2014 - OWTFR Timber Sale

Background: The OWTFR Decision Notice was signed May 26, 2009; implementing the Proposed Action - Alternative 2. The EA was prepared under the authorities contained in the Healthy Forests Restoration Act (HFRA, 2003). The purpose of the project is to reduce hazardous fuels in the wildland-urban interface (WUI) around Oakridge, Westfir, and the High Prairie area north of Oakridge to increase public and firefighter safety, reduce fire suppression costs, restore and maintain the landscape to more historic conditions, and improve forest health, growth and vigor. Approximately 3,058 acres of second growth fire stands and managed stands ranging in age from 70 to 100 years (with the exception of one 137 year old stand) will be treated. Commercial thinning of 2,066 acres, About 992 acres have been identified for non-harvest fuel treatments to reduce ground fuels, ladder fuels and to promote health, growth, and vigor.

Middle Fork Ranger District 2015 - OWTFR Timber Sale

The day began at the District office at 9:00am with introductions. Joining the day from the public were Eric Ornberg, retired District Planner, John Donlon, landowner that worked with the District on a temporary easement for the OWTFR timber sale, and Greg Wagonblast of ODF who is working with the District and adjacent landowners on fuels reduction as part of a Community Wildfire Protection Plan (CWPP).

Objectives as described by Forest Supervisor Tracy Beck and District Ranger Duane Bishop:

- Answer the question, “Did we do what we said we would do on the ground?”
- Talk with our partners and ask, “Did we meet the expectations of partners to this project?”

Tracy – Very important to do after action review with Districts on our large-scale NEPA. He was glad to see that the Willamette does this as standard practice.

Eric Ornberg, OWTFR planner – gave background on the project, discussed the fire history and talked about the proposed action for the NEPA.

STOP #1 – Landing #1, Face Thin

- Originally logged in the 1930s
- Terrain was a struggle, given that there was private land on the top of the slope and federal land at the bottom.
- Standing on the landing near Westfir (see photo)



- that was added to reduce flight time and make helicopter yarding economically feasible.
- Lots of helicopter – at the start, 78% of the proposed harvest was helicopter; after much work by the IDT <50%. Got AFRC involved to talk about how to make helicopter work.
- OWTFR had both fish consultation and wild and scenic visual issues
- Noise disturbance was discussed with the City of Westfir including at city council meetings
- Some residents close by still had problems with noise; the mayor helped smooth some of those wrinkles.
- Reminded them that reduction of fire danger would benefit them in the long run
- Fish Consultation – three attempts. Originally, consultation on spring Chinook, bull trout and Oregon chub. Original bull trout consultation with US Fish and Wildlife used the counterpart regulations, which were quick and painless, but were eventually voided by lawsuit. The final BA was a Not Likely to Adversely Affect call. Oregon chub was also delisted in 2014 during this consultation. There was a period during all these changes where operations and fisheries were guessing on buffer widths in the field. Conservative calls worked out well in the end.
- Randy Green discussed the impacts that the underburn will have on the communities of Oakridge and Westfir
- Katie Isaacson will be working with the community on smoke issues
- Underburning will be slow and cool due to burning in the spring
- Fire personnel are working with smoke management people at ODF to identify the best window to keep smoke out of Oakridge and Westfir.

STOP #2 – Landing #2, Face Thin

- Stand age was about 75 at the time of the NEPA process
- Previous treatments occurred in this stand as evidenced by stumps that are hard to see
- Another additional landing added post-NEPA to reduce flight time for helicopter turns
- Commercial thin done in winter, 2014
- Fuels yet to be treated – underburn needed
- While deceptive from the road due to green-up, still lots of fuels needing treatment
- Visuals are good right now. At least 20,000 board feet per acre were harvested between stops #1 and #2, and it's hard to tell logging occurred recently.
- During sale preparation, the IDT needed to put together definitions for legacy trees identified in the NEPA as needing to be retained throughout the project – successfully done (copy handed out).
- Visuals – the goal in the EA was to not see landings from the scenic corridor (FR 1900, Auferheide Road). Operational changes to accommodate helicopter affected the visual screen between this landing and the road. Originally, landings were all planned on the other side of the river but a change was made to avoid costly road improvements that would have been needed.
- Lesson learned: loggers clearing landings will not always know what the pilot of the helicopter will require. In this case, a few more trees had to be cut to accommodate the pilot, which further affected visuals.
- Burning of piles and underburning of the hillside above are upcoming
- Duane – during the Deception post-fire tours with congressional staffers and enviros, Duane took the tour to this site to show them what can be done in WUI to prevent the effects of the Deception Fire. Staffers liked what they saw, environmental groups gave no feedback.



- Interesting story on the bidding process for Face Thin – Swanson Superior and Seneca had the exact same sealed bid (first time ever for the Willamette). They drew straws and Swanson won the bid, much to the chagrin of Seneca. 10 million board feet. Swanson's mill then burned down but they proceeded with the helicopter volume to keep their helicopter division working; waiting on the skyline units until the new mill is built.

STOP #3 – Face Thin Unit #9 underburn, viewed from across the river and from the bass along Rd 19



- 8-acre underburn done in the spring (May, 2015)
- Planned the burn timing knowing that a storm was coming – limited mopup
- Objectives: meet Forest Plan standards and guidelines
 - o 7-10 tons/acre of 0-3 hour fuels
 - o Limit mortality to <10% - got under 5%
 - o No more than 15% duff removal – got that due to spring burn

- o Limit smoke for the community
- For smoke management:
 - o Check conditions using help from ODF
 - o Burn when winds are up-canyon away from communities
 - o Burn eventually planned for the day of the prom in Westfir – big risk but decided to go ahead due to conditions
- Traffic control was needed to slow passers-by and to watch for rolling debris
- PR was on site to talk to those who might be concerned
- Lookout posted to watch smoke direction and hoses standing by to stop fire if needed
- Katie Isaacson (PR) – used social media to inform public and worked with mayor; talked to ODF frequently
- Jose Mercado – great outcome from the Forest Service work, including good match for private land treatment grant.
- Randy Green– challenge for upcoming plan revision – 7-10 tons/acre not appropriate for today’s management – limited science behind that; based on a slash fire that can be fought with the equipment that we have.
 - o Units downstream will be a challenge
 - o \$665,000 collected to do burning
 - o Things worked out well in this unit; may be others with more like 30% mortality instead
- Sequoia – we have our rules, Lane Regional Air Pollution Authority (LRAPA) has its own; we followed both
- Dick Davis– for spring burns, need to keep wildlife effects in mind as well such as effects to neo-tropical migrants. Fire stated that they are willing to work with all resources to find the best window to burn.
- Tim Lahey – at \$665K, BD costs were very high with this sale. Jose mentioned that instead of a mix of treatment types to keep costs down, they were required to do all underburning near town, which is more expensive.

STOP #4 - Red Tree Vole Discussion

- Wildlife biologists Dick Davis and Cheron Ferland shared the complex history of Survey and Manage requirements for the Red Tree Vole alongside of the planning efforts for OWFR. Sales discussed were High, First and WUI Thins.

- From 2010 ground surveys, it was determined that there were 900 potential nest trees to climb for High, First and WUI Thin timber sales.
- Late 2014 – asked the question, “What will it take to get three sales in compliance and under contract?” Much deliberation between the District, the SO and the RO.
- 2015 – climbing surveys
 - o Out of 582 trees climbed, 557 confirmed as not having RTVs – unexpected. An additional 95 need to be climbed to confirm.
 - o Discussed cost savings in the 2015 work
- Based on a red tree vole study done in 2000, watersheds were prioritized for RTV potential. First Thin fell into a low priority for potential to affect RTV while High and WUI were moderate.
 - o Results roughly confirmed the study results. First thin was relatively clear of RTV nests. High Thin lost one unit and buffering took place in other units to protect RTV. WUI Thin has the most legacy trees (80-400 years old) and the most RTVs are being found there.
- Dick discussed the complex methods of delineating RTV habitat areas and how it affects treatment areas. He shared the Dunk RTV Habitat Model results. Dick and Cheron have been working with Survey and Manage Specialists Rob Huff of the BLM and Carol Hughes of the Forest Service (PNW) on how to interpret modeling results. These specialists, along with our biologists have moved the ball forward for the region for RTV.
- Tracy Beck – if we take a risk on RTV anywhere in the region, it would be here due to the Wildland Urban Interface risk in the Oakridge/Westfir area.
- Duane Bishop – feels good about where we are and praised the efforts of Dick and Cheron. This work sets the table for future >80 treatments on the Forest.
- David Haupt – lots of prep work done by timber operations; looking forward to getting these sales out.

STOP #5 Private Land Right-of-way with John Donlon

- Two temporary agreements with Bud Long and John Donlon to be able to access two landings each at the top end of units in the Face Thin timber sale.
- Eric Ornberg worked with SO Lands
 - o Bugged down with personnel (3 different) and priority changes
 - o Finally got to the point where the RO needed to sign off, and they wanted to change the approach completely, going from temporary to permanent easements.
- Year delay in project, very close to affecting the Forest’s target

- o After Action Review – Susan Beale will be involved to get an agreement in place to prevent this in the future.
- o Hard for landowners – had to wait for quite some time
- John Donlon gave his perspective
 - o Struggles with trespass on his property as it is
 - o Not interested in a permanent easement
 - o The whole thing worked about better than he anticipated
 - o He had lots of fears and the District addressed them all
 - o Logging went three times quicker than he thought it would and the loggers did well
 - o A Great Grey Owl management area was set up right near John’s property – likes to watch them.

Forest IDT/Forest Supervisor Round Robin

Words that came up in discussion:

- “Perseverance”
- “Patience”
- “Looks great”
- “Great teamwork and integration”
- “Good communication from timber ops”
- “Kudos for communicating through complexity”
- Kudos to Darren Cross for providing leadership and pushing through on the RTV issue
- Thanks for RO financial help to complete RTV surveys for OWTFR
- Great community involvement in several aspects of the project

We ended the day with a drive by of two recent fires of “suspicious origin” within the project boundary, further validating the need for treatments planned in the OWTFR project area.

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 affect National Forest management.*

We frequently learn about the need for amendments through monitoring.

Since first published in the summer of 1990, there have been 43 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.
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.

Forest Plan Amendments

Amendment	Implementation Date	Type of Change
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.
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.

Forest Plan Amendments

Amendment	Implementation Date	Type of Change
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 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.
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.

Forest Plan Amendments

Amendment	Implementation Date	Type of Change
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, <i>Aster gormanii</i> ; Common adders tongue, <i>Ophioglossum pusillum</i> ; selected populations of tall bugbane, <i>Cimicifuga elata</i> ; and selected populations of Umpqua swertia, <i>Fraseran umpquaensis</i> .
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.
45	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.

Forest Plan Amendments

Amendment	Implementation Date	Type of Change
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	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.
49	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	9/17/2009	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	10/14/2009	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 Acres (9d)
55	06/06/2014	Thinning 95 acres in Tree Creek Old Growth Grove
56	04/07/2015	Reallocated 10 acres of Administrative Use Site (13a) to Developed Recreation Site (12a)
57	04/22/2016	Invasive Plant Management amendment to add aminopyralid to the list of herbicide ingredients.

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 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 Amendment 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.

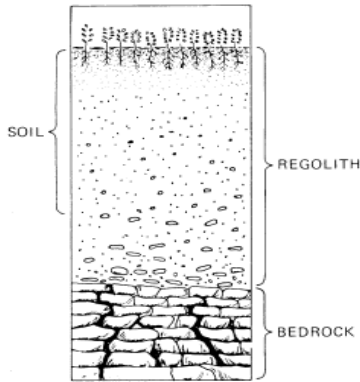
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Tim Lahey	<i>Timber Staff</i>

Acknowledgments

Monitoring activity on the Forest involves many people, far too numerous to list here. A few of these contributors or their organizations are acknowledged in the Findings section as their related work is presented. In addition, many volunteers contributed their time and expertise, as did Ranger District employees across the Forest.

<i>Soil</i>	Are S&Gs effective in meeting Forest goals for soil conditions, conditions, erosion, and nutrient cycling?	5 of soil in disturbed condition	Results OK
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Soil Conditions



Are S&Gs effective in meeting Forest goals for soil conditions, erosion, and nutrient recycling?

The Willamette National Forest includes land types that are naturally prone to mass movement. Where land management activities have occurred in these areas, ongoing monitoring is being done either visually or through electronic and/or mechanical instrumentation. There are at least 9 active sites on the Forest that are being monitored, and the majority of these sites are on the north end of the Forest in the North and South

Santiam River sub-basins.

On March 28, 2014, the Forest Geologist gave input on some stability issues on FS Road 2022, Canyon Creek Road. This main road serves as an important access route for several land managers as well as a haul route for both public and private timber haul on the Sweet Home Ranger District. The Forest Geologist looked at three main sites on this route after winter storms caused some movement in the road surface. Similar road stability issues were examined by the Forest Geologist at FS Road 2027 (Moose Mountain Road), 2041 (Soda Fork Creek Road) and 2045 (also Soda Fork) in cooperation with a cost share partner on the Sweet Home Ranger District. In each case, the Forest Geologist appraised the situation and made recommendations for either the ability to continue using these roads or how they should be fixed, keeping in mind the risk posed to aquatic and riparian resources.

Stability concerns on both hillslopes and forest roads have been closely monitored by Doug Shank, long time Forest Geologist for the Willamette National Forest over the last 4 decades. With Doug's retirement in 2016, the continuation of this long term monitoring is being transferred to new personnel and Willamette National Forest personnel will continue to monitor on-going stability concerns, working cooperatively with other land management agencies and companies to address specific needs.

CONTRIBUTORS