

USDA FOREST SERVICE

# Fiscal Year 2014 Monitoring and Evaluation Report

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Klamath National Forest

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This report is located on the Forest Service website at:

[http://www.fs.usda.gov/detail/klamath/landmanagement/planning/?cid=fsm8\\_049843](http://www.fs.usda.gov/detail/klamath/landmanagement/planning/?cid=fsm8_049843)

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# Introduction

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The 1995 Klamath National Forest Land and Resource Management Plan<sup>1</sup> (Forest Plan), as amended, provides a list of monitoring projects that are intended to be conducted on a regular basis. The Fiscal Year 2014 (FY 2014) Monitoring and Evaluation Report documents the evaluation of monitoring information related to the Forest Plan from October 1, 2013 through September 30, 2014. The objective of monitoring and evaluating Forest Plans is to determine whether programs and projects are meeting plan direction. Monitoring is the collection of information, on a sample basis, from sources identified in the Forest Plan. Evaluation of monitoring results is used to determine the effectiveness of the Forest Plan and the need either to change the plan through amendment or revision or to continue with the plan as written. Data are compared to data from past years, when appropriate. Monitoring results are emphasized rather than monitoring data. Evaluations are based on professional judgment when monitoring data are incomplete or lacking.

This report closely follows the format of the Monitoring and Evaluation Requirements outlined in Chapter 5 of the Forest Plan (p. 5-11 through 5-14). Specific monitoring objectives are presented, followed by the monitoring activities that were accomplished.

In some cases, monitoring was not conducted as specified in the plan. While most monitoring activities are accomplished on the prescribed schedule, some have been delayed due to funding shortfalls, lack of priority compared with other program needs, or lack of activity in that management program.

Monitoring activities, if they occurred in addition to those identified in Chapter 5, are listed at the end of each resource area.

The resources discussed in this report are organized following the organization of Chapter 5 of the Forest Plan. Each resource section identifies monitoring objectives, methodology, analysis results, and further action required, as applicable.

## Geology

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### A. Landslides

**Objectives:** Test assumptions for landslide sediment production rates in Forest Plan. Determine effectiveness of standards and guidelines in reducing landslide rates.

**Methodology:** Forest-wide landslide production rates can only be effectively monitored after landslide producing storms. No new active landslides were reported by the Forest in FY 2014. Consequently, no monitoring was warranted for this aspect of the objective. This element was monitored in depth following the flood of 1997 and adjustments were made to sediment production rates and management practices accordingly. The Forest monitored the application of geologic standards and guidelines by conducting field reviews of the Salmon Salvage, Petersburg Pine and Seiad Roads Phase I projects. Four motorized Forest Trail (Numbers 5599, 55100, 55101, and 55102), designated by the Motorized Travel Management Record of Decision, were reviewed for impacts to unstable lands. Forest Trail Numbers 55103 and 55104

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<sup>1</sup> The Forest Plan, as amended, is located at: <http://www.fs.usda.gov/main/klamath/landmanagement/planning>.

were revisited to see if the follow-up treatments completed in 2013 were effective in improving the drainage along the trails. The Humbug OHV Open Riding Area was also monitored for effects to landslide rates.

**Results:** The standards and guidelines and resultant project design features were found to have been fully implemented for the Salmon Salvage and Petersburg Pine projects. The standards and guidelines were found to have been effective at avoiding disturbance to unstable lands and impacts to landslide risk. There was some sidecasting of material onto unstable lands along the 46N50 road. It was determined that it would cause more disturbance to the unstable lands to attempt to remove the material than leaving it in place. So no mitigation was recommended but additional attention will be paid in the future when implementing stormproofing projects at the heads of unstable lands. The motorized Forest Trails had some maintenance issues, such as filled sediment basins and failing water breaks, which had a moderate potential for impacting landslide rates. There was no evidence of active landsliding along the trail sections monitored associated with the inefficient drainage. The follow up treatments on the drainage structures on Forest Trails 55013 and 55104 were effective in preventing any new debris slides along the trails. The areas narrowed by debris slides are still narrow but no rilling was seen along the trail or down the raw debris slide face. There are many rills and gullies on the steeper slopes (over 55 percent) in the Humbug OHV Open Riding Area which concentrate flow onto the hillslope. The area is on the lower 1/3 of the slope so the potential for damage from a debris slide or debris flow is low.

**Further Action Required:** Forest Trail Numbers 55099, 55100, 55101, and 55102 will receive regular maintenance to have drainage issues resolved. The trails will be monitored again in FY 2015 to make sure the mitigations were effective in minimizing landslide rates.

## **B. Geologic Hazards**

**Objectives:** Determine the level of hazardous materials (asbestos, radon, etc.) and if the Forest is meeting required standards. Evaluate effectiveness of standards and guidelines for reducing environmental threats from geologic hazards.

**Methodology:** Naturally occurring hazardous materials would be investigated if new facilities were being proposed or new rock pits developed in ultramafic rock. Investigations include GIS analysis, review of previous investigations and field review to determine the potential for the presents of hazardous materials. Laboratory testing for the presence or absence of hazardous materials may occur depending on the outcome of initial evaluation. Upon request by Forest staff, a geologic hazards risk evaluation would be completed using GIS analysis, review of previous investigations, and field review. The focus of the analysis would be to determine the threat to visitors and/or personnel from geologic events at a particular area or site on the Forest. Forest Staff requested an evaluation for naturally occurring asbestos in the ultramafic bedrock the Beaver Fire Area. Hand lens inspection indicated that there were thin seams of asbestiform mineral present in some of the rocks. Seventeen rock samples were sent to the laboratory for analysis on August 19, 2014.

Abandoned mine lands in the Humbug Creek 6<sup>th</sup> watershed were monitored in anticipation of future watershed restoration projects. Monitoring was systematic and included evaluation of unstable lands, mine drainage, hazardous mine openings, and hazardous materials.

**Results:** Ten of the 17 samples did not contain measurable amounts of naturally occurring asbestos. Lab testing revealed that chrysotile asbestos was present in five samples had concentrations between 1.25

percent and 5.25 percent chrysotile, and two samples had concentrations greater than 10 percent. The recommendation was made to minimize dust producing activities and/or exposure to the dust on the ridge when possible. No monitoring was done on hazards from abandoned mines, landfills, or seismic, volcanic or avalanche sources because the Forest was not aware of any new hazards relative to these threats for FY 2014.

Five abandoned mine complexes were monitored, four of which had been monitored in 1996 during an earlier abandoned mine lands inventory. The mines were in similar condition in 2014 as they were in 1996 despite having gone through two major storm events (1995-1996 and 2006 floods). Four of the five mines had hazardous mine openings and one had a collapsed mine opening. Two had surface water draining from the mine opening. One of the mines had the potential for legacy hazardous materials to be present. None of the mines monitored had evidence of landslides in the headwalls, tailings piles or other feature related to the mining operation.

**Further Action Required:** No further action is required.

### C. Unique Geologic Areas

**Objectives:** Assess the condition of unique geologic areas and effectiveness of Forest Plan standards and guidelines and resource management programs in preserving and protecting these resources.

**Methodology:** Monitoring visits were conducted to Geologic Special Interest Areas at: North Russian Landslide, Pumice Crater and Glass Flow, Kangaroo Lake, and Wooley Creek Batholith. Non-SIA unique geologic areas monitored were travertine springs in Deadwood Creek drainage and Sulfur Springs. Four noteworthy caves, including Plutos Cave, were monitored for disturbance. Five photo points were established in Plutos Cave to monitor graffiti and vandalism trends in the well-used cave.

**Results:** Geologic Special Interest Areas were all in good condition with little to no new disturbances. The North Russian Landslide was within the Whites fire perimeter and did have some moderate fire severity occur in the SIA boundary. This is consistent with the intention of the SIA. The travertine springs were intact and undisturbed despite being near a main roadway in the drainage. Sulfur Springs had a ring of small rocks to create a shallow soaking pool for one of the many sulfur springs along Elk Creek, but this did not impact the integrity of the spring system. The trails that lead to the main spring complex are well maintained and there is no evidence of sediment delivery from heavy trail use. A comparison of photos taken in January 2013 to photos taken January 2014 showed no new graffiti in Pluto's Cave, but some evidence of fire use in the cave. The two gates at Barnum Cave and Sand Cave were not vandalized this year. John Bell cave, which is a hibernaculum for bats, had no evidence of disturbance around or in the cave opening.

**Further Action Required:** No further action is required.

### D. Geologic Mapping

**Objectives:** Assess the accuracy of mapping units in the Forest Plan geologic database (rock type, geomorphic terrains, unstable and potentially unstable lands, etc.) (Implementation, Effectiveness). Evaluate the unstable lands component of Riparian Reserves for accuracy (Implementation, Effectiveness).

**Methodology:** The Forest has been working toward updating geomorphic mapping as part of project level analysis for the Lovers Canyon, Salmon Salvage and Little Deer projects as well as for the Burned Area

Emergency Response for the Whites, Beaver, and Happy Camp Complex Fires. The resulting field mapping is used to refine the Forest Geomorphic and Bedrock layers.

**Results:** Generally, the inner gorges are over mapped, especially in steep terrain. Some new active slides have been located. The bedrock mapping was found to be fairly accurate in the project areas. These data have been updated based on these results.

**Further Action Required:** No further action is required. Updates to the databases will be continued as needed.

## Soils

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**Objective:** To assess the implementation and effectiveness of soil standards, guidelines, and thresholds to maintain soil productivity. The overarching Forest Plan standards and guidelines for soils require that land management activities are planned and implemented to maintain or enhance soil productivity and stability; specific requirements for soil cover and soil organic matter are set. The Forest Plan calls for soil quality standards to be met on at least 85 percent of lands dedicated to producing vegetation. For soil compaction, a 10 percent or more reduction in total soil porosity of the surface soil over natural conditions on 15 percent or more of the area is a variation from standards that requires further action. The Region 5 supplement to Forest Service Manual 2550 provides indicators including soil stability, soil organic matter, and soil structure to measure soil condition. Soil condition classes are defined as “Good” (meets desired condition), “Fair” (partially meets desired condition), and “Poor” (does not meet desired condition). To assess the effects of management actions on soil functions, desired condition of each indicator is evaluated and determined to either meet desired conditions or not meet desired conditions.

**Methodology:** Activity units were evaluated to determine if desired condition for soil indicators (soil stability, soil organic matter, and soil structure) were met. Soil cover and effectiveness of erosion control, rutting and signs of erosion on landings and skid trails were measured to evaluate soil stability. Soil stability desired condition is met if an adequate level of soil cover is present and signs of erosion are not visible or very limited in degree and extent. Forest Plan Standard and Guideline 3-2 provides guidance on adequate levels of soil cover levels by soil texture class, slope steepness, and management activity. Soil organic matter desired condition is met when the thickness and color of the upper soil layer is within the normal range of characteristics for the site and is distributed normally across the area. Soil organic matter is measured by the percent of rutting in the unit. . Localized areas of displacement may have occurred but it does not affect the productivity for the desired plant species. Soil structure desired condition is met when soil structure and macroporosity are relatively unchanged from natural condition and soil strength is conducive to a favorable rooting environment for the desired species. Soil structure is measured by the percent compaction in the unit.

Units were monitored on a randomly selected subset of management areas. Randomly selected units are the same ones selected for Best Management Practice Evaluation Program monitoring and include: tractor (ground-based) yarding, cable yarding, helicopter yarding, and tractor piling of hazardous fuels.

**Results:**

*Cable yarding:* Point Two Unit 26 on the Scott River District was evaluated for ground cover and signs of erosion on landings and cable corridors. Soil cover was measured at 96 percent across the unit which

exceeds Forest Plan standards. No signs of erosion were found on the landing or the cable corridors. There is about two percent compaction in the unit. The unit met desired conditions for all soil indicators.

*Tractor yarding:* Point Two unit 24 on the Scott River Ranger District and Tamarack unit 21 and Trolley unit 5 on the Gooseneck District were evaluated for ground cover, water bar effectiveness, rutting, and signs of erosion on skid trails and landings. Point Two unit 24 had 93 percent soil cover which exceeds desired conditions for soil cover and 13 percent shallow rutting. The unit meets desired conditions for soil stability and soil organic matter. The unit has two percent of its area with compaction, so the soil structure desired condition is met.

Tamarack unit 21 had 92 percent soil cover which exceeds desired conditions for soil cover and 17 percent rutting in the unit. The unit meets desired conditions for soil stability and soil organic matter. Since the unit has 15 percent compaction, the soil structure desired condition is met.

Trolley unit 5 had 74 percent soil cover which exceeds desired conditions for soil cover and there is seven percent rutting in the unit. The unit meets the desired conditions for soil stability and soil organic matter. The unit has 25 percent compaction; however, the levels are light and the sandy loam soils in the unit are resilient to impacts of compaction, desired conditions for soil structure are met..

*Helicopter Yarding:* Unit 329 of the Salmon Salvage project was evaluated for soil cover and signs of erosion. Soil cover was about 72 percent across the unit which meets the Forest Plan standards. No signs of erosion or soil compaction were found in the unit. The unit meets desired conditions for soil stability, soil organic matter and soil structure.

*Tractor Piling:* The Lodgepole Station Fuels Reduction project used a feller buncher (mechanical harvester) to pile hazardous fuels. The area had 93 percent soil cover, which meets desired conditions for soil stability. Since the unit has 17 percent compaction and minor amounts of rutting, the unit meets desired condition for soil structure and soil organic matter.

*Conclusion:* Forest Plan Standards Guidelines for soil stability, soil organic matter, and soil structure were met for all areas monitored.

Management of the soil resource can be improved for future projects if skidder operators are discouraged from turning on sideslopes where possible. The recommendation is to reduce the amount of soil displacement by having the operator travel perpendicular to the hillslope as much as possible where slopes exceed 35 percent. These recommended changes will increase the percentage of activity units meeting desired conditions and will improve the maintenance of soil productivity and stability on National Forest lands.

**Further Action Required:** No further action is required.

## Water Quality

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### A. Best Management Practices Implementation and Effectiveness

**Objective:** Monitor implementation and effectiveness of Best Management Practices (BMPs) to evaluate their effectiveness at meeting state and federal water quality regulations.

**Methodology:** Implementation monitoring of BMPs is conducted using checklists completed by project staff to ensure that BMPs are implemented as prescribed. Effectiveness monitoring uses on-site

evaluations to determine if BMPs were effective at protecting water quality at the site-scale. In FY 2014, the Forest evaluated the following: 35 BMP randomly selected sites; two BMP sites from FY 2013 that were not rated previously rated as fully effective were reevaluated following corrective actions; and four other BMP sites that were evaluated as effective four to five years ago in order to determine their long-term effectiveness. Evaluated sites were located on all ranger districts and represented a variety of land management activities, including timber harvest, road and engineering, recreation, grazing, mining, and in-channel construction.

**Results:** Of the BMP sites evaluated for the first time in FY 2014, 83 percent were rated as fully implemented and 83 percent were rated as fully effective. Three sites failed implementation. Two sites were rated at-risk<sup>[1]</sup>, and one site failed effectiveness. Four sites were not rated.

Of the two sites that were re-evaluated in FY 2014 following at-risk ratings in FY 2013, corrective actions were taken at both sites that corrected the problems.

Regarding BMP sites monitored for long-term effectiveness, three sites remain effective but one was at-risk.

A full report containing the data and analysis submitted to the Water Board is posted on the Forest website under water quality:

<http://www.fs.usda.gov/detail/klamath/landmanagement/resourcemanagement/?cid=stelprdb5312713>

**Further Action Required:** For BMP sites that were evaluated as fully effective, no further action is required. Corrective actions and follow-up visits will be taken in FY 2015 for those BMP sites that were rated as either at risk or ineffective. Road storm-proofing projects and temporary road construction can be improved through adaptive management. In cases where sites were rated as less than fully effective, corrective actions were taken if necessary, and follow-up monitoring is planned for 2015.

## **B. In-stream Sediment and Temperature Monitoring**

**Objective:** Determine whether BMPs and watershed restoration are collectively effective at preventing cumulative effects to water quality at the watershed scale.

**Methodology:** Cumulative effects at the watershed scale are assessed by measuring in-stream sediment and temperature near the mouth of tributary streams. Effects are evaluated by comparing values in managed streams with those in reference streams.

**Results:** Data from FY 2014 has been collected. Results are pending analysis.

**Further Action Required:** None identified prior to results analysis.

## **C. Forest Cumulative Watershed Effects Modeling**

**Objective:** Test the validity of the techniques used for determining the threshold of concern used to assess cumulative watershed effects in the Forest Plan.

**Methodology:** The validity of the Forest cumulative watershed effects models are tested by comparing equivalent roaded area and modeled sediment supply with in-stream sediment.

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<sup>[1]</sup> The term "at risk" is being used to be consistent with the Region 5 BMP evaluation protocols and means the site is at risk of failing but is not yet considered to be ineffective.

**Results:** Results are pending analysis.

**Further Action Required:** None identified prior to results analysis.

## Air Quality

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**Objective:** Monitor the effects of forest management activities on air quality related values (biologic resources and visual quality) of the Class I area in Marble Mountain Wilderness using methods identified in GTR-RM-168 and to comply with the Clean Air Act.

**Methodology:** Data on the impacts of ozone and sulfur/nitrogen deposition data were compiled for sub-watersheds (6th field Hydrologic Unit Code) on the Forest during the Watershed Condition Classification analysis in 2010 and are still valid. Opportunistic observations on the visibility in the Marble Mountain Wilderness (Class I Wilderness) were made following the procedure in GTR-RM-168. These observations were made on June 10, 2014 (Paradise Lake), July 23, 2014 (Marble Valley) and August 24, 2014 (Shackleford Creek). Air quality related lichen plots, installed and photographed in 1992, were re-photographed in the Marble Mountain Wilderness in 2012. The photos were optically compared to determine if there was a loss of air pollution sensitive species indicating a worsening of air quality in the Marble Mountain Wilderness.

**Results:** The sub-watersheds in the Marble Mountain Wilderness (Upper Elk Creek, Upper Wooley Creek, Middle Wooley Creek, Lower Wooley Creek, North Fork Wooley Creek, Hancock Creek, Grant/NF Salmon River, Right Hand Fork Salmon River, Yellow Dog Creek, Shackleford Creek, Canyon Creek, and Kelsey Creek) all have sulfur/nitrogen deposition that is at least 10 percent below the critical terrestrial threshold. The sub-watersheds in the Marble Mountain Wilderness were all determined to have ozone levels that do not impact forest health. The visibility on June 10, 2014 and July 23, 2014 were within the screening level for the Wilderness for all observations completed. The visibility on August 24, 2014 was less than a mile, just which is below the desired condition. This is due to smoke from the many wildfires that were burning at the time including the Log, Whites, Beaver, and Happy Camp Complex. Preliminary analysis of the lichen plot photographs in fiscal year 2013 showed no perceivable changes in the relative percent of sensitive lichen species between the 1992 photos and the 2012 plot photos. There is no evidence that Forest management activities permanently impacted the air quality values (biological resources and visual quality) for the Marble Mountain Wilderness in FY 2014.

**Further Action Required:** No further action is required. The Forest Service would like to analyze the lichen plots in more detail with GIS data to determine if there is a statistically significant change in the relative percent of sensitive lichen species. The next round of long-term photo monitoring will be conducted again between 2025 and 2030.

# Biological Diversity

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## A. Ecosystem Diversity–Aspen

**Objective:** Track changes in vegetative composition. Track changes in “old growth” meeting currently accepted definition.

**Methodology:** The Goosenest Ranger District set up permanent transects and photo points and collected baseline data in the Black Rock Aspen Restoration Project. Plots were designed based on Jones et al. 2005<sup>2</sup> and USDA Forest Service 2004<sup>3</sup>. There are 37 plots and 74 permanent photo points (taken annually). Additionally, twelve areas were fenced and monitored for aspen regeneration.

**Results:** Results are pending.

**Further Action Required:** No further action is required. The Goosenest Ranger District will continue monitoring aspen response to treatments in 2015.

## B. Ecosystem Diversity–Seral Stages

See *Other Monitoring –Migratory Songbirds* within the *Wildlife* section.

## C. Size and Shapes of Openings

**Objective:** Ensure timber harvest openings are consistent with ecosystem composition, structure and function.

**Methodology:** The use of remote sensing data for this monitoring is identified in the Forest Plan. Since vegetative treatments have not created openings large enough to trigger remote sensing analysis, no monitoring has been conducted.

**Results:** N/A

**Further Action Required:** No further action is required.

# Sensitive Plants

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**Objective:** Assure maintenance of Sensitive plant populations and/or species viability.

## A. Project Planning

**Methodology:** There were about 450 acres inventoried in FY 2014 for projects in planning stages. Surveys were conducted for Sensitive species (36 vascular plants, five bryophytes, and one lichen) and one federally Endangered plant species. Different types of projects included: forest restoration (thinning, planting, salvage harvest, green harvest), mining, grazing, hazardous fuel reduction, ground water

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<sup>2</sup> Jones, Bobette E., David Burton, and Kenneth W. Tate. 2005. Effectiveness monitoring of aspen regeneration on managed rangelands: a monitoring method for determining if management objectives are being met in aspen communities. U.S. Department of Agriculture, Forest Service, Pacific Southwest Region. September 2005.

<sup>3</sup> USDA Forest Service. 2004. Browsed plant method for young quaking aspen: an annual monitoring method for determining the incidence of use on sprouts and young plants during the growing season. Pacific Southwest Region, December 2004.

monitoring wells, and water lines where threats and protection measures needed to be identified. Surveys were intuitively controlled, searching suitable habitats for new populations of Sensitive plant species, and confirming status of known populations.

**Results:** One new population of a Sensitive plant species (lichen) was found on the Forest: *Peltigera gowardii* (Veined water lichen).

**Further Action Required:** No further action is required. Sensitive plant species inventory is a regular component of the Klamath National Forest botany program.

## **B. Mitigation and Implementation Effectiveness Monitoring**

About 15 acres of field monitoring was conducted on sites where mitigation measures (buffers) have been applied for project implementation. Monitoring measured implementation (if buffers correctly applied) and effectiveness (if buffers protected species as expected).

*Ivesia pickeringii* (silky mousetail):

**Methodology:** Implementation with mitigation measures within *Ivesia sp.* habitat in the Roo project area continues to be monitored.

**Results:** Implementation was successful. The trees that were hand-cut and piled on the edge of the meadow were piled in areas designated by the botanist, and some piles were burned during the fall/winter of 2013. Four monitoring plots, including a control, were established in FY 2013 to observe the effect of pile burning on *Ivesia*, yet to be concluded. The response of *Ivesia* adjacent to piles that have been burned to date, has been favorable. Presently, meadow habitat containing *Ivesia sp.* appears to be stable. The area of meadow that was planted with *Festuca idahoensis* (Idaho Fescue) plugs in the fall of 2011 continues to show improvement in vegetative cover.

**Further Action Required:** No further action is required.

*Cypripedium fasciculatum* (clustered lady's slipper):

**Methodology:** Selected population sites are revisited annually within project areas under evaluation and where projects have already been implemented. In FY 2014, populations within the implemented Salmon Salvage project area were visited.

**Results:** Monitoring indicates that protection measures have been effective at protecting plants and their habitat. Populations that were expected to have survived the fire survived and flagged protection buffers were successfully implemented.

**Further Action Required:** No further action is required.

## **C. Other Monitoring**

### **Rare and Declining Species**

**Objective:** To determine the condition of special habitat occupied by rare and declining species that may be federally listed as Threatened or Endangered, or Federal Candidate Species.

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*Phlox hirsuta* (Yreka Phlox):

**Methodology:** *Phlox hirsuta* is federally listed as Endangered. This species occupies serpentine and peridotite outcrops in and around the town of Yreka, CA. The U.S. Fish and Wildlife Service (USFWS) monitors the population status, while both the USFWS and Forest Service agencies monitor the conditions of the occupied habitat, considering ongoing impacts from invasive species that surround the habitat.

**Results:** Monitoring of the habitat in the last seven years has indicated small infestations of both yellow starthistle and dyer's woad within occupied habitat and a substantial area of both weed species surrounding its habitat around Yreka, California (mostly on non-NFS lands). A partnership between the USFWS and the Siskiyou County Department of Agriculture is continuing, which includes participation from the Forest and private landowners. Non-native invasive species on lands with Yreka Phlox are being treated under landowner agreements to reduce potential impacts to the Phlox.

**Further Action Required:** No further action is required. The Forest plans to continue the treatment of infestations which may pose a threat to the habitat.

*Calochortus persistens* (Siskiyou Mariposa Lily):

**Methodology:** *Calochortus persistens* is a Candidate for being federally listed as Endangered. This species is geographically limited to three known occurrences west and north of Yreka, CA. The main threats to the species are thought to be an invasive species, *Isatis tinctoria*, locally known as Marlahan mustard or Dyer's woad, and the risk of fire suppression activities. In FY 2013 a Conservation Agreement was signed between the Klamath National Forest, the Fish and Wildlife Service, and the Bureau of Land Management. The schedule of conservation actions in the document specifies annual actions, including annual weed treatment.

As of FY 2014, annual weed treatments have been conducted adjacent to and within occupied habitat, in limited areas, for twelve years to reduce seed production and invasive species impact. Total acres treated in FY 2014 amounted to 140, an increase over FY 2013 due to the reduction of the infestations, allowing for more treated acres with the same amount of resources.

Also in FY 2014, a three-way cooperative project between the Klamath National Forest, the Fish and Wildlife Service, and the Bureau of Land Management was initiated to do a greenhouse study of the allelopathic effects of dyer's woad on germination and survival of Siskiyou Mariposa lily seedlings. In support of this project, Klamath National Forest staff collected seed of both the lily and dyer's woad.

**Results:** Monitoring of *Calochortus persistens*' occupied habitat indicates that where treatment has been taking place, *Isatis tinctoria* is gradually decreasing. The site is treated annually by a cooperative inter-agency group of volunteers and paid staff (Figures 1 and 2, photos by Marla Knight).



Figure 1: Before treatment in 2014



Figure 2: Before treatment in 2015

**Further Action Required:** Continued implementation of the Conservation Agreement.

Lake Mountain Foxtail Pine Botanical Special Interest Area:

**Objective:** To enhance habitat necessary for the maintenance of Foxtail Pine population at Lake Mountain Lookout. This is one of the only places on the Forest where visitors can drive to see this unique conifer species at the northern end of its range.

**Methodology:** Based on the assessment conducted in FY 2012 and FY 2013, the removal of red fir less than eight inches in diameter within the stand to reduce competition for resources has been implemented by hand-cutting and piling.

**Results:** The cutting, piling, and burning of fuels has been completed.

**Further Action Required:** No further action is required. Continued implementation of the final phase of the project, planting of foxtail pine seedlings (50-100) in spring of 2016, is planned.

Species New to Science

**Methodology:** Through an Agreement with the Carex Working Group, funded by multiple Forests in the Region, the taxonomy of the genus *Sedum*, and the unique elements in the subgroup *Gormaniana*, was investigated. The Klamath National Forest occurs in an area where multiple floristic provinces meet, providing for lots of variation in habitats. Several species of *Sedum* have been on the Sensitive plant list over the years, and have been very difficult to identify, and lacked a good field guide.

Additionally, the taxonomy of the genus *Polemonium* was recently re-worked, resulting in the description of several new species. The Klamath National Forest has habitat for one of the newly described species on the Goosenest District.

**Results:** The investigation of the genus *Sedum* resulted on several new species being described, one of which occurs on the Klamath National Forest. *Sedum marmorensis*, named for the Marble Mountains, is currently being described, and will be published shortly. The field guide that was a product of the Agreement is in draft form.

The suitable habitat for *Polemonium pulcherrimum ssp. shastense*, Shasta Sky Pilot, was surveyed on Rainbow Mountain on the Goosenest Ranger District, and was confirmed to be present. Herbarium voucher specimens were taken, and will be housed at the Klamath National Forest herbarium, and at California State University, Chico. (Figure 3)



Figure 3: *Polemonium pulcherrimum* ssp. *Shastense* (Photos by Jill Beckmann.)

**Further Action Required:** No further action required.

Vegetation Recovery, O’Neil Pond Methodology: Monitoring of vegetation recovery around the salmon rearing pond constructed at O’Neil Creek for the purposes of enhancing riparian habitat in lieu of habitat loss due to culvert replacement by Cal Trans, along Hwy 96. Vegetation recovery will be monitored for five years, or until 65 percent re-vegetation has been reached. Plots will be established using a standard sampling protocol.

**Results:** Forty-four plots were established along a 110 meter transect. An average of 45 percent vegetative cover was measured and an overall species diversity of 48 species was indicated. The non-native white sweet clover, *Melilotus albus* was dominant.

**Further Action Required:** No further action required. Control of white sweet clover will be attempted in FY 2016 to see if it results in an increase of native vegetation. Monitoring will continue until 65 percent vegetation recovery is reached.

#### Burned Area Monitoring

**Methodology:** Surveys of burned areas from the last five years to determine if rare pioneer species are present as a result of the fire.

**Results:** One population of *Iliamna bakeri*, Baker’s Globe Mallow, was documented in the Little North Fork area of Snowslide Gulch, from a fire dating back to 2008. This was a significant range extension for this species, normally known from the Great Basin flora, east of the Interstate 5 corridor. An incidental location of *Potentilla recta*, Sulphur Cinquefoil, an A-rated noxious weed was also discovered in this area as a result of surveys, and treated.

**Further Action Required:** No further action required.

# Wildlife

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## *Bald & Golden Eagles*

**Objectives:** 1) Determine trend and productivity of breeding population; 2) evaluate trend of habitat delineated to meet Recovery Plan objectives; 3) determine use, condition and trend of identified active and potential roost sites; and 4) assess effectiveness of Forest Plan standards and guidelines.

### **Methodology:**

*Goosenest Ranger District:* Fifteen of sixteen known nests and five winter roosts for bald eagles were surveyed and one driving census was conducted. The 15 known historic golden eagle nests have been inactive for several years. Golden eagles were observed during the mid-winter driving census.

*Salmon/Scott and Happy Camp/Oak Knoll Ranger Districts:* Bald eagles are monitored during the FY 2014 mid-winter Bald eagle count and during the Breeding Period Survey. The mid-winter Bald eagle count monitors bald and golden eagle winter use along seven monitoring routes covering the Mid-Klamath, Salmon and Scott Rivers, and Shasta and Scott Valleys (about 200,000 acres). These monitoring results contribute to the winter use trends that take place across the western United States. These surveys were conducted by Forest Service personnel, California State Fish and Wildlife, and community volunteers.

The Breeding Survey Monitoring includes six known bald eagle nest locations along the Klamath River and Scott Valley. The bald eagle nest at the mouth of the Scott River and the Caroline Creek nest were disturbed by wildfires that burned from mid-July thru September. It is unknown if this wildfire and associated suppression activities may have disturbed potential nesting and fledging of these bald eagle nests for FY 2014.

Additionally, one golden eagle nest was monitored in the Scott Valley. This pair was reproductive.

### **Results:**

*Goosenest Ranger District:* Of 15 bald eagle nest sites monitored, five produced six young, one presumably failed, four were inactive, five were not surveyed, and one was unknown. Bald eagles were detected in two of the five winter roosts. On the 180 mile driving route census, seven adult bald eagles were observed and six immature bald eagles were observed. Eighty raptors representing eight species were observed during the driving route census. The trend over the past several years indicates that the bald eagle population is stable. Successful nesting and winter use indicates that management standards are effective.

There are 15 historic golden eagle nests on Goosenest Ranger District; most have not been active for several years. In FY 2014, one nest was surveyed and determined to be occupied but reproduction was undetermined. Six golden eagles were observed during the Winter Driving Census.

All historic golden eagle data were compiled and submitted to USFWS for incorporation into a population demography study.

*Salmon/Scott Ranger District:* Four of the seven known bald eagle nests were active and three had confirmed successful reproduction. A total of 20 visits were made to monitor the nests. Seven survey routes were completed for the Mid-Winter Bald Eagle Count with 11 bald eagles detected.

*Happy Camp/Oak Knoll Ranger Districts:* One new nest was identified this year on the district, resulting in a total of eight bald eagle nests. All eight nest sites were active and five of the eight were reproductively successful. Each nest was surveyed three times totaling 28 visits.

Table 1 shows the results of the Mid-Winter Bald Eagle Counts on the Happy Camp/ Oak Knoll and Salmon/ Scott River Ranger Districts from 2007-2014. The population trend for bald eagles has been stable or improving.

**Table 1: Mid-Winter Bald Eagle Counts for Happy Camp/Oak Knoll and Salmon/Scott River Ranger Districts: 2007-2014**

Year	Number of Eagles Observed
2007	30
2008	30
2009	30
2010	37
2011	11
2012	12
2013	14
2014	11

**Further Action Required:** No further action is required.

*Peregrine falcon*

**Objectives:** 1) Verify nesting and reproductive success during breeding season. 2) Assess effectiveness of Forest Plan standards and guidelines.

**Methodology:** Field monitoring at one known peregrine falcon eyrie (or nest) was conducted to determine nesting status on the Scott and Salmon River Ranger District.

**Results:**

*Gooseneck Ranger District:* No known peregrine falcon eyries on the District.

*Salmon/Scott Ranger Districts:* One peregrine falcon eyrie was monitored with presence of two adults. Nesting was not confirmed and number of fledged young is unknown. No new nest sites were discovered in FY 2014. Peregrine falcons are no longer listed as Endangered or Sensitive due to a long-term improving trend in the population. Forest Plan standards and guidelines designed to maintain habitat and minimize disturbance to sites have been effective.

*Happy Camp/Oak Knoll Ranger District:* Two peregrine falcon eyries were monitored both in the Happy Camp Ranger District. Both eyries were occupied and reproductively successful. Both eyries had at least two young per nest.

**Further Action Required:** No further action is required.

Northern spotted owl

**Objective:** Determine number of pairs within Late Successional Reserves (LSRs).

**Methodology:** Standardized protocols were used for all inventories. Monitoring was conducted by Forest Service personnel, with assistance from student interns from the Student Conservation Association, U. S. Fish and Wildlife Service, and private contractors.

**Results:**

*Goosenest Ranger District:* Over 41,500 acres were surveyed for northern spotted owls (NSOs) as part of the planning process for the Butte Mountain LSR Habitat Restoration Project. Eighteen NSO territories were monitored within the project area. Two territories were occupied by NSO pairs and produced three NSO fledglings. Surveys were coordinated with Fruit Growers Supply Company in Bull Meadow. On the eastside of the district 41,288 acres were surveyed. A total of 30 territories were surveyed with various intensities (Table 2). Nine NSO territories were monitored, of which one territory had one NSO individual detected; the remaining territories had no detections. Barred owls were detected in several regions of the Butte Mountain project area. In FY 2014, barred owls were detected on nine of the 18 call routes surveyed on the district, compared to two routes in FY 2013.

**Table 2: Northern Spotted Owl survey totals for GNRD in 2014 field season.**

Goosenest Ranger District	West	East	Totals
Territories	22	9	30
Surveyed	-	-	19
Partial Surveyed	3	1	4
Occupied	2	1	3
Reproducing	2	0	2
Young	3	0	3
Fledged	-	-	Unknown
Failed	-	-	Unknown

*Salmon/Scott Ranger District:* Of the 30 NSO activity centers monitored, including sites within Late Successional Reserves, five sites had NSO detected. Two sites had a single NSO detected. Two sites had non-reproductive pairs. One site had confirmed reproduction with two fledglings. The remaining 25 historic activity centers were surveyed and determined to be unoccupied for the FY 2014 field season. Two barred owl activity centers were detected (both single barred owl detections).

*Happy Camp/Oak Knoll Ranger District:* Of the 28 NSO activity centers monitored, two sites had pairs and both were reproductively successful. Both sites produced two fledglings. Eleven sites had single NSO detection, and 14 sites had no detections. Seven Barred Owl activity centers were identified during the monitoring across multiple project areas. Three of the seven were confirmed Barred Owl pairs while the other four sites had singles.

**Further Action Required:** No further action is required.



**Figure 4: Northern Spotted Owl**

Northern Goshawk

**Objective:** Determine occupancy of suitable habitat.

**Methodology:** Standardized protocols were used for all inventories. Monitoring was conducted by Forest Service personnel, with assistance from student interns from the Student Conservation Association, USFWS, and private contractors.

**Results:**

*Goosenest Ranger District:* A total of 52 territories across 43,800 acres on the Goosenest were surveyed for northern goshawks (Table 3) A total of 23,080 acres was surveyed on the east side of the district and a total of 20,800 acres was surveyed on the west side of the district. On the east side of the district, six territories were occupied; six contained breeding pairs that produced four young. On the west side of the district, six territories had breeding pairs and produced five young. The remaining territories were assumed to be inactive.

**Table 3: Northern Goshawk survey summary totals on the Goosenest Ranger District for 2014.**

	Westside of District	Eastside of District	Totals
Territories	20	32	52
Surveyed	13	20	33
Presence	1	0	1
Occupied	6	6	12
Young	5	4	9
Fledged	5	6	11

*Happy Camp/Oak Knoll District:* Goshawk surveys were conducted within the Thom Seider, Two Bit, and Happy Camp Phase 2 project areas following intensive search protocols. Three territories were surveyed. Two of the three were active territories contained active nests. One nest contained at least one confirmed young.

*Salmon/Scott Ranger District:* Goshawk surveys were conducted in the Petersburg and Salmon Salvage Project areas following intensive search protocols. One goshawk nest was detected in Petersburg Project with one confirmed young. No other goshawks were detected.

**Further Action Required:** No further action is required.

*Willow Flycatcher*

**Objective:** Determine occupancy of suitable habitat.

**Monitoring and Results:**

*Gooseneck Ranger District:* No willow flycatcher detections or captures at the Antelope MAP station.

*Happy Camp/Oak Knoll and Salmon/Scott Ranger Districts:* Surveys were conducted for willow flycatchers (and other songbirds) at the Seiad Valley PCT1 Constant Effort Mist Netting Station. Data gathered at the Seiad Valley station contributes to regional and national songbird monitoring data sets and provides information on site

Productivity and long-term trends: Monitoring was conducted primarily by Forest Service personnel with the assistance of Redwood Sciences Lab, Klamath Bird Observatory, U.S. Fish and Wildlife Service, Mt. Shasta Audubon, and volunteers from the local community. A total of nine willow flycatchers were netted and banded for the FY 2014 banding season. One female had a brood patch, which was evidence of a nesting bird. This is a decrease from FY 2013 where 10 willow flycatchers were captured. See Table 4 and Figure 5 below.

**Table 4: Willow flycatcher captures at Seiad Valley PCT1 Constant Effort Mist Netting Station: 2010-2014**

Year	Number of captures
2010	17
2011	3
2012	3
2013	10
2014	9



**Figure 5: Willow Flycatcher**

**Further Action Required:** No further action is required.

Great grey owl

**Objective:** Determine occupancy of suitable habitat.

**Monitoring and Results:** No monitoring was conducted this year on the Klamath National Forest because pre-project surveys are not required. Removal of suitable habitat is not proposed by current projects.

**Further Action Required:** No further action is required.

Other Monitoring - Migratory Songbirds

**Objective:** Gather baseline data on Neotropical migrants.

**Monitoring and Results:**

*Gooseneck Ranger District:* Antelope Creek MAP Station is run by the Klamath Bird Observatory and the methods follow protocol as described by the Institute of Bird Populations. During the banding season 39 species of migratory birds were captured and numerous other species were observed.

*Happy Camp/ Oak Knoll and Salmon/Scott Ranger Districts:* PCT1 Constant Effort Mist Netting Station: This station is located along the riparian corridor of the mid-Klamath River in Seiad Valley, California, which is used by a diversity of riparian obligate migratory songbirds. This was the 17th year of monitoring for this station, one of the longest running banding stations in the Klamath Basin. The station is run by banding sub-permittee Sam Cuenca through a partnership with Redwood Sciences Lab, Klamath Bird Observatory, USFWS (Yreka Field Office), and the California Department of Fish. In FY14 volunteers from the California Conservation Corp, Siskiyou County Workability Crew, and the Student Conservation Association Program contributed time with banding operations. Methods follow protocol described by the Redwood Sciences Lab and the Institute of Bird Populations. During the FY 2014 season, 339 birds were captured including key species such as willow flycatcher, yellow warbler, yellow-breasted chat, song sparrow, Swainson's and hermit thrush. Data is compiled by the Redwood

Sciences Lab and the Klamath Bird Observatory. This monitoring data contributes to the understanding of the importance of songbird use in the Klamath Basin and the Pacific Flyway. See Figures 6-9 below.



**Figure 6: Female Western Tanager**



**Figure 7: Yellow-breasted Chat**



**Figure 8: Sharp-shinned Hawk**



**Figure 9: Two Wrentits**

*Other Monitoring – Swainson’s hawk and Butte Valley National Grassland avian monitoring*

**Objective:** Gather baseline data.

**Methodology:** Monitoring in Butte Valley National Grassland continues as part of an ongoing program that has provided data on Swainson’s hawk survival, reproduction and recruitment for over 20 years. Approximately 120 hawk territories were visited. During these visits, personnel also monitored several other avian species.

**Monitoring and Results:**

In FY 2014, 124 Swainson’s hawk territories were monitored and 95 nests were located in and around Butte Valley, California. Of the 95 nests located, eleven territories were new this year. Fifteen of the 95 nests were on National Forest System land. Apparent nest success was 31 percent with 29 nests failing over the season. A total of 114 nestlings were banded. Average productivity was 1.2 young per nest.

Data gathered during Butte Valley surveys are contributing to studies on natal dispersal and manuscripts on mating patterns, stable isotopes, and seasonal interactions are being submitted to peer-reviewed journals.

Partnerships were established with the Golden Gate Raptor Observatory, University of Nevada-Reno and University of California-Davis. Five volunteers contributed over 400 hours to the project in 2014. (Figure 10)



**Figure 10: Swainson's Hawk**

*Breeding Bird Survey:* The Breeding Bird Survey is a large-scale survey of North American birds. It is a roadside survey, primarily covering the continental United States and southern Canada, although survey routes have recently been initiated in Alaska and northern Mexico. The Breeding Bird Survey was started in 1966 and now contains over 5,000 survey routes which are surveyed in June by experienced birders. The primary objective of the Breeding Bird Survey has been the estimation of population change for bird encountered along habitats surveyed from roadsides.

**Objective:** The mission of the North American Breeding Bird Survey is to provide scientifically credible measures of the status and trends of North American bird populations at continental and regional scales to inform biologically sound conservation and management actions. Determining population trends, relative abundance, and distributions of North American avifauna is critical for identifying conservation priorities, determining appropriate conservation actions, and evaluating those actions.

**Monitoring and Results:** For FY 2014 season the Cecilville Route (#14429) was surveyed on June 19, 2014. For FY 2014, the Forest detected 23 species at many locations along the 15-mile route, which is slightly lower than the 26 species detected in FY 2013.

*Other Monitoring - Other Raptors (ferruginous hawks)*

**Objective:** Gather baseline data for uncommon species.

*Gooseneck Ranger District:* No ferruginous hawk nest sites were monitored in 2014.

**Further Action Required:** No further action is required.

# Fisheries Management

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## A. Sensitive Species

**Objective:** Determine population trends and habitat conditions for steelhead trout and Chinook salmon.

*Summer-run steelhead and spring Chinook holding census, Happy Camp/ Oak Knoll Ranger District:*

**Methodology:** The Forest Service conducts fisheries census and maintains population trend data for summer steelhead and spring Chinook, which are Forest Service designated Sensitive species. Direct observation snorkel surveys were used to collect the census data for all five tributaries to the Klamath River. The population trend data has been collected on a continuous or nearly continuous basis since 1987. In July and August 2014 a total of eight tributaries to the Klamath River were surveyed. The stream reaches surveyed totaled about 74 miles.

**Results:** Summer steelhead fish were observed in all eight tributaries. Total counts were 440 adult and 551 half-pounders. Spring Chinook salmon were observed in four tributaries. The stream reaches surveyed where Spring Chinook salmon were observed totaled about 19.5 miles. The total count was seven adults and zero jacks were recorded.

*Salmon River Summer-run steelhead holding census, Salmon/Scott River Ranger District:*

**Methodology:** The Forest, in cooperation with other agencies, completes annual survey (monitoring) of the mainstem, the North Fork, the South Fork, and the East Fork of the Salmon River. This data has been actively collected since the late 1960s and is important for the tracking of spring Chinook and summer steelhead trends over time. The census is conducted by direction observation snorkel dives. All stream reaches (about 91 miles) were completed in one day. Efforts were made possible through the collaboration of about 80 volunteers and other fish biologists (from California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, Resource Conservation Districts, local tribes, etc.).

**Results:** The 2014 summer steelhead run totals were 187 adults and 175 half-pounders, which was up slightly from 2013. Overall, the population trend for the summer steelhead run in the Salmon River has been stable since 2001, declining between 1987 and 2000 due to drought conditions and the 1997 flood.

*Salmon River Spring-run Chinook holding census, Salmon/ Scott River Ranger District:*

**Methodology:** The Forest Service, in cooperation with the Karuk Tribe and other agencies, continued the long-term monitoring of spring Chinook presence in the Salmon River drainage. Although species of primary interest was spring Chinook, steelhead and other anadromous salmonids were tallied as encountered. The Salmon River drainage was divided into reaches, and the reaches surveyed by teams of snorkelers. In July 2014, a total of 91 miles of the Salmon River were surveyed. Of the 91 miles, approximately 63 miles (including North Fork, South Fork, East Fork, and a portion of the mainstream) occur on the Forest. The Six Rivers National Forest completed the mainstem and Wooley Creek (about 28 miles) reaches. Although the primary non-governmental participant was Salmon River Restoration Council, additional crews were present from adjacent National Forests, California Department of Fish and Wildlife, U.S. Fish and Wildlife Service, Karuk Tribe, and local volunteers.

**Results:** The final count for all reaches was 851 Chinook (788 adults and 63 jacks) and 362 steelhead (187 adults and 175 half-pounders) recorded. The 2014 spring Chinook salmon run was down slightly from

2013. Overall, the population trend for the spring Chinook salmon run in the Salmon River has been stable since 2007, fluctuating between 1987 and 2006 due to drought conditions, ocean survival conditions, and the 1997 flood.

*Salmon River Spring-run Chinook Redd and Carcass Surveys:*

**Methodology:** This monitoring effort began in 2010 and consists of spawning ground surveys from a cooperative effort between the Forest Service, California Department of Fish and Wildlife as lead agency, Salmon River Restoration Council, and the Northern California Resource Center. In addition to providing information to land managers on fish spawning locations, these surveys are used to estimate the total in-river spawner escapement of spring Chinook salmon by the Klamath Fisheries Management Council and the Pacific Fisheries Management Council for determination of harvest allocations for the subsequent year.

The upper reaches of the North Fork Salmon and South Fork Salmon Rivers were surveyed twice each week during the spawning run. The Salmon River survey was conducted on every Monday and Thursday. Surveys began during the first week of September and continue into late- October. It is important to note that these surveys overlap from one FY into the next. Therefore, for FY14 the totals include those done during the 2013 survey (from 10/3/2013 to 10/31/2013) and the 2014 survey (from 09/15/2014 to 09/29/2014).

**Redd Surveys:** In FY 2014, redd surveys were conducted on the North Fork Salmon River from mile marker 12 on the North Fork to Mule Bridge. Redd surveys were conducted on the South Fork Salmon River from Matthews Creek to Little South Fork Salmon River. Redd surveys were conducted on the East Fork of the South Fork Salmon River from the Shadow Creek confluence to the confluence with the South Fork Salmon River.

**Carcass Surveys:** Since the surveys are conducted and analyzed by the California Department of Fish and Wildlife, detailed methods for carcass surveys and redd counts are found in their 2013 Fall Chinook Spawning Survey Report<sup>4</sup>. Carcass surveys were conducted on the North Fork Salmon River, South Fork Salmon River, and East Fork of the South Fork Salmon River using the mark and recapture methodology. This methodology is utilized by the California Department of Fish and Wildlife to estimate run size for the Mid Klamath River and its tributaries.

**Results:**

For the North Fork of the Salmon River Spring Chinook Salmon Redd Surveys, the total counts were 52 redds, 20 carcasses, and 194 lives. For the South Fork of the Salmon River Spring Chinook Salmon Redd Surveys, the total counts were 197 redds, 41 carcasses, and 1,251 lives. For the East Fork of the South Fork Salmon River, the total counts were 18 redds, zero carcasses, and 34 lives.

*Middle Klamath Fall-run Chinook Spawning Surveys: Salmon River (and tributaries), Scott River (and tributaries), and Middle Klamath River tributaries (Happy Camp/ Oak Knoll RD)*

**Methodology:** This monitoring effort began in 1992. It consists of spawning ground surveys from a cooperative effort between the Forest Service, California Department of Fish and Wildlife as lead agency, Yurok Tribe, Karuk Tribe, Quartz Valley Tribe, Salmon River Restoration Council (SRRC), Scott Valley

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<sup>4</sup> USDA Forest Service. 2014. 2013 Fall Chinook Spawning Survey Report. Klamath National Forest. Supervisor's Office.

RCD, Middle Klamath Watershed Council, Northern California Resource Center, and local schools and volunteers. In addition to providing information to land managers on fish spawning locations, these surveys are used to estimate the total in-river spawner escapement of fall Chinook salmon by the Klamath Fisheries Management Council and the Pacific Fisheries Management Council for determination of harvest allocations for the subsequent year. The Salmon River, Scott River, and other mid-Klamath River tributaries are surveyed on an annual basis using both carcass mark-recapture and/or redd count techniques. Redd data is used to make spawner estimations on smaller tributaries, while the mark-recapture technique (and in some cases redd counts) are used for population estimations on the Salmon and Scott Rivers.

The Salmon and Scott Rivers were surveyed twice each week during the spawning run. The Salmon River survey was conducted on every Tuesday and Friday and the Scott River survey was conducted on every Monday and Thursday. Miscellaneous tributary streams were surveyed every Wednesday. The surveys began on October 17 and ended on December 6, 2013 of FY 2014. In addition to the spawning ground survey effort on the Scott River a fish counting video weir was operated at roughly river mile 18. The video weir is operated by the California Department of Fish and Wildlife's Klamath River Project and is the primary method for estimating adult abundance in areas of the Scott River upstream of the weir. This video weir on the Scott River has been in operation since 2007. In addition to the video weir described above, fish counting video camcorders (video weirs) have been set up on the Shasta River and Bogus Creek (one video weir on each stream). The video weirs on the Shasta River and Bogus Creek have been in operation since 2001 and 2003, respectively.

#### Salmon River Fall Chinook Salmon Surveys

##### **Methodology:**

**Carcass Surveys:** Detailed methods for carcass surveys and redd counts are from the 2013 Fall Chinook Spawning Survey Report (USDA Forest Service 2014). Carcass surveys were conducted on the Scott River, North Fork Salmon River, South Fork Salmon River, and Mainstem Salmon River from Forks to Nordheimer using the mark and recapture methodology. This methodology is utilized by the California Department of Fish and Wildlife to estimate run size for the Mid Klamath River and its tributaries. Therefore carcass counts are not listed in the tables below for these rivers. In the portion of the lower Mainstem Salmon River, Salmon River tributaries, Scott River tributaries, and the Mid Klamath River tributaries where the mark and recapture methodology was not conducted, carcass counts are listed for those streams in the tables below.

**Redd Surveys:** In FY 2014 (October 17 to December 6, 2013), redd surveys were conducted on the Salmon River from mile marker 12 on the North Fork to the confluence with the South Fork, and from Matthews Creek campground on the South Fork to the confluence with the North Fork. The mainstem Salmon River from Forks to Nordheimer Creek (Reach 4; R4) was surveyed twice weekly; the other three mainstem Salmon reaches (R1, R2, and R3), from Nordheimer to the Klamath River, were surveyed for redds by snorkel diving approximately one time per week. Redd surveys on the Scott River were conducted from the confluence of the East Fork Scott River to the confluence of the Klamath River. However, access to private land excluded some reaches from being surveyed and known poor spawning reaches were not surveyed. Mid-Klamath tributaries surveyed included: Beaver Creek, Clear Creek, Dillon Creek, Elk Creek, Grider Creek, Horse Creek, Independence Creek, Indian Creek, Rock Creek, Rogers Creek, Seiad Creek, South Fork Clear Creek, Thompson Creek, and Ti Creek. Salmon River

tributaries surveyed included: Blackbear Creek, Indian Creek, Knownothing Creek, Little NF Salmon River, Methodist Creek, Nordheimer Creek, and Wooley Creek. Scott River tributaries surveyed included: Canyon Creek, Kelsey Creek, and Tompkins Creek. The mapping occurred the first week of November on both the Scott and Salmon Rivers. Based on surveys from past years, this is typically the approximate peak of the fall Chinook spawning season.

**Results:**

The Salmon River probably reached peak spawning in mid-October, although specific dates cannot be determined because by October 12, 2013 spawning activity had already begun (Figure 11). Overall, the survey effort was affected by the availability of surveyors, weather, and flows. For the Mainstem Salmon River Fall Chinook Salmon Redd Surveys, total counts were 445 redds), 127 carcasses, and 1,565 lives. For the North Fork of the Salmon River Fall Chinook Salmon Redd Surveys, total counts were 342 redds and 402 lives. For the South Fork of the Salmon River Fall Chinook Salmon Redd Surveys, total counts were 941 redds and 857 lives.

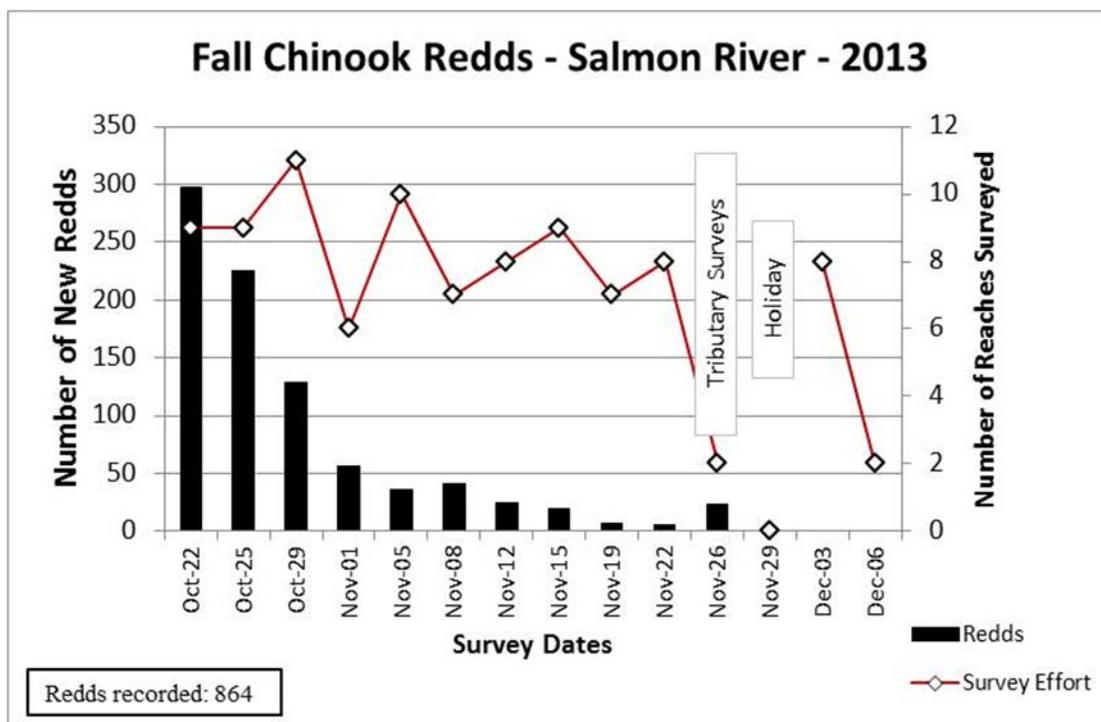


Figure 11: Fall Chinook redds observed on the Salmon River in 2013. Data is presented by week, not date, since not all survey days counted new redds. Surveys were conducted on the NF Salmon River from Mile 12 to Forks of Salmon; on SF Salmon River from Matthews Creek to Forks of Salmon; and on the mainstem Salmon River from Forks of Salmon to Nordheimer Creek.

Specific areas of the Salmon River display a greater preference for use by spawning fall Chinook. Specifically, GPS and map data indicate the reaches nearest Forks of Salmon show the highest redd density. Reach 4B (mainstem), 5A (SF Salmon), and 9A (NF Salmon) combined had over 40 percent of the total redds in the surveyed area. Amongst all reaches, those with over 100 redds include 4B (mainstem); 5B, and 6A (SF Salmon); and 9A (NF Salmon). Using survey data, the Salmon River is estimated to have had about 2,4800 fall run Chinook salmon return in the fall of 2013 (Figure 12). Based

on long-term tracking data from the CDFW, fall of 2013 data was slightly above average, ranking 20th for run size<sup>5</sup>.

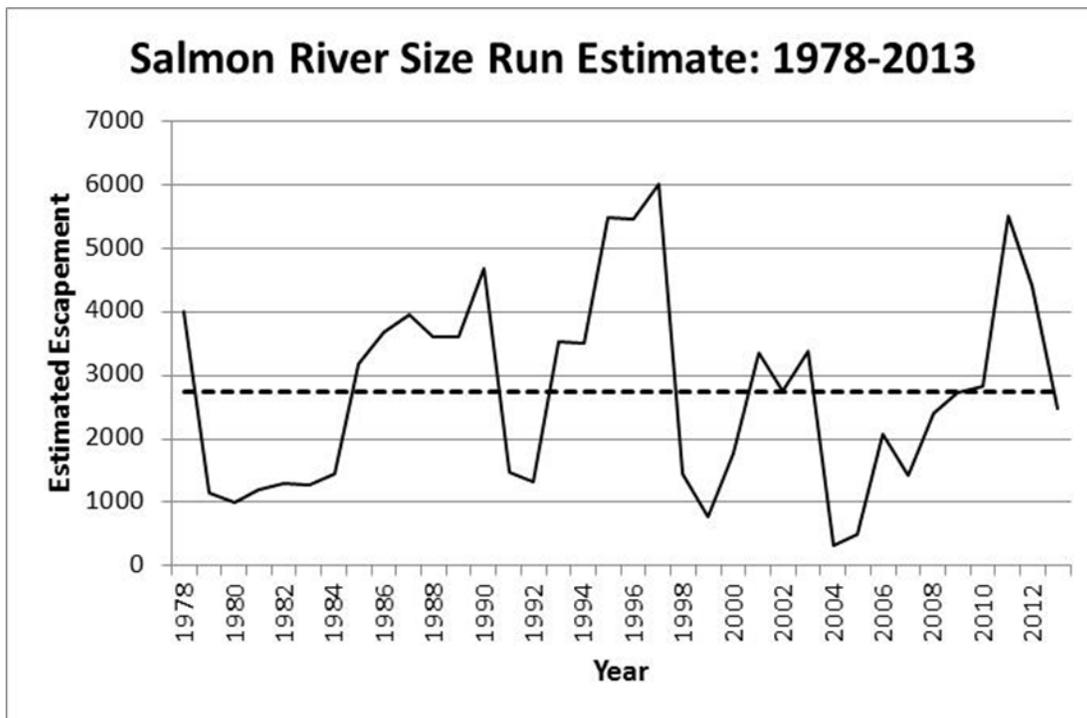
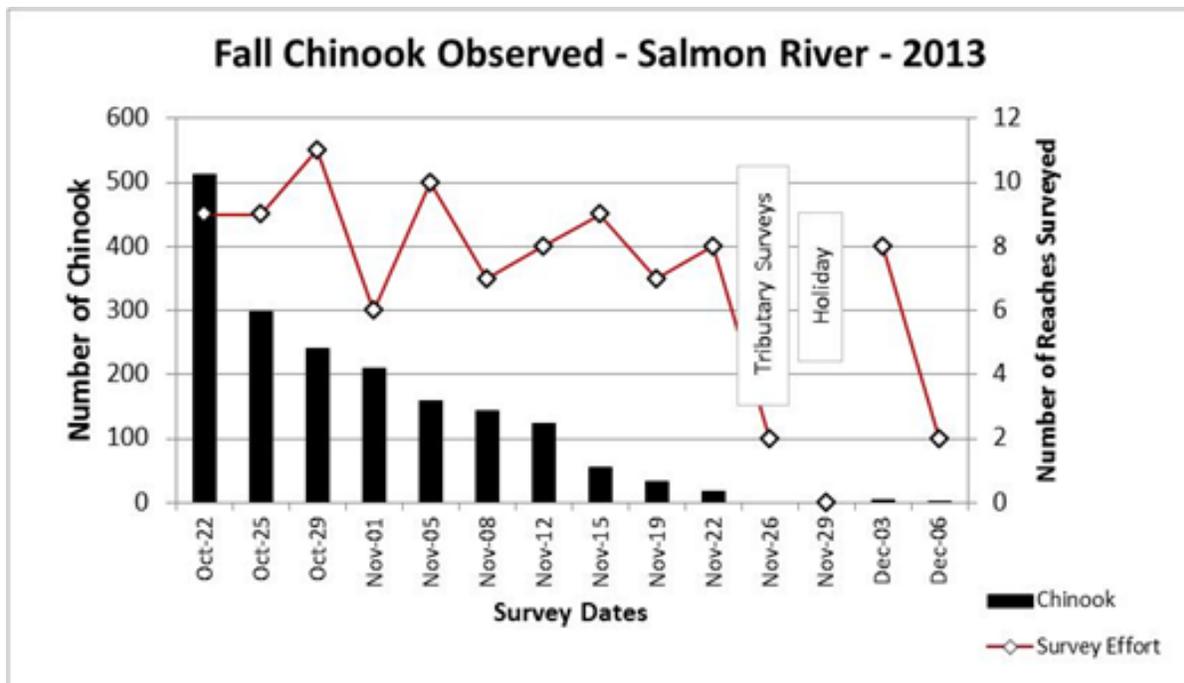


Figure 12: Salmon River run Size Estimates from 1978-2013

Live Chinook were tallied during surveys (Figure 13). As with redds, survey efforts were impacted by high flow and fish observation was affected by number of surveyors, weather, discharge conditions, and surveyor experience. Peak live Chinook were observed on October 22, 2014, subsequently numbers declined within the survey area. Similar to redd results, true peak cannot be definitely determined because fish were already very active upon the spawning grounds at the commencement of surveys.

<sup>5</sup> USDA Forest Service. 2014. 2013 Fall Chinook Spawning Survey Report. Appendix A – California Department Fish and Wildlife “Mega-Table”. Klamath National Forest. Supervisor’s Office.



**Figure 13: Observation of fall Chinook during the fall of 2013 Salmon River surveys.**

Based on the available data, the Scott River reached the peak of spawning on October 24, 2013 for Reach 1 through Reach 8 (Figure 14). This data is similar to that of last year, and may be slightly advanced compared to prior years. An examination of the data split by reach and date suggests spawning to have peaked below the USGS gauge approximately a week prior to that upstream of the gauge. This expected observation is the result of fish moving to the middle and upper portions of the Scott River as the spawning period progressed through October and November. There was also a slight increase in new redds which could be the result of new fish entering the system, as well as buildup of redds for those reaches not surveyed over the Veteran’s Day Holiday. Overall survey effort was affected by the amount of surveyors available, weather, and flows. Scott River Fall Chinook Salmon Redd Surveys resulted in a total of 1,641 redds and 9,141 lives counted.

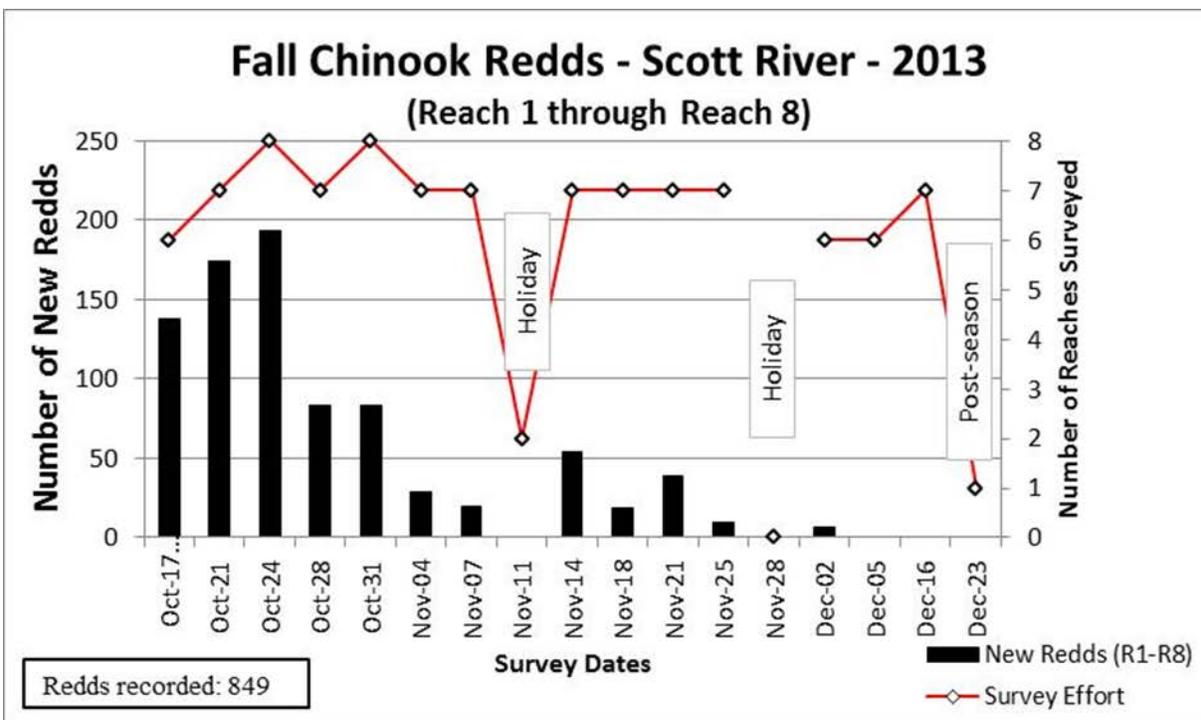


Figure 14: Fall Chinook redds observed and survey effort on the Scott River in 2013. Due to differences in redd tracking between lower and middle reaches, data displayed is for Reach 1 through Reach 8 only.

The Scott Valley Resource Conservation District performed redd and carcass surveys on private property from Reach 12 through Reach 15, resulting in a total of 708 redds being counted.<sup>6</sup> Landowner preference was to leave redds unflagged. Therefore, because “new” and “old” redds cannot be reliably differentiated, all are counted during each survey date. Overall peak spawning for Reach 12 through Reach 15 appears to have occurred two to three weeks later compared to downstream reaches.

Specific areas of Scott River display a greater preference for use by spawning fall Chinook. Within Reaches 1 through 8, the highest concentration of fish was in Reach 8 (above the canyon, and at the lower end of the Scott Valley). Next in prominence was Reach 1. While there were areas of elevated use within the other reaches (e.g., reaches 6 and 7), spawning in most instances can largely be described as dispersed. Examination of Scott Valley redd tallies show both Reach 13 and Reach 14 to display the most use behind Reach 8 for those areas surveyed on the Scott River mainstem.

Using survey data and video weir observation, the Scott River is estimated to have had about 4,624 fall Chinook salmon return in 2013 (Figure 15). Based on long-term tracking data from the CDWF Mega-Table, 2013 was slightly below average, ranking 18th for run size<sup>7</sup>.

<sup>6</sup> Note that there is an information gap related to this survey due to private property access restrictions.

<sup>7</sup> USDA Forest Service. 2014. 2013 Fall Chinook Spawning Survey Report. Appendix A – California Department Fish and Wildlife “Mega-Table”. Klamath National Forest. Supervisor’s Office.

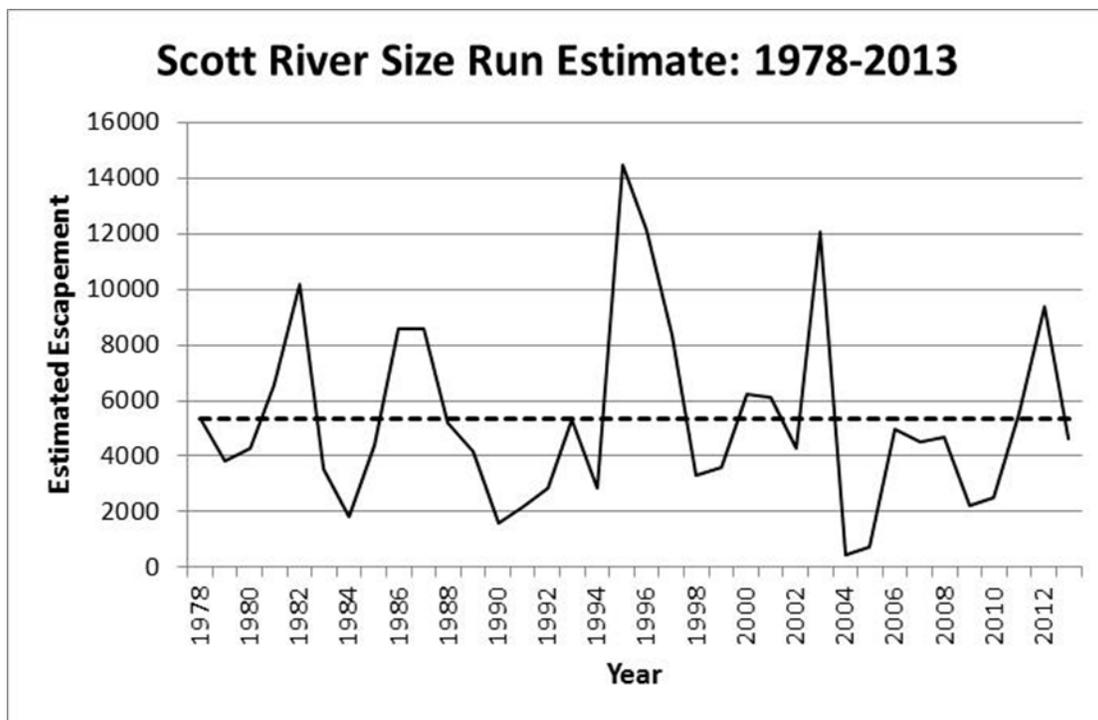


Figure 15: Scott River fall run size estimates for 1978 to 2013. Dashed line is average over long-term survey period.

Live Chinook were tallied during surveys (Figure 16). As with redds, survey effort is impacted by high flow; and fish observation is affected by number of surveyors, weather, discharge conditions, and surveyor experience. Peak live Chinook was probably mid- to late-October, but the entry of Coho to the system appears to have confounded counts. In early November, a large pulse of fish was observed in Reach 1. Some of these fish could have been Chinook as there was a small uptick in new redds in subsequent surveys in several reaches, but not nearly enough to account for the number of fish. However, the CDFW video weir, located at the Reach 6/7 break, did observe a large pulse of Coho arriving mid-November and experienced crew members also began to report schools of Coho in the system about the same time. Similar to redd results, true peak cannot be definitely determined because fish were already very active upon the spawning grounds at the commencement of surveys.

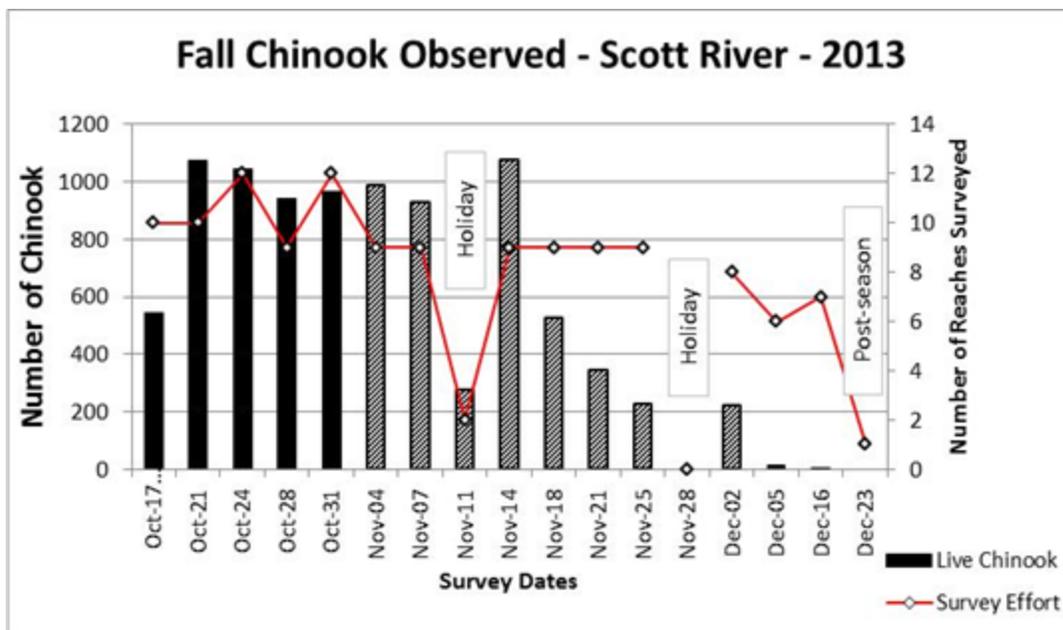


Figure 16: Observation of fall Chinook during the 2013 Scott River surveys.

Mid-Klamath River Tributaries Fall Chinook Salmon Redd Surveys resulted in a total of 754 redds, 341 carcasses, and 1,925 lives. Mid Klamath River tributaries (Happy Camp Area) that recorded greater than nine redds in 2013 were Beaver, Clear, Dillon, Elk, Grider, Horse, Indian, Rock, and Thompson Creek.

For the most part, weather and high water did not affect surveys to the extent as occurred in 2011. Portions of Indian Creek (1/2 mile) and Elk Creek (1/3 mile) were not surveyed in 2013 due to limited access on private property.

Salmon River Tributaries Fall Chinook Salmon Redd Surveys resulted in a total of 105 redds, 14 carcasses, and 37 lives. Wooley Creek was the only Salmon River tributary that recorded greater than nine redds in 2013.

No redds were observed in the three Scott River tributaries (Canyon Creek, Kelsey Creek, and Tompkins Creek) that were surveyed in 2013.

The number of Klamath River fall Chinook salmon returning to the Klamath River Basin in fall 2013 is estimated on Table 5. This includes both total number of natural spawner escapement and number of fish taken by recreational and tribal harvest<sup>8</sup>.

<sup>8</sup> Klamath River Fall Chinook Salmon Age-Specific Escapement, River Harvest, and Run Size Estimates, 2013 Run by the Klamath River Technical Team dated 5 March 2014

**Table 5: Fall Chinook Salmon returning to the Klamath River Basin**

Age	Count	Percent of Total Run
2	14,416	8.0
3	55,259	30.8
4	108,799	60.6
5	1,067	0.6
Total	179,541	100

For more information on survey results, see Appendix D of the *Klamath River Fall Chinook Salmon Age-Specific Escapement, River Harvest, and Run Size Estimates, 2013 Run* by the Klamath River Technical Team, dated March 5, 2014.

**Further Action Required:** Continue coordination with California Department of Fish and Wildlife for the annual Fall Chinook Salmon Spawning Ground Surveys. Continue coordination with Salmon River Restoration Council for the annual Salmon River Spring-run Chinook holding census. Continue conducting the Summer-run steelhead and spring Chinook holding census on Happy Camp/ Oak Knoll Ranger District.

## **B. Management Indicator Species**

**Objective:** Determine population trends and relationship to habitat changes for steelhead trout and rainbow trout.

**Methodology:** Monitoring for steelhead trout is covered under Sensitive Species monitoring (above). California Department of Fish and Wildlife is conducting a field study of fish, amphibians, and reptiles in the High Mountain Lake surveys of the Klamath, Cascade, and Sierra Nevada mountains. The multiyear project, begun in 1995, has collected data on three fourths of the Sierra Nevada's 10,000 high mountain lakes, and on nearly all high mountain lakes in the Klamath and Cascade mountains of California<sup>9</sup>. Habitat changes are measured through the Aquatic and Riparian Effectiveness Monitoring Plan (AREMP) program and the Klamath National Forest has an intensive watershed condition monitoring program for 'managed' and 'reference' streams organized through the Klamath National Forest hydrology department in coordination with Total Maximum Daily Load (TMDL) compliance.

**Results:** The AREMP program has found an overall positive trend in watershed conditions over the last 18 years (final report is pending).

Monitoring populations of the resident form of rainbow trout is confounded by potential impacts from 1) fish stocking operations conducted by private interests and the California Department of Fish and Wildlife and 2) the targeting of rainbow trout common in recreational fishing. The number of high mountain lakes stocked with hatchery (resident rainbow) trout by the California Department of Fish and Wildlife has been reduced since 2008 and now no hatchery (resident rainbow) trout are stocked within the currently

<sup>9</sup> (Chapter 4 in <http://www.dfg.ca.gov/news/pubnotice/hatchery/>)

managed range of the Southern Oregon/Northern California coho salmon (Figures 4-36 and 4-34 respectively in the January 2010 Environmental Impact Report (EIR)), and one location for the Klamath Mountains Province (KMP) steelhead<sup>10</sup>. Salmon and steelhead are stocked at five locations within the KMP steelhead distinct population segment (DPS) in the Klamath and Trinity River basins (Figure 4-36 of the same January 2010 EIR). Naturally produced steelhead juveniles may be preyed on by hatchery steelhead that may be residualizing in the Klamath and Trinity Rivers below Iron Gate and Trinity River Hatcheries. Residualization of hatchery steelhead and predation on naturally produced salmon and steelhead fry has been demonstrated in the Trinity River, representing a potential threat to natural salmon and steelhead populations. Based on the time and size at release, hatchery coho salmon yearlings may also prey on naturally produced steelhead fry. The hatchery programs have the potential to cause significant impact to the survival of wild juvenile salmon and steelhead. Rainbow trout have been observed preying upon juvenile steelhead; additionally, their diets and habitat preferences overlap. Therefore, hatchery rainbow trout may prey upon native steelhead or compete with them for rearing and spawning habitat. According to the January 2010 EIR prepared by California Department of Fish and Wildlife, the “implications of competitive interactions between hatchery and wild fish may be particularly serious for steelhead because the freshwater environment probably limits production.” There is also a potential for hatchery trout to compete for spawning sites with native steelhead, due to overlapping spawn times and spawning habitat preferences. These influences on the population make habitat monitoring a more reliable system of tracking trends for fish Management Indicator Species.

**Further Action Required:** Coordinate with California Department of Fish and Wildlife on their ongoing monitoring, continue coordination with AREMP.

### C. Fisheries Management

**Objective:** Determine effectiveness of Forest Plan standards and guidelines in meeting objectives.

**Methodology:** The Northwest Forest Plan, a management strategy applied to 24 million acres of federal land in the Pacific Northwest, was approved in 1994 and incorporated into the Forest’s 1995 Forest Plan. The Northwest Forest Plan’s Aquatic Conservation Strategy that requires the protection, restoration, and monitoring of aquatic ecosystems under the Plan’s jurisdiction was incorporated. The AREMP program<sup>11</sup> was developed to fulfill the monitoring component of the strategy. Monitoring is conducted at the subwatershed scale (U.S. Geologic Survey 6th-field hydrologic unit). These sub-watersheds are approximately 10,000-40,000 acres in size. In 2014 invasive aquatic species were also monitored.

**Results:** The AREMP monitoring reflects the effectiveness of standards and guidelines related to aquatic systems, including the implementation of the Aquatic Conservation Strategy identified in the Forest Plan, as adopted from the Northwest Forest Plan Record of Decision. The AREMP monitoring effort determines present watershed condition every five years for every 6th-field watershed (with greater than 25 percent federal ownership along the stream length) based on upslope and riparian data derived from GIS layers and satellite imagery. In-channel attributes are also measured each year in a subset of watersheds to supplement the watershed condition assessments and validate the models used to assess stream condition.

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<sup>10</sup> California Department of Fish and Wildlife, U.S. Fish and Wildlife Service Biological Resources, Final Hatchery and Stocking Program, Environmental Impact Report/Environmental Impact Statement 4-73 January 2010

<sup>11</sup> <http://www.reo.gov/monitoring/reports/watershed-reports-publications.shtml>,

AREMP also tracks changes in watershed condition over time; and reports on the Northwest Forest Plan's effectiveness across the Northwest Forest Plan area.

AREMP Data for the 2014 field season (June through September) is not available at this time. No reports for the 2014 field season have been posted to the web site listed below<sup>8</sup>.

**Further Action Required:** None.

#### **D. Other Monitoring – Klamath River Water Temperature**

**Objective:** Monitoring water temperature

**Methodology:** In conjunction with information from the water temperature monitoring program, streamflow monitoring can be used to model and better understand thermodynamics in the Klamath River; and can be used to plan fisheries restoration projects such as restoration, enhancement, and creation of cold-water summer thermal refugia that facilitate salmon and steelhead survival in hot periods when water quality in the Klamath River becomes sub-optimum or lethal for salmonids. Seven sites on the Klamath River and 126 sites on Klamath River tributaries were surveyed in 2014.

**Results:** The resultant data will be analyzed to establish existing baseline aquatic habitat conditions, to determine fish species distribution, and to estimate fish species abundance. Stream survey information will be used to plan and assess the effects of restoration forestry, will be used to plan and assess effects of upslope watershed restoration, and will be used to plan and assess effects of fisheries restoration projects.

**Further Action Required:** None.

#### **E. Other Monitoring – Clean Water Act, TMDL**

**Objective:** Collect data to determine stream conditions for reference and managed streams to meet Clean Water Act-TMDL conditions. Monitoring was also done as part of the AREMP watershed condition monitoring for the Northwest Forest Plan area.

**Monitoring:** Techniques used were developed with the California Water Quality Control Board staff to measure sediment, temperature, shade values, and V\*<sup>12</sup> and included the use of a specialized camera and Hobo-temp data loggers. There are 156 Hobo temp sites monitored in 2014 as part of this project. Stream temperature was monitored in a network of 90 watersheds representing most of the major tributaries on the Forest. Reference conditions were monitored in 15 minimally disturbed watersheds that represent the natural background condition. The Forest monitored sampled areas with well-mixed stream temperatures in order to better understand the overall watershed condition. Temperatures in thermal refugia at the reach scale were not measured.

**Results:** Data was provided to evaluate listing/delisting of streams under the Clean Water Act. There are 22 watersheds on the Forest that have altered shade due to human-caused disturbance and stream temperatures higher than the Water Quality Control Board threshold for support of beneficial use for salmonids. In these streams the objectives for temperature are not attained. Watersheds with human-caused shade loss of less than 0.1 percent have a negligible effect on stream temperature at the watershed scale. The remaining 78 watersheds appear to meet the temperature objectives of the Basin

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<sup>12</sup> Stream Monitoring Field Guide: Protocols and Methods. USDA Forest Service Pacific Southwest Region.

Plan. All of these streams have either no human-caused alteration of stream shade, or any alteration has not reduced stream temperatures below the threshold required to support beneficial uses. In no instances have stream temperatures increased by more than the five degrees Fahrenheit (2.8 degrees Celsius) allowed in the Basin Plan temperature objective. The natural receiving temperature of many streams on the Forest is warmer than the thresholds used by the Water Quality Control Board to assess adverse effects to beneficial uses for salmonids. Nearly half of the reference streams on the Forest exceed the 16 degrees Celsius threshold identified for support of beneficial uses for adult salmonid migration and non-core juvenile rearing. However, salmon are still occupying these streams. Some researchers suggest that salmon in the Klamath River system are adapted to naturally warmer temperatures.

**Further Action Required:** None.

## Visual Resource Management

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### Visual Condition & Scenic Character

**Objective:** To determine the trends of Forest-wide Visual Condition and Scenic Character every 10 years. Visual Condition in this report refers to the degree of scenery disturbance perceived by typical forest visitors. Scenic Character in this report refers to the degree of ecologically established scenic identity perceived by people who intentionally observe the Forest. “Scenery” and “Scenic Character” are current “best science” terms for “Visual Resource” and “Landscape Character” as applied in the 1995 Forest Plan.

**Methodology:** In FY 2014, informal observation of visual condition and scenic character occurred during 13 field days in 2014, when traveling to, and then evaluating several Forest projects across the Forest. This informal observation has occurred continuously even before the Forest Plan, primarily on vegetation manipulation project areas as viewed from the Forest Plan’s designated sensitive roads, rivers, trails and recreation settings. Field photography of Visual Condition and Scenic Character occasionally accompanies these informal observations.

This report also quantifies adverse vegetation conditions that have impaired Scenic Character, using nationally established LANDFIRE “Vegetation Departure” data that is consistent with established Forest-level wildfire history. Consistent with Standard and Guideline 11-4, Forest projects and recent Forest vegetative treatment accomplishment records have also been evaluated to determine their effectiveness in perpetuating the Forest’s ecologically established Scenic Character.

**Results:** Informal observations and the data described above tend to confirm two Forest-wide trends: 1) Improving Visual Condition (fewer obvious scenery disturbances); 2) Declining Scenic Character (loss or impairment of ecologically established scenic vegetation attributes).

Visual Condition, the degree of scenery disturbance perceived by the average person, has steadily improved. This is due to a substantial reduction in large clearcut and road-associated scenery disturbance typical of the 1970’s-1990’s, combined with a continuous natural softening of disturbances through revegetation and temporal weathering. Forest programs have produced fewer scenery disturbances in recent decades, through less intensive activities such as forest canopy thinning and understory fuels reduction.

Scenic Character, the ecologically established scenic identity perceived by people who intentionally observe the Forest, has declined through vegetation changes. Over the last 50+ years wildfire suppression

has widely interrupted historic wildfire influences that shaped and maintained the Forest's attractive vegetation diversity. Interruption of historic wildfire has resulted in much of the Forest appearing uncharacteristically dense with small vegetation and a lack of historic scenic variety (Figure 17). This interruption has resulted in the Forest's vegetation departing from ecologically established conditions, displayed in Figure 18. The Forest's historically scenic vegetation patterns, species, sizes and densities have largely been transformed into crowded and uniform stands of smaller and weaker trees. Scenic views through the historic Forest's canopies to landforms and geologic features, water bodies, large trees amidst small openings, forest understory vegetation and wildlife have been largely concealed by dense thickets of small trees, or replaced by them altogether.

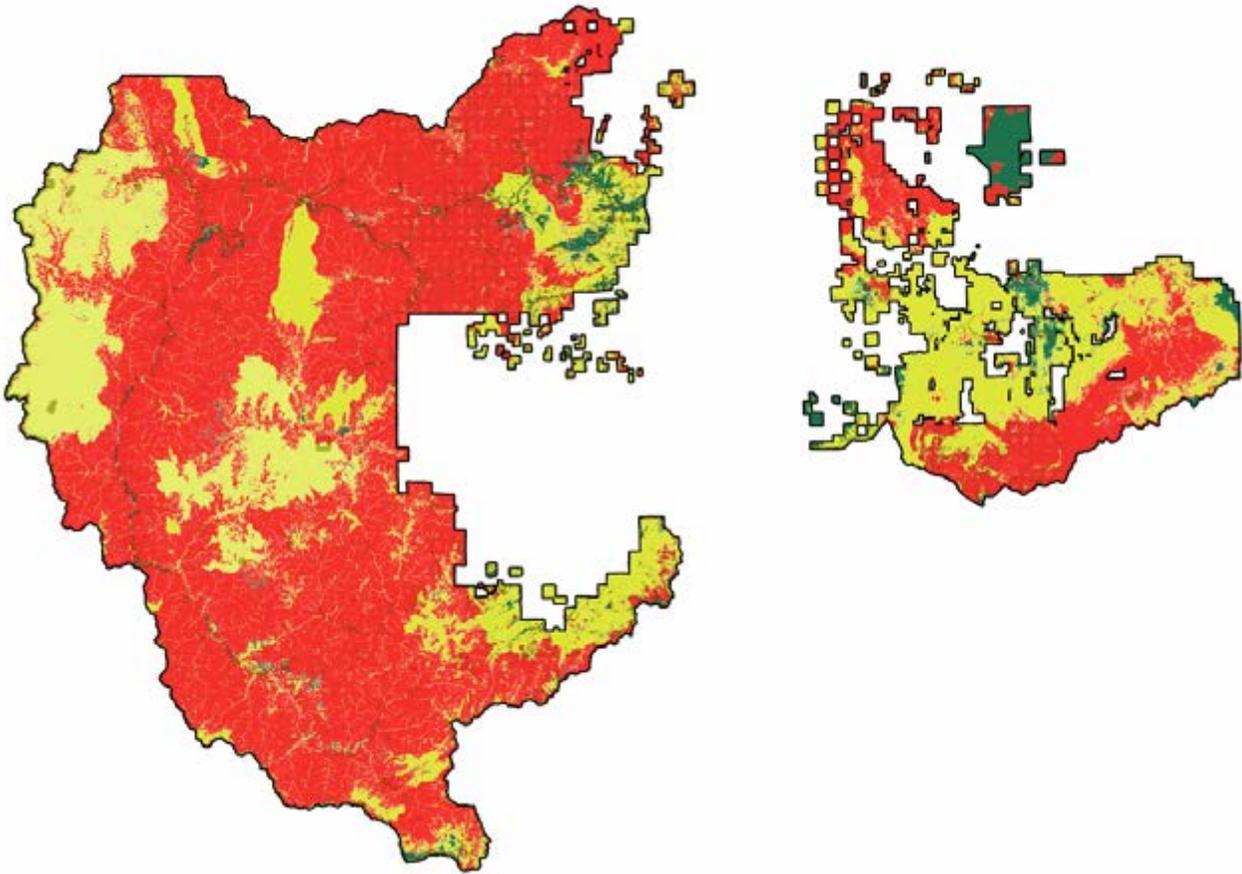


**Figure 17: Example of how the interruption of historic wildfire has resulted in much of the Forest appearing uncharacteristically dense with small vegetation and a lack of historic scenic variety (Horse Creek).**



**Figure 18: Example of the Forest’s historic, ecologically established Scenic Character, displaying open forest conditions, large trees, and a diverse understory (Ball Mountain).**

Impairment to the Forest’s vegetative Scenic Character attributes is quantified in this report as a “Vegetation Departure” from historic/reference ecosystem conditions (LANDFIRE Fire Regime Condition Class/FRCC inventory, 2008). This Vegetation Departure analysis measured each acre of the Forest for its degree of change from its historic, ecologically established (pre-European contact) “reference conditions”, in terms of vegetative species, seral stage/size and stand density. In Figure 19 below, the Klamath National Forest Vegetation Departure Map shows that 62 percent of the Forest displays a “High Departure” from historic, ecologically established vegetation conditions; 33 percent as “Moderate Departure”; and only five percent largely reflects historic vegetation conditions, as “Low Departure”.



**Figure 19: Forest departure from its historic, ecologically established vegetation condition.**

In recent years (FY 2009-2014) Forest ecosystem restoration projects have reversed adverse vegetation and Scenic Character conditions within relatively small yet ecologically strategic areas (approximately one percent of the Forest's total acreage each year, per national natural resource data) (Figure 20). During the same time period, a little more than one percent of the Forest has received natural wildfires each year, which consistently helps restore vegetative Scenic Character attributes towards their historic, ecologically established reference conditions. Restorative vegetation benefits of such projects and wildfires tend to last for at least 10 years. Therefore it is estimated that each decade approximately 20 percent of the Forest could receive vegetation benefits that at least partially restore Scenic Character towards historic, ecologically established conditions (two percent of the Forest enhanced each year by projects and wildfires x 10 years each decade). Climate change also impacts vegetative Scenic Character attributes through local droughts that reduce availability of essential moisture and nutrients, cause wildfires to exceed historic size and severity. Scenic Character within untreated and unburned areas of the Forest will continue to display impaired vegetation attributes and evolve subject to other influences such as climate, insects, disease.



Figure 20: Photo after restorative thinning treatment, resulting in more open and varied scenery conditions, supporting attractive large trees and future understory accents (McKinley Mountain).

**Further Action Required:** Formal monitoring of Visual Condition and Scenic Character trends as specified in Chapter 5 of the Forest Plan, Table 5-1, has not been performed for this report and is not planned for next year's report. This is because Visual Condition/disturbance trends are improving and remain consistent with Forest Plan goals and direction. The adverse Scenic Character trend can be effectively monitored through Forest-level analysis similar to Vegetation Departure described above, using a best-science ecological baseline to measure Forest Scenic Character condition (apply and adapt FRCC "Vegetation Departure", or similar), in combination with project level information. Scenery information provided in this report, in addition to known forest and project level information, is sufficient to direct Forest Programs and Projects, meet Forest Plan requirements, and fulfill the Forest's Scenery conservation responsibilities. As described above, Visual Condition and Scenic Character can be gradually improved through program and project activities designed to increase both scenic quality and ecological resilience.

### **B. Visual Quality Objectives**

**Objective:** Determine compliance with Forest Plan Visual Quality Objectives every three to five years.

**Methodology:** Informal monitoring of compliance with Visual Quality Objectives is typically performed

during travel across the Forest and as part of new project analyzes. These informal observations took place during over 13 field days in FY 2014, focusing on completed vegetation manipulation project effects as viewed from the Forest Plan's designated sensitive roads, rivers, trails and recreation settings. These informal observations often include site visits and field photography.

**Results:** Based upon informal monitoring described above, the frequency of project compliance of Forest Plan Visual Quality Objectives appears to be very high, about 95 percent.

**Further Action Required:** Since informal monitoring indicates a high degree of Forest Plan Visual Quality Objective compliance, formal monitoring of Visual Quality Objective compliance is not necessary and will not be performed. Informal monitoring of Forest Plan Visual Quality Objective compliance will continue in 2015 and beyond.

## Wilderness

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**Objective:** Use the Limits of Acceptable Change concept to refine future wilderness management direction.

**Methodology:** Informal field observation of compliance with Forest Plan wilderness standards and guidelines was performed by Wilderness Rangers and District Recreation Officers. Monitoring of wilderness campsites was conducted in Forest Wilderness areas in 2009 and 2010 and is planned to continue on a five-ten year cycle. Information stations were installed at wilderness trailheads in 2010, 2011 and 2014 to better inform wilderness visitors of wilderness values, local resource issues, and methods to reduce wilderness impacts. Solitude (encounter) monitoring was conducted in 2012 within the Marble Mountain and Russian Wilderness areas and in 2014 in the Siskiyou Wilderness.

**Results:** Observations have enabled Forest Wilderness managers to identify needs and develop strategies to protect wilderness character. The Limits of Acceptable Change and the Recreation Opportunity Spectrum management tools identified in the Forest Plan are in need of refinement during Forest Plan revision to better support the achievement of desired wilderness conditions.

**Further Action Required:** None required. Monitoring in FY 2015 will focus on visitor education. In FY 2016, additional wilderness campsite monitoring is planned.

## Lands Program Management

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**Objective:** Determine if land adjustments have increased administrative efficiency, and whether Forest outputs are adversely affected.

**Methodology:** Since FY 2002, the Forest has acquired 840 acres in five parcels. No parcels were acquired in FY 2014.

**Results:** About 4.5 miles of Forest boundary has been eliminated since FY 2002, reducing the total miles of landline that requiring location and posting.

**Further Action Required:** No further action is required.

# Timber Management

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## Growth and Yield Projections

**Objective:** Determine if growth and yield projections for silvicultural prescriptions are occurring as projected.

**Methodology:** The Region 5 Remote Sensing Laboratory maps and monitors vegetation throughout the Region. Lab personnel use baseline inventory maps in conjunction with inventory plots to assess the vegetation resources and associated uses such as forest health, timber volume and growth, wildlife habitats, old growth forests, watershed conditions, and surface fuel mapping. The Klamath National Forest was inventoried in 2004 and updates were done in 2007 using Landsat photos and validated by the Province Ecologist.

**Results:** Growth projections are in line with Forest Plan expectations.

**Further Action Required:** None.

## Wildland Fire Effects on Plantations

**Objective:** Determine average rate of loss of plantations to wildland fire.

**Methodology:** Locations of plantations from FACTS were overlaid with fire boundaries of wildfires that burned in 2014. A silviculturist visited the fire area in the fall of 2014 and mapped the fire effects to both natural stands and plantation. That information was used to plan the reforestation needs following the fire.

**Results:** Approximately 22,917 acres of plantations were impacted by the Beaver fire, Little Deer fire, Happy Camp and July fire Complex's. Within these acres 5,552 acres of plantations were significantly impacted by moderate to high severity fire with few of the trees within those areas surviving.

**Further Action Required:** Most plantations affected by moderate to high severity fire will be reforested. Areas with poor site quality and historical brush and hardwood stands will not be reforested. Site preparation for planting will begin in FY 2016 and continue through FY 2019. Reforestation of the 5,552 acres will start in the spring of FY 2016.

## Dispersal of Harvest Openings

**Objective:** Ensure that spacing of harvest openings conforms to Regional policy and Forest Plan direction.

**Methodology:** The Forest Plan modeled green tree retention harvest as the primary silvicultural system to be implemented on the Klamath National Forest. This prescription has been used only sparingly on the forest since the adoption of the Plan. Understory thinning, the primary prescription for timber harvest, does not create openings in the forest canopy. Large openings due to timber harvest are rare and spacing is not an issue. For this reason, no monitoring has been conducted.

**Results:** N/A

**Further Action Required:** None.

### Timber Stand Improvement

**Objective:** Determine success of release and stand improvement practices to meet desired future condition.

**Methodology:** The Forest pre-commercially thinned 2,586 acres of wild stands and plantations combined and released 663 acres of plantations in 2014. These stands were inspected to validate that the prescriptions were appropriately applied. Monitoring consisted of placing plots in many of the stands and recording spacing of the trees and the amount of competing vegetation removed. Other stands were inspected by a visual walk-through method to determine if treatments met standards. The stands take a number of years to respond to the treatments after being suppressed for a period of time, so immediate measurement of the plantations would not yield an increase in height or diameter growth.

**Results:** All (or one hundred percent) of treated stands met the required standards.

**Further Action Required:** None.

### Other Monitoring Efforts – Timber Marking, Reforestation Success, and Sale Implementation

Timber marking is reviewed by Quality Control Group check cruiser for conformance with Timber Theft Plan. Reforestation success was monitored through survival surveys and certification of planted stands. Post-sale treatments required under contract were monitored by sale administration personnel and reviewed by program staff from the Supervisor's Office.

### Other Monitoring Efforts – Site Preparation and Reforestation Targets

In FY 2014, the Klamath planted zero acres. Species planted in FY 2012 included ponderosa pine, Douglas-fir, sugar pine, incense cedar, Shasta red fir and white fir. Third year survival averaged 50 percent. Shasta red fir and white fir planted in 2012 burned in the 2014 fires. The 50 percent mortality excludes trees that were burned.

### Other Monitoring Efforts – Timber Targets

Allowable sale quantity, reforestation, and timber stand improvement activity accomplishments are derived from data in the Planned Timber Sale Accomplishment Report, the Forest Service Activity Tracking System, and the yearly Plantation Survival Report. The Forest offered and awarded about 33,987 hundred cubic feet of timber and convertible products in FY 2014. This exceeded the assigned target of 19,600 hundred cubic feet by about 57 percent. The volume offered for sale includes sawlogs, biomass, posts, poles and firewood produced through a combination of forest management activities, including thinning, sanitation, and fuelwood and post and pole cutting.

The annual reforestation program fluctuates, dependent largely on wildfire and post-fire salvage and fuels treatment. Mt. Hebron is scheduled for replanting on 747 acres and the Salmon and Butler fires will plant 536 acres in FY 2015. Planting and subsequent release on burned sites where fire-killed trees are not removed continue to pose a management challenge; The immediate threat of falling trees and the development of substantial fuel loading as the result of fallen fire-killed vegetation render many of these sites impractical to manage. An additional 2,690 acres is scheduled for reforestation on the Salmon Complex and fires within the Westside Fire Recovery project in FY 2016. The Little Deer Fire is scheduled for planting in FY 2017.

Other Monitoring Efforts – Loss of trees to wildfire

Region 5 annually tracks the acreage where trees have been lost to wildfires, concentrating on fires that burn more than 1,000 acres of National Forest System forestland. There were four fires (or complex's) in this size category on the Klamath National Forest in FY 2014, the Beaver Fire, Little Deer Fire, Happy Camp Complex, and the July Complex. A summary of past monitoring efforts is located on the web at <http://www.fs.usda.gov/detailfull/r5/landmanagement/resourcemanagement>.

## Fire Management

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**Objective:** Primary objective is to meet Fire Fighter Line Production Capability, and to assure there is compliance of the initial attack's 90th percentile objective.

**Methodology:** The Forest analyzed the number of fire starts and escapes.

**Results:** The first fire on the Forest in FY 2014 was a human-caused fire on October 10, 2013.

The first lightning fires of the year occurred on June 2, the first of a series of storms that ignited several large fires on the Klamath beginning on July 29 and continuing through August 12, 2014. The number of fires decreased from 158 in FY 2013 to 148 in FY 2014. Of the 148 fires in FY 2014, 126 began with lightning and 22 were human-caused.

The total number of acres burned on the Forest in FY 2013 was 208,013. Of this, 207,986 acres were burned from lightning-caused fires and 27 were burned from human-caused fires.

Weather conditions on the Forest for the FY 2014 season were dry with temperatures exceeding 100 degrees Fahrenheit for one day and precipitation 50 percent of the norm (for the Brazie Ranch remote automated weather station, approximately two miles southeast of Yreka, California. Lightning storms were intense at times, and many were not accompanied by significant amounts of precipitation.

**Large Fire Activity:** The Little Deer Fire, Beaver Fire, July Complex (Whites and Log Fires) were lightning-caused wildfires that started on July 30, 2014. Fires within the Happy Camp Complex (19 fires) were also lightning caused and started on August 11. The Little Deer Fire started on the east side of the Klamath National Forest. Because the terrain there is relatively flat and road accessible, the Forest Service was able to contain the fire at about 5,500 acres. Conversely, the other large fires all occurred on the western portion of the Klamath National Forest, where steep and inaccessible terrain made containment efforts extremely challenging. These fires became long duration events which ultimately burned approximately 203,000 acres under long-term drought conditions. The most challenging group of fires to suppress was the Happy Camp Complex of fires, and containment on the complex was not achieved until October 23, 2015.

Fires within the Happy Camp Complex were ignited by lightning near the town of Happy Camp, California, which is located on the middle portion of the Klamath River. Hot, dry, and windy conditions caused three of the original 19 fires to escape containment, burn actively for several weeks, and eventually growing together and spreading south along the Scott River and into the Marble Mountain Wilderness. The Beaver Fire occurred on the north side of the Klamath River about 30 miles east of Happy Camp, California and eventually consumed approximately 32,000 acres. The July Complex was comprised of the Log and Whites Fires, which burned approximately 37,000 acres southeast of Fort Jones, California. The

July Complex burned both private and National Forest System land, and ultimately spread into the Marble Mountain Wilderness and into the drainage of the North Fork of the Salmon River.

In addition to burning through the Klamath and Salmon River drainages, the fire area (over 200,000 acres) directly impacted dozens of other tributaries throughout the western Klamath National Forest in the Klamath, Salmon, and Scott River systems. All the large fires of the 2014 season burned with mixed severity, meaning there was a mosaic of light, moderate, and severely burned forests within each fire. Of the approximately 203,000 acres that burned on the western Klamath National Forest, approximately 25 percent exhibit very high vegetation burn severity effects. Most trees within high severity burn areas are expected to die. Approximately 35 percent of the fire areas burned with moderate severity, and a substantial portion of those trees have been killed by fire, and surviving trees are expected to experience high mortality due to fire injury, insects, and the effects of prolonged drought. Continued low levels of rain and snowfall this winter in Northern California are worsening drought conditions, and will decrease survivability of fire damaged trees, even in areas that burned in lower severity.

**Further Action Required:** No further action is required. Planning for the Westside Fire Recovery Project is ongoing.

#### **A. Prescribed Fire and Fuels Management Program**

**Objectives:** Determine effectiveness of prescribed burn program in reducing wildfire effects. Monitor conditions of fire severity within a range of vegetation types.

**Monitoring and Results:** The following target was accomplished in fuels for FY 2014. As depicted below, the majority of the target was met through a unified Forest effort. These treatments included low-severity wildfire acres claimed as treatment, thinning, whole tree yarding, prescribed burning, piling, chipping, etc.

For FY 2014, the assigned Forest target for hazardous fuels reduction was 11,207 acres. The Forest exceeded target, accomplishing 39,750 acres. Of the accomplished target, 48 percent (19,182 acres) was met through claiming low severity wildfire acres as treatment, seven percent (2,860 acres) was met through prescribed burning (i.e. pile burning and underburning), and approximately 45 percent (17,708 acres) was met through a variety of other treatments, including thinning, piling, yarding, chipping, etc. Of the Forest treatments accomplished, approximately 50 percent were located within areas considered as Wildland Urban Interface.

**Further Action Required:** No further action is required.

#### **B. Other Monitoring Efforts - Fire Ecology**

The Forest, in coordination with the Humboldt State University, is currently analyzing post fire effects data collected from fires of the FY 2014 fire seasons. The analysis is looking at fire effects to fire sensitive conifer species in an area that contains the most diverse coniferous forest in the world. Other research includes working with Humboldt State University in looking at vegetation fire effects in areas that have re-burned over the past 20 years. In addition, Pennsylvania State University is looking at inversions interactions with fire severity. Peer reviewed scientific papers are expected from these projects.

The Forest has also completed treatment effectiveness monitoring on numerous projects, including prescribed burns. We are currently using the Firemon-Feat Integration ecological monitoring tool. The

Forest is using this program in order to create a cooperate database for fire monitoring, which will standardize the collection, analysis, and results of Forest monitoring data.

The Forest developed a management strategy for the Sugar Creek Research Natural Area. The Forest is looking into research and monitoring opportunities for this area, which contains the most diverse coniferous forest in the world.

## Range Management

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### A. Range Health

**Objective:** Determine vegetative ecological condition and trend.

Range health and forage availability are monitored through a combination of methods that look at utilization, riparian condition, and vegetative trend. Monitoring methods include Landscape Appearance, Best Management Practices, Multiple Indicator Monitoring, Comparative Yield, Photo Points, Stubble Height, Proper Functioning Condition, and Rooted Frequency. All these methods were used to evaluate conditions on key areas (sites that represent allotment conditions, or are indicators of a specific habitat type, such as riparian reserves). In FY 2014 two new frequency plots were installed, one on the Oak Knoll Ranger District and one on the Scott River Ranger District. Ten frequency plots were reread; four on the Oak Knoll District, one on Scott River, and five on the Goosenest Ranger District. One new Multiple Indicator Monitoring plot was installed on the Oak Knoll Ranger District. Best Management Practices Effectiveness Program evaluations were conducted on four allotments.

**Results:** Range health (ecological condition) on permitted allotments is generally good, with a stable or upward trend on most sites.

**Further Action Required:** No further action is required.

### B. Permitted Animal Unit Months

**Objective:** Compare permitted to Forest Plan projected Animal Unit Months (AUMs).

**Methodology:** The Forest Plan projected that the Forest would support 34,000 AUMs. Actual use is tracked by billing documents and allotment inspections.

**Results:** Permitted use was 20,677 AUMs with an actual use of 19,056 AUMS.

**Further Action Required:** The Forest needs to complete environmental analyses on several vacant allotments prior to permitting additional AUMs in order to bring the permitted or actual use closer to projected Forest Plan levels.

### C. Wild Horse Management

**Objective:** Determine number of wild horses and territory expansion.

**Methodology:** None conducted. Population numbers are estimates based on observation, with adjustments made using knowledge of history of herd dynamics and removal efforts.

**Results:** Current estimates are 105 head for McGavin Peak (target of zero animals) and 20 for Three Sisters (target of 20 animals). No horses were removed in FY 2014.

**Further Action Required:** Removal of horses to meet target populations is subject to availability of funding and scheduling with the Department of Interior, Bureau of Land Management.

#### **D. Riparian Health**

**Objective:** Assure Annual Operating Instructions contain riparian objectives and Forest Plan standards and guidelines are being met.

**Methodology:** Allotment Management Plans, Grazing Permits, and Annual Operating Instructions were reviewed to determine whether Aquatic Conservation Strategy and Riparian Health objectives have been included.

**Results:** All documents reviewed had satisfactorily incorporated guidelines to address Aquatic Conservation Strategy and riparian health objectives.

**Further Action Required:** No further action is required.

#### **E. Forage Availability**

**Objective:** Determine compliance with Forest Plan standards and guidelines for forage utilization.

**Monitoring:** The Forest has a total of 47 allotments, of which 37 were active in FY 2014. Of the active allotments, 145 key areas and four non-key areas were monitored on 35 different allotments

**Results:** Of the 149 monitored areas, 143 met resource standards. Resource standards were not met on six individual plots on six allotments. Annual Operating Instructions compliance was met on 31 of the 37 active allotments. In each case, a Forest Service range specialist met with the permittee to resolve the situation. Annual Operating Instructions were adjusted in all cases.

**Further Action Required:** No further action is required.

#### **F. Implementing Range Project Decisions**

**Objective:** Ensure that Range Project Decisions include standards and guidelines and that the standards are implemented.

**Monitoring:** The Forest initiated project-level analysis on two allotments during FY 2013; decisions are anticipated in FY 2015.

**Results:** Two projects are pending decisions. Decisions will incorporate Forest Plan standards and guidelines. To date, the Forest has completed analyses and made decisions on 35 of 45 allotments, all of which have incorporated Forest Plan standard and guidelines into the Allotment Management Plans and Annual Operating Instructions.

**Further Action Required:** No further action is required.

#### **G. Noxious Weeds**

See the *Noxious Weeds* section of this report for information.

**Table 6: Forest Range Monitoring Data Summary for FY 2014<sup>13</sup>**

Allotment Name	# of Key Areas	# of Key Areas Monitored	# of Non-Key Areas Monitored	Monitoring Method	Cooperative Monitoring Plan w/ Permittee Y or N	Data Source	# Met Standards	# Not Meeting Standards	Results shared w/ Permittees Y or N	Permittee cooperation Y or N	AOI Compliance Y or N	Actions Taken or Remarks
Ball Mountain-Kuck's	7	7	0	LA-7	N	FS	6	1	Y	Y	N	AOI will be changed for 2015
Bogus	4	4	0	LA-3,	N	FS	4	0	Y	Y	Y	Copy of report shared w/permittee
Bray	8	8	0	LA-8	Y	FS,P	8	0	Y	Y	Y	AOI will be changed for 2015
Butte Valley NG	17	13	0	LA-17	N	FS	13	0	Y	Y	N	Copy of report shared w/permittee
Deer Mountain	5	5	0	LA-5	N	FS	5	0	Y	Y	Y	Copy of report shared w/permittee
Dry Lake	6	6	0	LA-6	N	FS	6	0	Y	Y	Y	Copy of report shared w/permittee
East Red Rock	11	11	0	LA-11	N	FS	11	0	Y	Y	Y	Copy of report shared w/permittee
Haight Mountain	8	8	0	ST-2,L A-6,	N	FS	8	0	Y	Y	Y	Copy of report shared w/permittee
Horsethief	8	8	0	ST-1,L A-7	N	FS	8	0	Y	Y	Y	Copy of report shared w/permittee

<sup>13</sup> The information presented in Table 3 is summary data (only) from a larger data set. Acronyms are defined as follows: # (number), AOI (Annual Operating Instructions), CY (Comparative Yield), FS (Forest Service), G24 (Best Management Practices Effectiveness), LA (Landscape Appearance Herbaceous), LAB (Landscape Appearance Browse), MIM (multiple indicators monitoring), N (no), P (permittee), ST (Stubble Height), Y (yes), and N/A (not applicable).

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Allotment Name	# of Key Areas	# of Key Areas Monitored	# of Non-Key Areas Monitored	Monitoring Method	Cooperative Monitoring Plan w/ Permittee Y or N	Data Source	# Met Standards	# Not Meeting Standards	Results shared w/ Permittees Y or N	Permittee cooperation Y or N	AOI Compliance Y or N	Actions Taken or Remarks
McGavin Peak	4	4	0	LA-4	N	FS	4	0	Y	Y	Y	Copy of report shared w/permittee
Mount Hebron	3	3	0	LA-3,	N	FS	3	0	Y	Y	Y	Copy of report shared w/permittee
Orr Lake	6	6	0	LA-6,	N	FS	5	1	Y	Y	Y	Copy of report shared w/permittee
Panther/Ball Mtn	8	6	0	LA-8,	N	FS	6	0	Y	Y	N	AOI will be changed for 2015
Red Rock	5	5	0	LA-5	N	FS	5	0	N/A	N/A	N/A	Copy of report shared w/permittee
Shafter	6	6	0	LA-6	N	FS	6	0	Y	Y	Y	Copy of report shared w/permittee
Three Sisters	8	8	0	LA-7	N	FS	8	0	Y	Y	Y	Copy of report shared w/permittee
Ash Creek	0	0	0	N/A	N	FS	N/A	N/A	Y	N/A	N/A	Partial non-use.
Big Flat	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	VACANT
Big Meadows	2	2	0	LA-1, CY-1, MIM	Y	P, FS	2	0	Y	Y	Y	
Big Ridge	6	6	0	OC-6	Y	P, FS	6	0	Y	Y	Y	Faulkstein fire burned through allotment.
Boulder Creek	4	2	0	LA-2, LAB-2, G24-1	N	FS	2	0	Y	Y	Y	

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Carter Meadows	4	2	0	LA-2, LAB-2, G24-1	N	FS	2	0	Y	Y	Y	
Cuddihy	3	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	VACANT
Deadwood	0	0	0	N/A	N	FS	N/A	N/A	Y	Y	Y	
Dry Lake (west-side)	3	1	0	LA-1	N	FS	1	0	Y	Y	Y	Beaver Fire affected half of allotment.
Eagle Creek	4	2	0	LA-2, LAB-1	N	FS	1	1	Y	Y	N	AOI will be changed for 2015
East Beaver	4	3	1	LA-3, LAB-1, OC-1, MIM	N	FS	4	0	Y	Y	Y	Partial non-use
East Fork	2	1	0	LA-1, CY-1	N	FS	0	1	Y	Y	N	AOI will be changed for 2015
Etna Creek	3	2	0	LA-2, CY-1	N	FS	1	1	Y	Y	N	AOI will be changed for 2015
Granite/Fox	3	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	VACANT
Grouse Creek	2	1	0	LA-1	N	FS	1	0	Y	Y	Y	Permittee was called to move cattle, AOI will be changed for 2014
Hornbrook	0	0	0	N/A	N	FS	N/A	N/A	N/A	Y	Y	
Horse Creek	3	1	0	LA-1	N	FS	1	0	Y	Y	Y	

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Allotment Name	# of Key Areas	# of Key Areas Monitored	# of Non-Key Areas Monitored	Monitoring Method	Cooperative Monitoring Plan w/ Permittee Y or N	Data Source	# Met Standards	# Not Meeting Standards	Results shared w/ Permittees Y or N	Permittee cooperation Y or N	AOI Compliance Y or N	Actions Taken or Remarks
Indian Creek	1	1	0	LA-1	N	FS	0	1	Y	Y	Y	AOI will be changed for 2015
Kidder Creek	3	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	VACANT
Lake Mountain	1	1	1	LA-2	N	FS	2	0	Y	Y	Y	
Little North Fork	4	1	0	LA-1	N	FS	1	0	Y	Y	Y	
Marble Valley	2	1	0	LA-1	N	FS	1	0	Y	Y	Y	
Middle Tompkins	4	0	0	N/A	N/A	FS	0	0	N	N/A	N/A	VACANT
Mill Creek	4	3	0	LA-3, LAB-1, MIM	N	FS	3	0	Y	Y	Y	
Red Rock Valley	3	1	0	LA-1	N	FS	1	0	Y	Y	Y	
S. Klamath	2	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	VACANT
Seiad Johnny	2	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	VACANT
Shackleford	4	4	1	LA-4, MIM,	N	FS	5	0	Y	Y	Y	
Shelly Meadows	3	1	0	LA-1, MIM	N	FS	1	0	Y	Y	Y	
South Fork Saloon	4	0	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	VACANT
South Russian	3	1	1	LA-2	N	FS	2	0	Y	Y	Y	Whites fire burned through parts of allotment
<b>Total</b>	<b>201</b>	<b>145</b>	<b>4</b>		<b>3</b>		<b>143</b>	<b>6</b>	<b>37</b>	<b>37</b>	<b>31</b>	

# Noxious Weeds

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**Objective:** Determine if noxious weeds have increased to damaging levels.

The Klamath National Forest noxious weed and non-native invasive plant program follows National direction with six main emphasis areas.

## A. Early Detection/Rapid Response

**Methodology:** The Forest list contains 45 noxious weed species, 30 of which are high priority species for control. Even small levels of weeds are a concern, as they increase very rapidly, and then become uncontrollable. The Forest strategy focuses on treating high priority weed species in high priority places before they get to damaging levels, where possible with limited funding.

Early detection and rapid response prevention practices are implemented. The Forest continued high priority treatments of the few noxious weed species known to exist within Wilderness on the Forest. The Forest prioritized treatment of infestations outside Wilderness by considering factors such as species, proximity and dispersal ability to Wilderness, State ratings of species, and the ability to be successful with the available methods.

In 2014, Burned Area Emergency Rehabilitation funds provided for early detection and rapid response in the areas burned and disturbed by suppression activities in 2013 on the Salmon and Ukonom Ranger Districts.

**Results:** Our Watershed Council partners have been instrumental in locating new infestations in their respective watersheds. New infestations of *Centaurea maculosa*), Spotted Knapweed, and *Euphorbia oblongata* (oblong spurge), were found as a result of surveys in burned areas. These new infestations are being actively treated by partners and Forest staff.

**Further Action Required:** None required. Current protocols of early detection and rapid response will continue.

## B. Inventory/Control/Management

**Methodology:** In FY 2014, there was mainly one person who inventoried and treated weed species by hand, non-chemically, based out of Yreka; and a crew of one, plus a watershed council partner that conducted inventory and treatment in burned areas funded by Burned Area Emergency Rehabilitation. The Forest also has a small dedicated force of employees that contribute in many substantial ways to the weed treatment program. This cadre includes: District Botanists, a small Youth Conservation Corps crew at Goosenest and Salmon/Scott River Districts; a very active river ranger and volunteers at Happy Camp that treat river corridors; fire crews, especially Crew 4 Salmon River Hotshots, and range and recreation technicians. The Forest also has community partners: the Salmon River Restoration Council, the Mid-Klamath Watershed Council, Siskiyou County School groups, volunteers from USFWS and the Natural Resource Conservation Service, and the Siskiyou Satellite of the California Conservation Corps in Yreka. We also work closely with the Siskiyou County Department of Agriculture for treatment on private lands adjacent to the Forest. In 2014, the Klamath National Forest received acknowledgement for actively seeking funding through Burned Area Emergency Rehabilitation for the treatment of weeds on private lands that had the potential to affect Forest lands severely burned.

Effectiveness of treatment methods is measured on the first visit to the site the year following treatment, and then throughout the season on return visits. This evaluation is entered into the national natural resource database.

**Results:** In FY 2014, the Forest and its partners treated 775 acres of 21 different species, on over 261 sites in high priority areas that included burned areas, trailheads, river accesses, Wilderness, roads leading into Wilderness, watersheds with few infestations to date, small satellite sites away from main river corridors, and larger infestations of “A” rated weeds that carry mandatory eradication direction from the State. Some species, like spotted and diffuse knapweed are still present in moderate to low amounts, but do not appear to be spreading from known sites, and are considered under control on the Klamath National Forest. Approximately 21 percent (164 acres) were accomplished using volunteer efforts. *Isatis tinctoria* (dyer’s woad) continues to spread throughout the forest, along roads, river corridors, and anywhere there is disturbance (e.g. fire, timber harvest, mastication, or any activity that creates large openings in the canopy). Yellow starthistle is also quite prevalent in hotter, drier sites. Scotch broom is prevalent along the Klamath and Lower Scott watersheds. These species are only treated in geographically prioritized areas since they are so common on the Forest.

**Further Action Required:** No further action is required. The Forest plans to continue with current treatment and monitoring efforts.

### C. Project-level monitoring and treatment

**Methodology:** Project level monitoring and treatment, if possible, is conducted within three years of project completion. Some areas, depending on the project, are monitored annually dependent upon risk factors and types of disturbance. All projects have project design features that intend to limit the risk of introduction and spread of invasive species.

**Results:** Some highlights of specific projects:

- Big Ridge Grazing allotment: Treatment has been occurring at South Fork Kelsey Meadows and Bear Lake for many years. Dyer’s woad has been steadily declining, especially since follow-up visits were instituted in the late-summer in order to capture re-sprouts and seeding. The Kelsey Meadows group of sites can be treated in one day by five people now; the Bear Lake site is also a day trip for two to four people. In FY 2014 there were fewer rosettes than previous years, indicating a diminishing seed bank. It may be possible to monitor progress now by counting individual plants since the infestations are so small.
- Salmon Salvage: project design features were implemented successfully; Burned Area Emergency Rehabilitation surveys conducted in burned areas that were not included in harvest units due to known seed banks of spotted knapweed confirmed that fire scarifies the seed bank, causing a flush of germination of new seedlings. Treatment of these areas was conducted through Burned Area Emergency Rehabilitation funding.
- Juniper Flat OHV Play Area: no weeds have been introduced to this area as a result of improvement to the site. The bulletin board is posted with flyers about how to minimize the transport of weeds on ATVs and OHVs.

**Further Action Required:** No further action is required. Continuing monitoring and treatment in project areas is planned.

#### **D. Educational Outreach and Prevention**

**Methodology:** As an integral member of the Siskiyou County Weed Management Area group, the Forest has participated in numerous outreach events and has led an educational booth at the Siskiyou County Fair every year since 2001. The 2014 fair booth reached 897 people. Project design features that focus on the prevention of weed introduction and spread are included in every project.

**Results:** Outreach and education events have been successful, measured by the number of new species reported for the County. Prevention measures prescribed for areas where weeds have yet to be introduced have been successful. Preventing the spread of existing weeds has proven to be much more of a challenge.

**Further Action Required:** No further action is required. The Forest plans to continue with current efforts and expanding efforts where possible.

#### **E. Restoration and Rehabilitation**

**Methodology:** Since the Forest does not have extensive weed sites that need human intervention once the target weeds have been removed, most of the time native species return naturally following weed removal. Occasionally, as in the case of fire rehabilitation, native perennial grass seed is used to occupy bare sites. In FY 2014 (October, 2013), native perennial grass seeding was implemented on Yellow Jacket Ridge in tractor fire lines in an attempt to deter the invasion of dyer's woad, known to be close by.

**Results:** In FY 2014, the Forest monitored about 80 percent of weed treatment sites. The natural recovery of grasses and forbs on Yellow Jacket Ridge made it impossible to determine the success of seeding. All the grasses and vegetation blended together perfectly.

**Further Action Required:** No further action is required. The Forest will continue eradicating small sites of selected species and holding, controlling, or decreasing the populations of other priority species at known, selected sites.

#### **F. Strategic planning**

**Methodology:** Efforts were conducted at national, State, and local levels.

**Results:** At the national level, the Invasive Species Strategy and Implementation Plan of 2004 has been updated. The Forest Service National Strategic Framework for Invasive Species Management, August 2013, is now the current direction. This document is available here:

<http://www.fs.fed.us/publications/invasive/invasive-framework-2013.pdf>

At the State level, the State-wide weed mapping project implemented cooperatively with the California Invasive Plant Council and partners, funded by USDA State and Private Forestry resulted in prioritized eradication targets for Siskiyou County. The Klamath National Forest and Weed Management Area Partners are currently writing grant proposals to fund these eradication targets. The North Central Eradication Plan, which includes the Klamath National Forest and Siskiyou County, is available on-line at <http://calweedmapper.calflora.org/regions/>.

**Further Action Required:** No further action is required. The completion of a forest strategy, and adoption of prevention Best Management Practices are planning goals. We will also continue our efforts to build partnerships and find opportunities for outside funding sources to support the program.

## Cultural Resource Management

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**Monitoring Objective:** The purpose of monitoring is to identify effects to heritage resources and provide appropriate mitigation in the event that effects are adverse. It is extremely important that adverse effects to significant sites are recognized and mitigated before the sites lose the information and integrity that makes them eligible for the National Register of Historic Places. Monitoring also aids in determining whether mitigation measures are working to address adverse effects and stabilize sites.

**Monitoring:** Site monitoring is a necessary component of the process required to comply with Section 106 of the National Historic Preservation Act. As part of the project review process, previously recorded historic properties within the Area of Potential Effect are identified and monitored for past effects as well as to identify any potential effects that may occur as a result of project implementation. Site monitoring is also required under Section 110 of the National Historic Preservation Act as part of a pro-active heritage program. Sites are monitored to assess current conditions, identify past or on-going effects and to determine appropriate mitigation measures. Monitoring information can also be used to update site records and assist in the nomination of the site to the National Register.

**Results:** Approximately 39 sites were monitored last year to identify effects from project implementation, environmental conditions, OHV use, wildland fire and fire suppression activities and looting. Monitoring data gathered from these sites aided the Forest in providing information during consultation with the State Historic Preservation Officer and interested Tribal officials. This information was also used to update site records, assess National Register of Historic Places eligibility and develop mitigation. Monitoring related to project planning and implementation (Section 106) occurs for every project the Forest develops. Monitoring completed in compliance with Section 110 has increased due to a greater focus on non-project related accomplishments and appropriate budget allocations. The Forest continues to meet Heritage program objectives and targets established by the Region.

**Further Action Required:** Continue updating the heritage database with monitoring information. Monitor more sites for Section 110 compliance.

## Planning

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### A. Forest Plan Modeling

**Objective:** Validate assumptions used in the Forest Plan to predict impacts to resource programs including visual, wildlife, and earth sciences.

**Monitoring, Results, & Future Action Required:** See preceding discussions for each resource area or program, including *Visual Resource Management*, *Wildlife*, *Geology*, *Soils*, *Water Quality*, and *Air Quality*.

### B. Program and Budget

**Objective:** Determine actual costs associated with implementing planned management prescriptions as

compared with costs estimated in the Forest Plan

**Methodology:** Forest budget and annual budget projections are tracked.

**Discussion:** The economic analysis for the environmental impact statement for the Forest Plan focused on the impact of each alternative on the Present Net Value (the estimate of the market value of forest resources after all costs have been subtracted). Program budgets have fluctuated according to a variety of Congressional laws and earmarks, and court requirements (Northwest Forest Plan, Herger-Feinstein Act, Lake Tahoe Deliverables, Southern California Forest Plan revisions, Northwest Forest Plan Settlement Agreement, Fire Transfer, etc.). A recap of the Forest budget indicates that, since 1995, most resource program budgets have been stable or declining, with timber management fluctuating between high and low points, fire stabilizing after several years of expansion, and fuels declining, like most other resources.

**Further Action Required:** No further action is required.

### C. Other Monitoring – Outputs of Timber Harvest and Fuels Treatments

**Objective & Monitoring:** Compare the acres of timber harvest and fuels treatments, as modeled for the Forest Plan, with actual accomplishments on an annual basis.

**Results:** In the Forest Plan, timber harvest from regulated lands was modeled at an average of 51 million board feet (7.6 million cubic feet) per year over the first decade (1995-2004). This amount of timber harvest was intended to be accomplished on only 4,040 acres primarily using green tree retention prescriptions to accomplish this goal. However, since 1998, timber harvest has been achieved primarily through thinning instead of green tree retention methods. As a result, the intensity of timber harvest treatments has been reduced, and treatments are required over a larger amount of acres to achieve the same volume of timber removal. Since the Forest Plan was approved, the Forest has achieved or exceeded its annual FY timber target seven times (1996, 1997, 2009, 2010, 2011, 2012, 2013, and 2014). For FY 2014, the Forest offered and awarded about 33,987 hundred cubic feet of timber and convertible products in FY 2014. This exceeded the assigned target of 19,600 hundred cubic feet by about 57 percent.

The Forest Plan modeled timber harvest from unregulated lands (where trees are harvested solely to achieve goals of ecosystem health) at about 6,000 to 12,000 acres per year, while unregulated lands are not programmed and are generally incidental. During FY 2013, commercial harvest from unregulated lands was from about 3,067 acres.

See the *Timber Management* section of this report for more information.

The Forest Plan modeled fuels treatments at about 27,000 acres per year, including 9,375 acres of prescribed burning, 3,183 acres of timber-related treatments, and 14,550 acres of other fuels treatments (e.g. mastication). For FY 2014, the assigned Forest target for hazardous fuels reduction was 11,207 acres. The Forest exceeded the target, accomplishing 39,750 acres. Of the accomplished target, 48 percent (19,182 acres) was met though claiming low severity wildfire acres as treatment, seven percent (2,860 acres) was met through prescribed burning (i.e. pile burning and underburning), and approximately 45 percent (17,708 acres) was met through a variety of other treatments, including thinning, piling, yarding, chipping, etc. Of the Forest treatments accomplished, approximately 50 percent were located within areas considered as Wildland Urban Interface. See the *Fire Management—Prescribed Fire Program* section of this report for more information.

**Further Action Required:** Annual comparisons will be continued for FY 2015.