



United States  
Department of  
Agriculture

Forest Service

Pacific  
Northwest  
Region

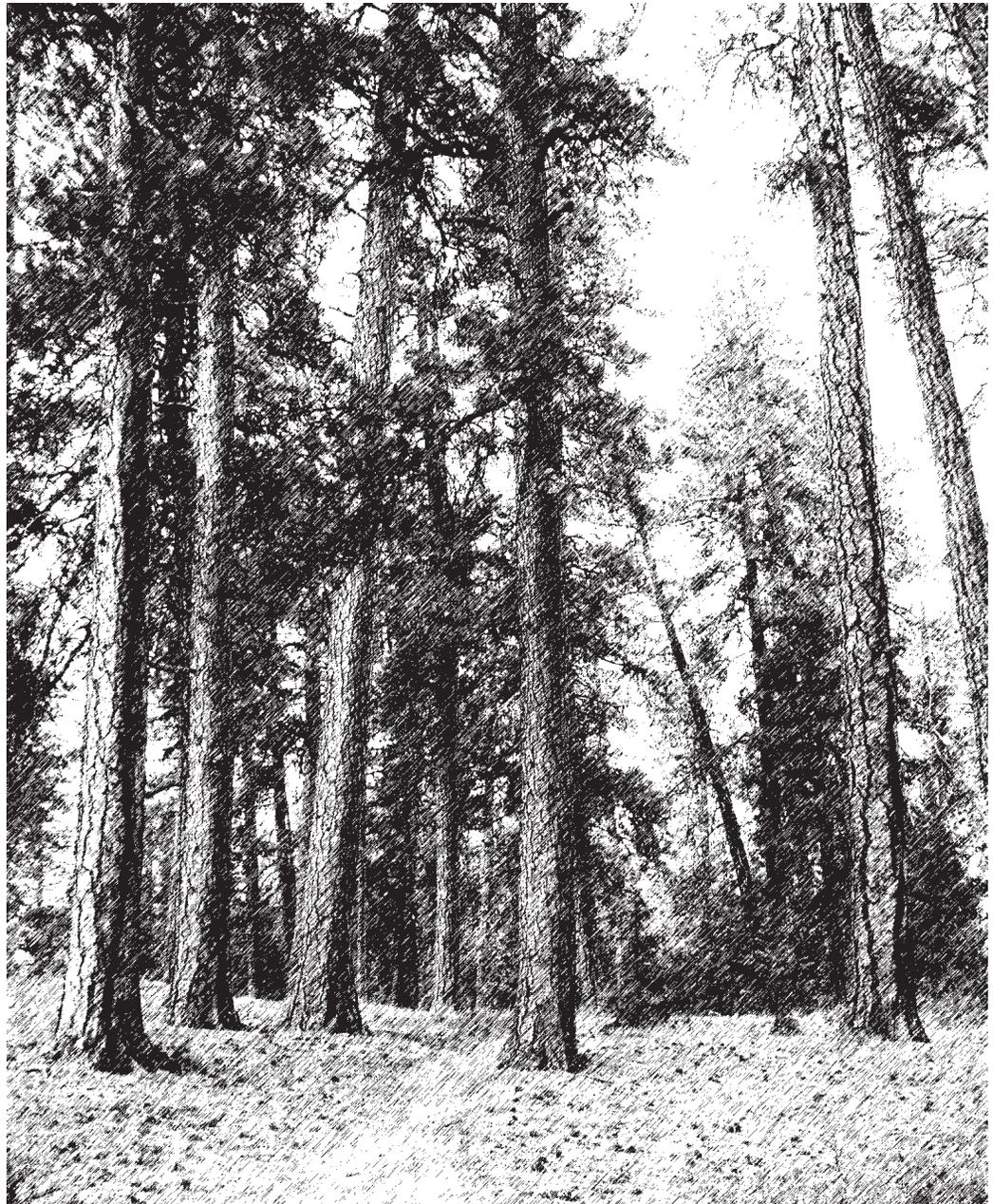
Wenatchee  
National  
Forest

November 2012



# Annual Report on the Wenatchee Land and Resource Management Plan

## Implementation and Monitoring for Fiscal Year 2010



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# I. INTRODUCTION

## PURPOSE OF THE MONITORING REPORT

The Wenatchee Forest Plan was implemented in 1990 after extensive analysis and public review and comment. The Forest Plan was then amended in 1994 by the Northwest Forest Plan. Preparation of the Forest Plan is required by the National Forest Management Act of 1976. It provides standards, guidelines, land allocations, and philosophy which serve as the basis for all Forest Service management on the 2.2 million acre Wenatchee National Forest (Wenatchee NF).

The purpose of this annual report is to provide information to the Regional Forester, Forest Leadership Team, and the public on how well the *Forest Plan* objectives are being met. The monitoring and evaluation process will provide information to determine if:

laws, regulations, and policies are being following, including those found in the Forest Plan Management Area Prescriptions, and Forest-wide Standards and Guidelines, the Regional Guide, and Forest Service Handbooks.

the management prescriptions are producing the predicted Goals and Objectives or Desired Future Conditions of the Forest environment.

cost and annual budgets of implementing the Forest Plan are within projected limits.

the projected range of outputs is being produced; it will also evaluate effects.

A number of monitoring systems are already in place to comply with administrative and legal responsibilities. *Forest Plan* monitoring does not replace these systems, but rather complements them by addressing specific issues and concerns identified through the planning process.

## GENERAL INFORMATION

Monitoring consists of gathering data, making observations, and collecting and disclosing information. Monitoring is also the means to determine how well objectives of the *Forest Plan* are being met, and how appropriate the management Standards and Guidelines are for meeting the projected Forest outputs and protecting the environment. Monitoring is used to determine how well assumptions used in development of the *Forest Plan* reflect actual conditions.

Monitoring and evaluation may lead to changes in practices or provide a basis for adjustments, amendments, or *Forest Plan* revisions. Monitoring is intended to keep the *Forest Plan* dynamic and responsive to change and new information.

## II. SUMMARY OF THE RECOMMENDED ACTIONS

The following categories of actions are used to summarize those monitoring items needing attention from the Forest Supervisor and Forest Leadership Team. Group Leaders responsible for each monitoring item have recommended actions based on their evaluations.

### **Results are Acceptable/Continue to Monitor**

The results for these monitoring questions are either acceptable (within the ‘Threshold of Variability’ listed in Chapter V of the *Forest Plan*), or more than 1 or 2 years of data is needed to evaluate the results (continue to monitor). For some items, several years of data collection is necessary to evaluate the effectiveness or validity of the *Forest Plan*. Studies are being initiated to provide the baseline data and inventories necessary to answer these questions.

### **Change Management Practices**

The results for these monitoring questions exceed the ‘Threshold of Variability’ for a particular monitoring item question in Chapter IV. An evaluation of the situation indicates the need to change practices to comply with the *Forest Plan*.

### **Further Evaluation/Determine Action**

The results for these monitoring questions may or may not exceed the ‘Threshold of Variability’. Additional information is needed to better identify the cause of the concern and to determine future actions.

	Continue Monitoring	Management	Evaluation	Amendment	Recommendations
<b>RECREATION</b>					
Recreation Opportunity Spectrum	●				Continue monitoring as scheduled
Forest Trails	●				Continue efforts to address the deferred maintenance on trails.
Management of Developed Recreation	●				Continue monitoring as scheduled.
<b>SCENERY MANAGEMENT</b>					
Scenic Resource Objectives	●				<p>Continue working with the Department of Transportation and permittees to minimize signs and structures, and for roadside improvements.</p> <p>Renew the special use agreement with WSDOT to replace all guardrails with the weathering steel type to blend in with the landscape character more fully. In future slope stabilization projects utilize landscape architecture design elements to blend the project into the existing landscape and maintain a high level of scenic quality.</p> <p>Continue working with White Pass Ski Company to improve signs, landscaping, and color scheme.</p>
Landscape Character Goals	●				Continue to monitor as scheduled, priority areas are projects in Special Places and Areas of High Scenic Concern.
<b>WILDERNESS</b>					
Recreation Impacts on Wilderness Resources	●				Continue monitoring social encounters, particularly in popular day use areas. Reconsider standards during Forest Plan Revision (in progress).
<b>WILD, SCENIC and RECREATIONAL RIVERS</b>					
Wild, Scenic And Recreational Rivers	●				Continue monitoring as Scheduled

	Continue Monitoring	Management	Evaluation	Amendment	Recommendations
<b>CULTURAL RESOURCES</b>					
Cultural and Historic Site Protection	●				Continue monitoring as scheduled.
Cultural and Historic Site Rehabilitation	●				Continue efforts as budget allows, to preserve and rehabilitate National Register eligible properties
American Indians and their Culture	●				Continue monitoring as scheduled.
Coordination and Communication of Forest Programs with Indian Tribes	●				Continue to promote notification and communication with tribal entities.
<b>WILDLIFE</b>					
Indicator Species: Primary Cavity Excavators	●				Summarize the monitoring information from 2006 and 2007 to show effects of post-fire timber harvest (10 years post-treatment) on snag attrition and primary cavity excavators.  Survey snags before and after timber harvest to determine if snag standards are being met.  Develop a snag protocol from statistically accurate measurements of snag attrition rates.
Indicator Species: American Marten	●				Disseminate literature to districts to incorporate into project work.  Use the results of the monitoring study to develop a forest monitoring protocol in association with the revised Forest Plan.
Land Birds	●				Research spring burning effects as a tool of restoration for avian focal species (i.e. ground nesting species) with greater sample sizes.  Hold workshops to present the results of these studies and management recommendations to managers and interested publics in 2012.

	Continue Monitoring	Management	Evaluation	Amendment	Recommendations
Threatened and Endangered Species: Northern Spotted Owl	●				<p>Monitoring should include tracking the changes in the availability of suitable spotted owl habitat over time.</p> <p>Continue to monitor &gt;50% of the known spotted owl sites on the Forest in order to track trends in the number of young/site over time.</p> <p>Validate monitoring suitable spotted owl habitat and spotted owl productivity (young/site) to determine trends in the spotted owl population on the Forest.</p> <p>Cooperate with the Wenatchee Forestry Sciences lab to monitor how dry site restoration projects are influencing resource selection by spotted and barred owls.</p> <p>Incorporate the USFWS recovery plan (2008) into the Forest Plan Revision.</p>
Survey and Manage Species: Chelan Mountain snail (Tiny Canyon Mountainsnail)	●				<p>Disseminate recent literature to managers at ranger districts for incorporation into surveys.</p> <p>Continue to survey for Tiny Canyon mountainsnails using the results from the habitat associations study and fire effects study to guide survey priorities.</p>
<b>WATERSHEDS AND AQUATIC HABITATS</b>					
Fish Management Indicator Species (MIS) Populations	●				Continue to monitor these populations
Riparian Watershed Standard Implementation Monitoring	●				Continue a variety of projects as funding and opportunities arise.
WATERSHEDS and AQUATIC HABITATS	●				Continue to monitor temperature and sediment parameters
<b>RANGE HEALTH</b>					

	Continue Monitoring	Management	Evaluation	Amendment	Recommendations
RANGELAND HEALTH	●				<p>Continue to implement utilization monitoring for the active grazing allotments.</p> <p>Continue to develop a monitoring agreement with WDFW on the bighorn sheep herds.</p> <p>Develop a plan to resolve livestock and wildlife concerns on the Cle Elum and Naches Ranger Districts.</p> <p>Coordinate with WDFW to determine forage carrying capacity for livestock and elk, initiate management actions to balance annual forage production with grazing use</p>
<b>INVASIVE SPECIES</b>					
Invasive Species	●				<p>Evaluate use of any new standards above for plan monitoring and implementation as appropriate. Monitor effectiveness of weed free feed/straw regulations and signing that communicates the new regulations to the stock-using public. Monitor the effectiveness of weed free gravel in timber and engineering projects.</p> <p>Establish key/indicator drainages/ areas that can be assessed every 3 years to monitor the status of invasive plants treatments and prioritize watersheds for restoration.</p>
<b>FOREST FIRE PROTECTION</b>					

	Continue Monitoring	Management	Evaluation	Amendment	Recommendations
Forest Fire Protection	●				Results are okay, natural ignitions cannot be controlled. There is a need to increase the number of local Initial Attack resources. There is still a need to pursue investigations of human fire starts in order to determine cause. The Forest continues to have a need for qualified Fire Investigators. The Forest needs to increase the prevention message with regard to campfire use. Escaped campfires still account for a large portion of the statistical fires on the Forest.
Use of Prescribed Fire	●				Work with agency partners on ways to further increase the use of prescribed fire within the Wildland Urban Interface. Continue to work with the regulatory agencies on smoke issues.  Continue to evaluate all natural ignitions in the Wilderness for suitability for meeting multiple objectives. Encourage the development of Modules on the Forest to help manage multiple objective fires, and develop the analytical skills needed for long term risk assessments.

### Propose Forest Plan Amendment

Areas where results are inconsistent with the *Forest Plan* objectives or the *Forest Plan* direction was not clear. The follow-up action requires either changing or clarifying the *Forest Plan* through the amendment process. Non-significant amendments can be made by the Forest Supervisor; significant amendments require Regional Forester approval.

# III. INDIVIDUAL MONITORING ITEMS

## Recreation

Monitoring Item -

### Recreation Opportunity Spectrum (ROS)

The Recreation Opportunity Spectrum (ROS) arranges the possible combinations of activities, settings and probable recreation opportunities across a continuum or spectrum. The goal is to provide a well-balanced array of recreation opportunities across the breadth of the Recreation Opportunity Spectrum in accordance with resource capability, public demand and expectations for outdoor recreation. The monitoring question is:

#### Does the Forest provide a well-balanced array of recreation opportunities?

The Wenatchee National Forest participated in the third round of the National Visitor Use Monitoring (NVUM) studies in 2010. The first and third rounds were conducted in 2001 and 2005, respectively.

The results of the most recent study estimated that there were 1,096,000 Forest visits in 2010, with a plus or minus confidence level of 16.9% (i.e. the use could be 16.9 % more or 16.9% less than the estimated 1,096,000). In 2005, the number of visits to the Forest was estimated at 1,405,000, with a confidence level of plus or minus 31.1%. Due to this variance in confidence levels, it is difficult to compare total estimates of Forest visits between 2005 and 2010.

Regardless of visitor use estimates, results of the study suggest that a range of recreation settings and activities are provided by the Forest and enjoyed by its visitors. The table below shows some of the most representative uses, as well as some of the least representative uses.

Activity	% Participation	% Main Activity
Hiking/Walking	46.5	12.6
Viewing Natural Features	38.0	5.4
Relaxing	36.5	6.9
Viewing Wildlife	33.9	0.9
Driving for Pleasure	28.2	4.9
Downhill Skiing	18.6	17.0
Developed Camping	15.3	9.5
Picnicking	12.2	0.1
Cross-Country Skiing	10.4	8.1
Nature Study	6.5	0.0
Motorized Trail Activity	5.6	3.2
Primitive Camping	5.2	3.5
Resort Use	5.2	2.2
Bicycling	2.7	0.9
OHV Use	2.5	1.1
Backpacking	2.1	1.3

In the past five years, there has been increased interest in developing more mountain biking trails, as well as more technical “terrain parks” or trails with features such as jumps. The Forest has also heard that people would like more day hiking opportunities, and connectivity between trails systems managed by other agencies (such as linking the city of Wenatchee’s Foothill trail system to national forest trails. The Forest’s Travel Management Planning process has illuminated the scarcity of trails for 4x4 vehicles and ATV’s. Those interests are being considered in the analysis process. In addition, a desire for more non-motorized winter recreation opportunities has been expressed by several individuals and organizations.

In summary, the Wenatchee National Forest currently provides a wide range of recreation settings, activities and opportunities all seasons of the year. Travel Management planning and Forest Plan Revision are underway and will help address emerging issues and demands, such as increased motorized and mountain biking opportunities.

Monitoring Item –

## **Forest Trails**

The goal is to manage trails to provide recreation opportunities in a wide range of recreation settings in harmony with other resource management objectives. The monitoring question is:

### **Are trails providing the variety of opportunities intended in the Forest Plan?**

The Wenatchee National Forest currently has approximately 4,300 miles of trails, up from 2,463 miles when the Forest Plan was completed. Although the Forest is providing the variety of opportunities intended in the original Forest Plan, public interest has shifted. There is increasing demand for mountain biking trails, some with technical features (jumps, catwalks, etc.), and there is more demand for ATV and 4x4 trails than we are currently providing. The Forest is currently completing Travel Management planning, in an attempt to provide adequate motorized trail opportunities, while also minimizing cross-country travel and the associated potential for impacts to resource.

Most trails are maintained with a combination of appropriated dollars, grant funds & volunteers. Appropriated dollars provide the smallest contribution of these sources. The Forest Plan said we would “maintain all (2,463 miles) of trail each year). Currently, a large percentage of trails are logged out, but some are not maintained annually or even on a regular rotating basis.

Limited funding is available for deferred maintenance, and many trail bridges are reaching or surpassing their life-spans. If these bridges are not replaced, the result could be loss of trail opportunities in the event trails are closed for safety reasons, or visitors may find a very different recreational experience if they have to ford previously bridged waterways. In 2005, deferred maintenance needs were estimated at 4.7 million dollars. That figure has no doubt increased significantly. In the future, the Forest will have to address the size and maintenance standards for the trail system and determine what is reasonably sustainable.

In addition to the summer trail system, the Forest has over 1,000 miles of snowmobile trails, and about 150 miles of cross-country ski trails. Maintenance of winter trails is accomplished primarily through partnerships with the Washington State Parks and Recreation Commission (Snowmobile & SnoPark programs). These funds cover maintenance costs, but not administrative and operational costs for managing the winter trail program. The Echo Ridge Winter Sports area on the Chelan Ranger District is a special fee area that offers a wide range of cross-country ski opportunities, as well as snowshoe and winter hiking opportunities.

Monitoring Item –

## **Management of Developed Recreation Facilities**

The goal is to provide safe, well maintained, developed recreation facilities for the public commensurate with recreation demand. The monitoring questions are:

**Are available developed recreation facilities meeting public demand?**

**Are developed recreation sites, areas and facilities being adequately maintained to serve the public and protect resource values?**

The answer to both of these questions is no, at least to some degree. The Forest has over two hundred recreation facilities. Many facilities are meeting demand, while others are inadequate in size or condition. Facilities receive maintenance throughout the use season, but as with trails, there is a tremendous backlog of deferred maintenance. Many of our facilities were constructed around the same time & are falling into various stages of disrepair at the same time. Of particular concern are worn out or outdated drinking water systems that are difficult & expensive to maintain.

The Forest completed the Recreation Facilities Analysis 2008. This process looked at over two hundred recreation facilities, analyzed and ranked them on the following criteria:

- a) use and conformance with the focus of the Forest recreation program (Forest “niche”)
- b) cost and operational efficiency
- c) effects on environmental sustainability
- d) effects on community stability

This process resulted in a stratification of facilities and regional direction that certain funds would be available only for facilities that ranked in the top 50% of all facilities analyzed. The analysis also resulted in some facilities being recommended for closure and/or obliteration. The Forest receives over one million dollars for Recreation Site Improvement projects (deferred maintenance). Little action has been taken to address facilities recommended for closure.

## **Scenery Management**

Monitoring Item –

### **Scenic Resource Objectives**

The objective is to manage vegetation and facilities, which are consistent with the stated scenic quality objectives for each management area. The monitoring question is:

**Do the cumulative effects of all resource activities within a viewshed meet the desired scenic condition (integrity level) and landscape character? Is the sense of place maintained or enhanced?**

The Okanogan-Wenatchee National Forest landscape architect reviewed projects in three viewsheds to assess the potential cumulative effects of resource activities on scenery over the last five years. The following areas are periodically reviewed: Blewett Pass Highway 97, White Pass Highway 12, and Stevens Pass Highway 2 viewsheds. Scenic resource analyses on these viewsheds indicate that the viewsheds vary from natural appearing to a slightly altered condition on National Forest Lands. Other viewsheds and projects are also reviewed in areas of high or moderate scenic concern.

Blewett Pass Highway 97 is in a natural appearing to slightly altered condition throughout the travel route. Currently, there is a spruce budworm infestation that is very active and changing the landscape character dramatically by turning green trees to brown on a landscape scale. This has been occurring over the last four to five years, but has become very evident in the last two years. The scale of the disturbance is dominating to the evergreen landscape character. Vegetation changes throughout the travel route blend well with the natural diversity of the landscape.

Blewett Pass Highway 97 had a portion of the Liberty Timber Sale (Liberty Wildland-Urban Interface Fuels Reduction Project) implemented in some areas of foreground and middleground near the community of Liberty. The ridgeline view from Liberty was maintained as a natural appearing backdrop setting, with texture and color maintained. Skyline corridors were kept narrow, short and angled away from the direct viewpoints accomplishing the goal of not introducing unnatural lines in the landscape. The vegetation management blends into the existing landscape character and enhances the landscape character by reducing fuels while meeting the Retention VQO with a High scenic integrity level.

Iron Timber sale was implemented in Highway 97 viewshed. The Swauk meadow had thinning activities that enhanced the landscape character by managing encroaching vegetation and doing prescribed burning. The vegetation management activities blend fully into the landscape with no evidence of any timber harvest and maintained a high level of scenic quality. Along Highway 97, scenic integrity changes are seen as a variation of mixture of densities of tree spacial intermixed and blended across the landscape with a more open forested canopy character. The larger diameter trees are more exposed for viewing from the highway highlighting views into the park like stands. The mosaic character of the area met the Retention VQO with a High scenic integrity as viewed from U.S. Highway 97.

Interpretive opportunities were increased with the installation of a 3-sided kiosk with 3 large panels that highlight the history of the Old Blewett Pass Highway. The kiosk structure is located near the Old Blewett Pass Highway on the edge of Swauk Meadow. The kiosk blends into the scenic Swauk meadow setting and the interpretive panels reflect high quality of design. The project was an enhancement to the recreation experience along Highway 97 and contributes to the sense of place for the area.

There have been WSDOT management activities occurring over Blewett Pass Highway 97 including several areas of rock stabilization projects in the rocky canyon on the east end of the highway to installing an extra lane on the west end. The slope stabilization projects meet the intent of Retention with the exception of some shiny bolts that reflect light. There are areas along the Blewett Pass Highway 97 that need to have the weathering steel guard rails installed when the galvanized guard rails are replaced through regular maintenance activities. The installation of communication facilities at Blag Mountain Communication Site was fully successful in meeting Partial Retention VQO and maintaining the high quality scenic setting as viewed from the visually sensitive area as a backdrop setting from U.S. Highway 2/97, from areas within the communities of Leavenworth and Peshastin and several rural residences located along the valley. The project consisted of installing a new 160' charcoal black monopole tower and new larger equipment building at an existing communication site. The color and placement of the tower and building remain visually subordinate. The structure was painted a charcoal black and blends into the background viewing distance from Highway 2/97.

Overall, the scenic integrity of the Blewett Pass Highway 97 viewshed and sense of place is maintained at a high level.

The White Pass viewshed had the Wildcat Timber Sale, (Russell Ridge Vegetation and Fuels Management project) implemented in some areas of the foreground and middleground along the north slope of Rimrock Lake on the Naches Ranger District. The viewshed is in a natural to slightly altered condition throughout the travel route along Highway 12. Vegetation changes throughout this travel route blend well with the natural diversity of landscapes as viewed from the eastern Wenatchee National Forest boundary to the summit of White Pass.

The White Pass Scenic Byway developed recreation site identification signs are being replaced from the old style to a new aesthetically pleasing style specific to the White Pass Scenic Byway. The signs feature a consistent color scheme and are accented with various rock bases and wood work reflective of the Cascadian Architectural style. Wild Rose Day Use site was rehabilitated and developed to be fully accessible with a Cascadian style toilet, picnic sites, asphalt trails and a deck observation point overlooking the Tieton River. Clear Creek Falls Overlook was redesigned and improved by replacing the old chain link safety fencing with a new safety fencing that blends more into the landscape setting. The new safety fencing is black in color which absorbs light and does not have any reflective contrast viewed from Highway 12. These recreation projects improved both the safety and the aesthetics of the facility and were an overall enhancement to the viewshed.

The highway from Rimrock Lake up to White Pass will need to have the weathering steel guard rails installed when the galvanized guard rails are replaced through regular maintenance activities to be consistent with the White Pass Scenic Byway Corridor Management Plan (Design Guidelines, 3-27 and 28). In addition, slope stabilization work has been done on the lower end of the highway by installing safety rock netting. In some areas the safety netting is a shiny galvanized material and there are areas where rock bolts have a reflective surface making the safety netting stand out more than if they had been colored to match the surrounding rock. Future slope stabilization projects will need to incorporate aesthetic design objectives to blend activities into the existing landscape character. Overall, the scenic integrity of the White Pass Scenic Byway viewshed and sense of place is maintained at a high level.

Stevens Pass viewshed is in a natural appearing to slightly altered condition throughout the travel route on NFS Lands. Vegetation changes throughout this travel route blend well with the natural diversity of landscapes as viewed from the Wenatchee National Forest boundary to the summit of Stevens Pass. The Stevens Pass viewshed had part of the Natapoc Ridge Forest Restoration project done that resulted in a mosaic textured pattern viewed near the Tumwater Campground sewage disposal pond and north of Tumwater Campground. Landscape character changes are viewed as thinned out stands of trees and a more open forested canopy character. The larger diameter trees are more exposed for viewing from the highway and views into the park-like stands are enhanced. The mosaic character of the area met the Retention VQO with a High scenic integrity as viewed from along the foreground of the U.S. Highway 2.

A new pedestrian bridge and eastbound right turn lane was constructed at Stevens Pass Ski Area, it was coordinated with the WSDOT and FHA in year 2010. Aesthetic quality was maintained by utilizing the Cascadian Architectural style to design facilities and maintain a rustic look. Concrete was stained and coatings on metal fencing and railing were used to match the adjacent rock found in the area. The project meets a high level of scenic integrity. Several projects were done coordinated with the WSDOT regarding slope and rock stabilization projects in the Tumwater Scenic Canyon. The projects are currently being constructed with the anticipation of meeting a high scenic quality objective as designated for the Tumwater Scenic Canyon. Stevens Pass will need to have the weathering steel guard rails installed when the galvanized guard rails are replaced through regular maintenance activities to be consistent with the

Stevens Pass Scenic Byway design objectives. Overall, the scenic integrity of the Stevens Pass Scenic Byway viewshed and sense of place is maintained at a high level.

Monitoring will continue on these viewsheds as future projects develop.

### **Projects Monitored in Other Viewsheds**

On the Wenatchee River Ranger District, the Mission Ridge Ski Area expanded the lower parking lot. The landscape character changes viewed from Hampton Lodge and the ski runs are predominately seen as an expansion of the existing landform modification in scale to the surrounding landscape setting. The clearing limits were as minimal as possible, large trees were saved, and there were no cut slopes. The project met the Retention VQO and maintained the sense of place for Mission Ridge Ski Area.

Improvements continue to be made on the Cle Elum Ranger District with implementation of the Cle Elum River Floodplain Restoration Phase 2 project. The project is part of the Respect the River program, an approach to protect and restore aquatic habitats while accommodating recreation. Riparian areas are being restored by moving vehicle access out of the floodplains and reducing redundant roads. Recreation sites were redesigned to improve vehicle circulation patterns, provide designated parking and campsites that are more aesthetic and up to standards while maintaining the sense of place for dispersed campers.

### **Recommendations**

#### **Blewett Pass Highway 97 Viewshed**

Maintain and enhance scenic quality while reducing fuels and improving forest health throughout the viewshed.

Continue working with the Department of Transportation and permittees to minimize signs and structures, and for roadside improvements. Renew the special use agreement with WSDOT to replace all guardrails with the weathering steel type to blend in with the landscape character more fully.

Continue to monitor and enhance high scenic quality along the travel route.

#### **White Pass Viewshed**

Continue working with White Pass Ski Company to improve signs, landscaping, and color scheme.

Continue monitoring Highway 12 to maintain the highest possible scenic quality by designing all activities to retain the natural appearing scenery. Vegetation changes and structures along the Highway 12 viewshed should continue to be monitored and enhanced to protect and improve scenic qualities.

Continue working with Washing State Department of Transportation toward functional and aesthetically pleasing structures, safety, and danger tree removal. Renew the special use agreement with WSDOT to replace all guardrails with the weathering steel type to blend in with the landscape character more fully. In future slope stabilization projects utilize landscape architecture design elements to blend the project into the existing landscape and maintain a high level of scenic quality.

## Stevens Pass Highway 2 Viewshed

Continue monitoring Highway 2 to maintain the highest possible scenic quality by designing all activities to retain the natural appearing scenery. Maintain and enhance scenic quality while reducing fuels and improving forest health throughout the viewshed.

Continue working with Washing State Department of Transportation toward functional and aesthetically pleasing structures, safety, and danger tree removal. Renew the special use agreement with WSDOT to replace all guardrails with the weathering steel type to blend in with the landscape character more fully. In future slope stabilization projects utilize landscape architecture design elements to blend the project into the existing landscape and maintain a high level of scenic quality.

Monitoring Item –

### Landscape Character Goals

The objective is to manage vegetation and facilities to be consistent with the stated landscape character goals for the management area so that the landscape character contributes to the cultural elements and reflects the sense of place. The monitoring question is:

**Are related Standards and Guidelines being implemented, and do they achieve stated goals and objectives, particularly scenic character goals?**

The desired future condition for scenery is an ecologically and aesthetically sustainable forest with positive cultural elements. A high degree of naturalness is desirable. Fire restoration and thinning projects to reduce fuels and promote healthy ecosystems have been initiated. This helps achieve a long-term forested environment with a more natural appearing landscape with scattered groups, individual large trees, and varying densities of vegetation patterns and a more open stand. The trend of harvest practices in the last five years has been towards partial cutting and thinning, where trees are left to achieve scenic quality and other resource goals. These practices also reduce the amount of contrast in the viewsheds. The viewsheds are moving to a more natural appearing landscape.

### Recommendations

Continue to monitor as scheduled, priority areas are projects in Special Places and Areas of High Scenic Concern.

# WILDERNESS

Monitoring Item-

## Recreation Impacts on Wilderness Resources

The goal of wilderness management is to preserve and protect the natural character of these areas and provide opportunities for solitude, challenge, inspiration and scientific study. The monitoring question is:

**Is recreation visitor use or management resulting in changes in the physical, biological, or social settings that approach the Limits of Acceptable Change (LAC) Standards specified in the Forest Plan?**

The Forest Plan established Physical-Biological and Social standards, which vary depending on which one of four Wilderness Recreation Opportunity Spectrum (WROS) classes a particular area of the wilderness has been assigned to. The overall guideline is to prevent degradation and maintain or restore natural conditions, recognizing that some change is inevitable due to use, although specific indicators and standards can be applied to monitor & respond to degrees of change (Limits of Acceptable Change).

While the majority of the Forest's wilderness acres provide opportunities for solitude, there are areas with significant day use that exceed standards for solitude (indicated by number of encounters with other parties). The trend of decreasing overnight use and increasing day use continues. Particularly in areas of the Alpine Lakes Wilderness, the number of encounters with others far exceeds the social standards described in the Forest Plan. A permit system limiting day use may be indicated, but needs to be given thorough cost-benefit analysis. Given declining budgets and workforce, such an endeavor may not be feasible. The Forest will continue to monitor this standard.

The Forest Plan also included standards to protect physical/biological resources. Loss of vegetation, damage to trees, exposed tree roots and barren mineral soil ('barren core'), were all identified as indicators of campsite conditions. The Limits of Acceptable Change (LAC) framework was incorporated into the Plan, however, a set of "boiler-plate" standards were adopted without going through one of the key steps of the LAC process, which is an initial inventory and assessment of existing campsites. As a result, the barren core standards identified as acceptable in the Plan are both, much smaller than the size needed for groups camping in wilderness and far smaller than the existing campsites at the time the standards were adopted. Barren core areas of campsites are extremely difficult to restore to natural conditions, and restoration efforts can be only successful if all use can be eliminated.

The combined challenges of effectively eliminating use of numerous campsites, the somewhat arbitrary assignment of quantitative standards and the lack of staff and funding have made it difficult to make much progress in meeting standards, particularly that for campsite barren core. Additionally, more recent research suggests that ineffectively closing campsites (i.e. the inability to ensure that no use occurs) is more likely to result in recurring use of the original sites, as well as creation of new sites by those who are trying to meet the regulations. The revised Forest Plan (in progress, 2011) needs to address wilderness standards using the best available current science.

Noxious and invasive plants were treated in all wildernesses with hand pulling of spot infestations. A noxious weed EIS prepared for the Lake Chelan Sawtooth Wilderness

## Recommendations

Continue monitoring social encounters, particularly in popular day use areas. Reconsider standards in revised Forest Plan (in progress)

## WILD AND SCENIC RIVERS

Monitoring Item-

### Wild, Scenic, and Recreational Rivers

The goal is to retain the character and attributes of rivers recommended for Wild, Scenic, or Recreational designation. The monitoring question is:

**Are resource management activities along recommended river corridors being conducted in a manner to provide protection at the appropriate level of classification?**

There were no projects implemented on the Forest in the past five years that had the potential to affect the classification determined in the *Forest Plan* for recommended rivers. Until Congress acts on the recommendations, the Forest Service will continue to protect these rivers so that the classification requirements are maintained.

## Recommendations

Continue monitoring as scheduled.

## CULTURAL RESOURCES (Heritage Resources)

Monitoring Item -

### Cultural and Historic Site Protection

The goal is to protect heritage resources from vandalism, disturbance from project activities, and natural degradation. The monitoring questions are:

**Are the National Register characteristics of un-evaluated and significant heritage resource properties being protected?**

**Are all reasonably locatable heritage resources being discovered during project area reconnaissance?**

The Heritage Program oversees the Forest's responsibility for compliance with federal laws and regulations governing the management of cultural resources. The program is managed by a Program Manager/Forest Archaeologist/Tribal Relations Coordinator. In 2008 a part-time Assistant Forest Archaeologist position was added. Section 106 compliance work is largely completed by Cultural Resource Technicians on each ranger district who work closely under the direction of the Heritage Program Manager. To keep track of cultural resources on Forest the program maintains several internal databases and in 2010 all data was entered into the Forest Service National database for heritage resources. The Forest continues to work on getting all sites into GIS. Forest archaeologists have access to and often use the GIS database operated by

the Washington State Department of Archaeology and Historic Preservation.

Between 2006 and 2010 the number of Section 106 consultations in accordance with the National Historic Preservation Act ranged from 67 to 106. The annual increase was due largely to the Forest's emphasis on recreational residence tract documentation and evaluation in support of permit reissuance and by an increase in the number of projects such as I-90 East and the US 2 Tumwater Bridge Replacement project by the Washington State Department of Transportation and the Federal Highway Administration; Holden Mine remediation, and implementation of Lake Chelan and Rocky Reach FERC license requirements. Additionally, the Forest was actively engaged in the 2009 American Recovery and Reinvestment Act (ARRA) with several engineering and trail projects.

Section 106 consultation in support of Forest ecosystem restoration, prescribed burning, timber and salvage sales, fish and wildlife habitat improvement, reissuance of grazing allotment permits, recreation improvements at campgrounds, trail reconstruction, disposal and/or conveyance of administrative sites, recreation residence improvements, wildfire suppression and BAER, and major planning efforts associated with Forest Plan revision and Access Travel Management was the major focus of fiscal years 2006-2010. More than half of the projects requiring Section 106 support had little or no potential to affect cultural resources (i.e. non-ground disturbing weed eradication, permit renewals, and noncommercial thinning). Acreage inventoried for cultural resources averaged 2,000 acres per fiscal year and ranged from a high of 2,820 acres for a single Forest restoration project to less than one acre for a recreation residence improvement or a toilet installation in a campground.

Well over 95 percent of the Section 106 inventories resulted in a determination of no historic properties affected/no effect because sites, if present, could be avoided. Determinations of adverse effect were most often related to recreational residence projects where improvements were inconsistent with the requirements stipulated in the 2006 PMOA regarding the management of recreational residences and organizational camps in Washington State. Disposal of the Leavenworth Ranger Station residence and installation of a new bridge over the Wenatchee River resulted in determinations of adverse effect. In each case a memorandum of agreement was signed outlining appropriate mitigation developed in consultation with the State Historic Preservation Officer, Yakama Nation, Confederated Colville Tribes, and the Advisory Council on Historic Preservation.

Cultural resource inventories over the past five year resulted in the documentation of 563 new sites and isolated artifacts which brought the Forest's total number of documented cultural resources to over 2,100. The majority of the sites documented were individual recreation residences on the Naches Ranger District. Begun nearly a decade ago, all recreation residences on the forest were documented by the end of 2010. To the extent possible all sites (new or previously documented) within a project area were evaluated for nomination to the National Register of Historic Places. Just over half of the sites evaluated between 2006 and 2010 were determined eligible for the National Register with a nearly equal number of sites determined ineligible. Again, the majority of the sites documented and evaluated were recreational residences.

Each Section 106 consultation included a management recommendation stipulating avoidance of historic properties and unevaluated cultural resources. Monitoring was stipulated for all large projects such as timber sales and landscapes burns, for projects involving ground disturbance in high site probability areas, areas where ground visibility precluded pedestrian survey, or in cases where an undertaking occurred within or in close proximity to documented cultural resources. No site intrusions occurred per monitoring reports prepared between 2006 and 2010. Two historic sites were damaged however and the case is currently under investigation. The National Register listed historic Steliko Warehouse was lost to fire in 2010.

Over the five-year period all of the Forest's National Register listed properties were inspected. In addition, the Forest identified 20 cultural resources as priority assets and met or exceeded its annual target involving inspection/condition assessments of these sites. The Forest has continued to add sites to its list of priority assets each year but does struggle to address deferred maintenance needs at some sites (i.e. cabin and lookout roof replacements).

Cultural resource site protection was promoted through Heritage awareness projects (e.g., artifact identification and cataloging; Copper City road restoration; American Ski Bowl Clean-up and stove replacement; Mather Memorial Parkway signage; completion of Blewett Pass interpretive signage kiosk; and an overview of Rimrock Village) and by annual refresher training for cultural resource technicians. In addition, archaeologists on the Forest hosted a number of public talks about sites of interest. A number of ranger district employees included heritage awareness in their own district-specific presentations and contributed articles to the Forest's Cascade Lookout newspaper. Three sites remain under site stewardship (Leavenworth Ski Hill, American Ski Bowl, and Red Top Lookout). Forest Archaeologists responded to several public and/or museum requests for cultural resource site information and for historic photo CDs. A number of projects were offered to the public during State Archaeology Month. Volunteers worked on the American River Guard Station and the American Ski Bowl. The use of volunteers built support for cultural resource protection and site preservation and was critical for getting work done but more effort needs to be made to offer opportunities to Forest-users.

Monitoring Item –

## **Cultural and Historical Site Rehabilitation**

The goal is to rehabilitate damaged sites eligible for inclusion on the National Register of Historic Places. The monitoring question is:

**For sites eligible for inclusion in the National Register of Historic Places, is appropriate stabilization or rehabilitation of damage being completed?**

The Wenatchee National Forest has several memoranda of agreement and memoranda of understanding that provide strict guidelines for managing and rehabilitating National Register listed and National Register eligible sites on the Forest. In 2006 a programmatic agreement for the management of recreational residences and organizational camps in Washington State was signed by the Regional Forester. The agreement streamlines the Section 106 process for projects involving structural improvements to historic recreational residences. It tiers to the Secretary of the Interior's Standards for Site Restoration, Rehabilitation, and Preservation.

Inspection of National Register listed or eligible sites was emphasized annually to determine the rehabilitation and restoration needs of individual sites. In 2007, two rock shelter sites that had been vandalized in the past were stabilized and restored at a cost of \$3000 each. The Forest worked with the Yakama Nation in planning the treatment proposed at one shelter. Neither site has been looted post-treatment. The Forest is equally proud of a project involving restoration of Civilian Conservation Corps furniture. The project, proposed by a local Boy Scout, involved in-kind restoration of a desk, chairs and benches stored at the Chelan Ranger District. The furniture had been damaged by water and was in poor condition. The Heritage Program Manager contacted the National Park Service at Harper's Ferry for guidance regarding restoration. The scout earned his Eagle badge and the furniture is now on display in a National Register listed guard station on Lake Chelan. On the Naches Ranger District the Jumpoff Lookout was restored.

Even with these projects, site restoration and rehabilitation needs exceed what the Forest can afford annually. Deferred maintenance at the Morse Creek Cabin for example has been estimated at \$20,000 for in-kind roof replacement and more than \$40,000 in deferred maintenance has been identified for the Copper City Road and Mine site complex for rehabilitation of site features among other items.

Monitoring Item -

## **American Indians and Their Culture**

The monitoring questions are:

**For those trust resources identified in treaties with American Indians, what are their conditions and trends?**

**Are sites of religious and cultural heritage adequately protected?**

**Do American Indians have access to, and use of Forest species, resources, and places important for cultural subsistence, or economic reasons, particularly those identified in treaties?**

The Forest values its relationship with the Yakama Nation and the Confederated Colville Tribes and recognition of Treaty Rights and Trust responsibilities are paramount in our day-to-day operation. A meeting to discuss government-to-government consultation protocol in 2002 indicated that our current process continues to work well with the Yakama Nation but there was clearly a need to establish a better protocol/process with the Colville Tribal Historic Preservation Officer (THPO).

In 2005 the Tribal Historic Preservation Officer (THPO) for the Confederated Colville Tribes requested revision of the Section 106 consultation process and a meeting date was established for October 2006. The meeting was held in Spokane and it involved representatives from the Colville Tribes History and Archaeology Department, the Spokane District Archaeologist for the BLM, the BLM/FS Regional Archaeologist and Forest Archaeologists from the Okanogan-Wenatchee and Colville National Forests. An agreement was drafted after the meeting but work load and disagreement over the appropriate vehicle (PMOA vs. MOA vs. MOU) has delayed implementation of a new process.

The Forest consults annually with the Yakama Nation and the Confederated Colville Tribes regarding national directives and regional policies. For the period 2006-2010, major national directives included the Special Forest Products Rule, the Farm Bill, the Tribal Forest Protection Act, and the Sacred Sites Act. In accordance with the Special Forest Products Rule, fees for some special forest products are waived for tribal members and privacy is provided for ceremonial activities. The Forest recognizes the need for a written policy/direction to insure consistency across the Forest when tribal requests for Forest products are made.

Monitoring Item –

## **Coordination and Communications of Forest Programs with Indian Tribes**

The goal is to coordinate with appropriate Tribal representatives for all projects in which Indians may have a concern. The monitoring questions are:

**Are American Indian rights being protected on National Forest lands?**

**Are projects with activities or areas of concern to Indians being coordinated with appropriate Tribal representatives?**

Recognition of, and the honoring of, existing treaties and executive orders is crucial in government-to-government relations between the Forest, the Yakama Nation, the Confederated Colville Tribes, and other tribes as appropriate. Protection of American Indian treaty and religious freedom-rights are incorporated into Forest decision-making. Consultation with tribes that may have an interest in management activities is initiated at the earliest stage of project planning and is carried through to completion of the project. The Forest shares project information through distribution of the Forest's Schedule of Proposed Actions (SOPA), Passport in Time newsletters, and via government-to-government letters for all projects involving a decision notice or decision memo.

The number of government-to government consultations has increased each year and normally coincides with the number of Section 106 reports prepared annually. Generally, the tribes were notified via government-to-government letter which described the project in detail, the type of NEPA document prepared, and provided very specific information how the Forest would consider effects to cultural resources. Each letter sought information regarding resources of interest to the tribes including traditional cultural properties (TCPs) and further stated that Tribal Historic Preservation Officers (THPOs) or appointed staff would be contacted immediately if a pre-field literature review identified a TCP or a potential TCP. Each letter stated that special arrangements would be made if and when sensitive information was provided. Every letter included an offer to meet in person to discuss the project further. For major projects like Forest Plan Revision and Access Travel Management planning, the Forest Supervisor or appointed line officer met with each tribal council and consultation is on-going. The Forest Supervisor and designated Line Officers met annually with the Yakama Nation and the Confederated Colville Tribes to discuss projects in general.

In accordance with the Organic Act and the Archaeological Resources Protection Act (ARPA), the Yakama Nation and the Confederated Colville Tribes were notified by the Forest Archaeologist when permits were issued to non-government contractors for cultural resource inventories. An ARPA permit was issued for the Highway 2 Bridge Replacement Project and for work associated with the I-90 East project.

## WILDLIFE

### Management Indicator Species Habitat

Monitoring Item -

#### Primary Cavity Excavators

The goal is to maintain viable populations of primary cavity excavators.

**Is primary cavity excavator habitat being managed in the proper amounts within land allocations?**

Primary cavity excavators (PCEs) are considered to be focal species within forested ecosystems because of the important ecosystem processes and functions they carry out. For example, one function includes the creation of cavities that provide habitat for a wide variety of other birds and mammals.

#### Monitoring of Primary Cavity Excavator Habitats

A primary cavity excavator monitoring study was initiated in 2001 and was designed to determine the direct, short-term effects of timber harvest and harvest systems on snag numbers. In addition, a secondary objective was to monitor the effectiveness of meeting forest plan snag standards. To date, the fates of 1,113 snags within five dry forest restoration projects have been monitored. Additional monitoring is underway to determine how different harvest systems and prescribed fires influence snag numbers, and to develop statistically accurate measures of snag attrition rates.

**Snag sizes and attrition rate in FY 2005**

Snag Size (Inches DBH)	Mean Attrition Rate
6-10	48.1%
10-20	34.2%
>20	30.0%

#### Recommendations

Summarize the monitoring information from 2006 and 2007 to show effects of post-fire timber harvest (10 years post-treatment) on snag attrition and primary cavity excavators.

Survey snags before and after timber harvest to determine if snag standards are being met.

Develop a snag protocol from statistically accurate measurements of snag attrition rates.

Monitoring Item-

#### American Marten

The goal is to maintain viable populations of American marten. The monitoring question is:

**Is the late-successional habitat network providing for the viability of American marten?**

The American marten was selected as an indicator species in the Wenatchee Forest Plan due to their association with late-successional forest habitats. When the LRMP was amended by the Northwest Forest Plan in 1994, a conservation strategy was adopted for late-successional forest species that included a network of habitat reserves. While protocols for monitoring American marten have been established, limited efforts have been made to determine the feasibility of using the protocol to monitor marten populations in the habitat reserves on east-side forests. In 2003, a project was implemented to determine if track plates could be used to monitor marten within a subset of the habitat reserves located on the forest. A paper has been published that summarizes the results of the monitoring study (Munzing and Gaines 2008) and copies are available at the Forest Headquarters. The non-invasive hair snare technique as described in Long et al. (2009) has been implemented as part of a rare carnivore survey looking at a landscape level genetic distribution and highway crossing of rare carnivores. This survey includes American marten, black bear, grizzly bear, gray wolf, wolverine, lynx and fisher. The results are expected to be published in 2012 or 2013.

## Recommendations

Disseminate literature to districts to incorporate into project work.

Use the results of the monitoring study to develop a forest monitoring protocol in association with the revised Forest Plan.

Monitoring Item-

## Landbirds

The goal is to maintain viable populations of landbirds. The monitoring question is:

### **How do landbird populations respond to changes in their habitats that result from the implementation of the Dry Site Strategy?**

The conservation of landbirds remains an important issue on the Wenatchee National Forest. With the finalization of the Okanogan-Wenatchee National Forest Restoration Strategy (2010), several recent local studies were summarized and incorporated. Out of the following monitoring studies the *Pendleton Study*, the *Fire and Fire Surrogate (FFS) Study*, and *Birds and Burns Study* come Gaines et al. 2007, Saab et al. 2007, Lyons et al. 2008, Gaines et al. 2009, and Gaines et al. 2010. Below is a summarization of this literature as it pertains to landbirds (Restoration Strategy 2010).

Restoring habitat for avian focal species can be accomplished with treatments that include thinning from below followed by prescribed fire.

The further need to research more focused spring prescribed burning effects has been exposed.

A key component of restoring and maintaining viability of avian focal species is large trees and snags for foraging and nesting.

## Recommendations

Research spring burning effects as a tool of restoration for avian focal species (i.e. ground nesting species) with greater sample sizes.

Hold workshops to present the results of these studies and management recommendations to managers and interested publics in 2012.

## THREATENED AND ENDANGERED SPECIES

Monitoring Item-

### Northern Spotted Owl

The goal is to recover to a viable spotted owl population. The monitoring questions are:

**What is the level of spotted owl productivity?**

**Is spotted owl habitat being maintained or restored?**

Monitoring of spotted owls on the Forest has been conducted as part of Northwest Forest Plan monitoring program which includes the Cle Elum study area (Forsman et al. 2002), and project level surveys. A study with additional partners was initiated in 2003 to explore the effects of dry site treatments on spotted owl and barred owl distribution and resource selection in a study area located on the Wenatchee River Ranger District. Out of the recent efforts came: Lint (2005), Anthony et al. (2006), Davis and Lint (2005), Ager et al. (2007), Lehmkuhl et al. (2007), Kennedy et al. (2008), and abstract below is from Singleton et al. (2010) on barred owls. Literature is available through the Forest Headquarters Office or the Wenatchee Forestry Sciences lab. The final recovery plan for the northern spotted owl (USFWS 2008) outlines habitat management strategies for fire prone forests. There has been a shift from the reserve type strategy due to habitat losses from high intensity wildfires to conservation strategy that is more plastic than a reserve strategy.

#### ABSTRACT

Competition with barred owls (*Strix varia varia*) is an important factor contributing to the continued decline of threatened northern spotted owl (*Strix occidentalis caurina*) populations in the Pacific Northwest, USA, but basic information on habitat selection and space use patterns of barred owls is lacking for much of the region. We investigated space use and habitat selection by tracking radio-tagged barred owls in the Eastern Cascade Range of Washington, USA, from 2004 to 2006. We surveyed for barred owls across the 309-km<sup>2</sup> study area and confirmed presence of barred owl pairs at 21 sites. We collected movement data on 14 barred owls from 12 sites. Mean annual 95%fixed-kernel home-range size was 194 ha for females ( $n = 4$ ,  $SD = 70$ ) and 288 ha for males ( $n = 5$ ,  $SD = 114$ ). Home ranges were located more frequently than expected in areas with low topographic position, gentle slopes, large overstory tree-crown diameter, high normalized difference vegetation index (NDVI), overstory tree canopy closure > 72%, and a moderate amount of solar insolation. Within home ranges, areas that had large tree crown diameters, low topographic positions, and gentle slopes were used more frequently than expected. The resource selection function we developed for barred owls in our study area indicated that barred owls used areas with the combination of low values for topographic position and slope and higher values for NDVI, solar insolation, and an interaction term for canopy closure and tree-crown diameter. In comparison to published information on northern spotted owls, barred owls used areas with similar canopy closure and

tree size classes, but barred owl home ranges were much smaller and more concentrated on gentler slopes in valley bottoms. This information may contribute to the development of management practices that maintain forest characteristics appropriate for spotted owl habitat and prey in areas where spotted owls are least likely to be excluded by territorial barred owls in the Eastern Cascades of Washington. (*Journal of Wildlife Management* (2010) 74(2):285-294).

Summary of the literature above as it pertains to northern spotted owl is as follows:

The spotted owl population is declining at a rapid rate.

One important factor in loss of spotted owl habitat is wildland fire.

Barred owls are successfully occupying moist forest types that were previously occupied by spotted owls. There appears to be some habitat partitioning and dry forest habitats may be important for spotted owl recovery.

Models have been shown to successfully inform managers about tradeoffs between spotted owl habitat, treating the landscape to protect dry forest through altering fire behavior and restoring forest structure.

The new recovery plan (2008) describes east-side, fire prone forests and landscapes transitioning to an active habitat management conservation strategy.

## **Recommendations**

Monitoring should include tracking the changes in the availability of suitable spotted owl habitat over time. Baseline habitat conditions were established in the Wenatchee National Forest Late-successional Reserve Assessment in 1997 (USFS 1997). This information was updated in 2002 and should be revisited in 2012 to track habitat trends.

Continue to monitor >50% of the known spotted owl sites on the Forest in order to track trends in the number of young/site over time.

Validate monitoring suitable spotted owl habitat and spotted owl productivity (young/site) to determine trends in the spotted owl population on the Forest.

Cooperate with the Wenatchee Forestry Sciences lab to monitor how dry site restoration projects are influencing resource selection by spotted and barred owls.

Incorporate the USFWS recovery plan (2008) into the Forest Plan Revision.

# SURVEY AND MANAGE SPECIES

Monitoring Item-

## **Tiny Canyon Mountainsnail (Formerly Chelan Mountainsnail)**

The goal is to provide for viable populations of the Tiny Canyon mountainsnail. The monitoring questions are:

**What are the habitat relationships of the Chelan Mountainsnail?**

**How do dry forest restoration treatments affect the Chelan Mountainsnail?**

The Chelan Mountain snail (Tiny Canyon Mountainsnail) is a Survey and Manage species and is also on the R6 Sensitive Species list. This species is endemic to the Wenatchee National Forest and has only been located on the Chelan and Entiat Ranger Districts. Little is known about this species as not formal analyses were available concerning what habitats they used and it was uncertain how dry forest restoration treatments might affect them. Because of this, two monitoring studies were implemented in 2005. One used existing information about known Chelan Mountain snail sites to evaluate their habitat relationships. The other study was completed in 2008 looking into the effects of prescribed burning on the abundance of Chelan Mountainsnails now called the Tiny Canyon mountainsnail (in press). Below is the Abstract to the later study.

### ABSTRACT

The restoration of natural fire regimes has emerged as a primary management objective within fireprone forests in the interior western US. However, this objective becomes contentious when perceived to be in conflict with the conservation of rare or endemic species. We monitored the effects of two forest restoration treatments, spring- vs fall-prescribed burning, on the density of the endemic Tiny Canyon mountainsnail (*Oreohelix* sp.). We used a randomized block design with three replicates of each of the treatments and controls, and analyzed our data using multivariate repeated measures analysis of variance. We conducted pre-treatment surveys for mountainsnails and post-treatment surveys at three time periods: within two weeks of the treatment, the next snail season following the treatment (next spring or fall), and one year following the treatments. We did not detect any statistically significant differences in mountainsnail densities as a result of the spring-burn or fall-burn treatments, time of survey, or treatment×time interaction. The burns resulted in a fine-scale mosaic that included un-burned and lightly burned areas that acted as refuge for mountainsnails. We recommend that the application of prescribed burning as a restoration treatment within mountainsnail habitat be conducted under prescriptions that create a mosaic of burn conditions, including small unburned areas, and that prescribed fire return intervals mimic natural fire intervals (10–40 years).

### **Recommendations**

Disseminate recent literature to managers at ranger districts for incorporation into surveys.

Continue to survey for Tiny Canyon mountainsnails using the results from the habitat associations study and fire effects study to guide survey priorities.

# SOIL, WATER, FISHERIES AND RELATED WATERSHED MANAGEMENT

Monitoring Item –

## Status of Aquatic Management Indicator Species

### Are viable populations of Management Indicator Species (MIS) being maintained?

Aquatic Management Indicator Species on the Wenatchee National Forest include spring and summer Chinook salmon, sockeye salmon, steelhead, bull trout and west slope cutthroat trout. Spring Chinook salmon within the Upper Columbia (Wenatchee, and Entiat subbasins) on the Forest are considered to be part of the Upper Columbia Evolutionary Significant Unit (ESU) and are listed as Endangered under the Endangered Species Act (ESA). Spring Chinook salmon within the Upper Yakima and Naches subbasins (Naches and Cle Elum Ranger Districts) are in the Mid Columbia ESU and are not listed for protection under the Endangered Species Act. Summer Chinook salmon are not found within the boundaries of the Naches and Cle Elum Ranger Districts. Summer Chinook within the Entiat and Wenatchee subbasins (Entiat and Wenatchee River Ranger Districts) are considered to part of a larger population that includes fish spawning in the Columbia River and tributaries, excluding the Yakima River, and are not protected under the Endangered Species Act.

As with spring Chinook, steelhead that occur on the Forest are included within two different ESUs; the Upper Columbia (Entiat, Wenatchee River Ranger Districts, and Methow Valley District and Tonasket District) and Mid Columbia (Naches and Cle Elum Ranger Districts). Upper Columbia steelhead are listed as Endangered, while Mid-Columbia steelhead are listed as a Threatened species. There are no anadromous fish native to the Chelan Ranger District although Chinook salmon have been introduced into Lake Chelan as a sport fish.

The Wenatchee River and Lake Wenatchee supports one of only two viable sockeye populations in the Columbia River. The other sockeye population utilizes the Okanogan River and Lake Osoyoos.

Bull trout are found within all subbasins on the Forest with the exception of Lake Chelan (Chelan Ranger District) although historically they were present in the lake.

Westslope cutthroat trout are native cutthroat trout in the mid and upper Columbia. They are a Forest Service sensitive species.

Anadromous fish populations are monitored by the Chelan County PUD, Douglas County PUD, U.S. Fish and Wildlife Service (USFWS) and Washington Department of Fish and Wildlife (WDFW) in the Upper Columbia. Chinook salmon surveys in the Entiat River are available from the U.S. Fish and Wildlife Service, Mid-Columbia Fishery Resource Office in Leavenworth, WA. Anadromous fish returns are monitored by the Yakama Nation in the Yakima River. Results are available at the Yakima-Klickitat project website, [www.ykfp.org](http://www.ykfp.org).

The Forest cooperates with the WDFW and the U.S. Fish and Wildlife Service to conduct bull trout spawning surveys across the Forest and assists with steelhead surveys in the Entiat, and Naches subbasins. Results of the bull trout surveys are reported here.

## Bull Trout

Bull trout redd counts in the subbasins of the Wenatchee National Forest are shown in the 2 tables below.

### Bull trout redd counts from streams in the Upper Columbia Basin (data from USFWS and USFS).

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Icicle watershed								8	3	2
Peshastin watershed	1	5	9							
Chiwaukum River	29	35	42	23	31	32	35	33	34	18
Nason watershed	3	7	3	15	3	17	0	2	3	
Chiwawa watershed	254	437	421	376	250	555	495	436	425	358
Chiwawa Index 11.0 mi	208	340	304	292	174	332	323	264	271	191
White/Little Wenatchee	22	123	64	54	59	125	71	104	102	40
Redd Total:	309	607	539	468	343	729	600	583	562	418
Miles Surveyed Total:	29.0	31.6	31.0	26.1	23.9	26.0	24.5	41.0	35.8	
Mad River	34	26	52	37	37	7	29	9	7	6
Entiat River	3	7	5	47	50	21	12	21	17	7
Redd Total:	37	33	57	84	87	28	41	30	24	13
Miles Surveyed Total:	7.8	7.8	7.8	12.7	12.0	12.7	12.7	13.0	13.0	13.0

Note: Not all bull trout redd counts were complete, and length of stream surveyed has varied between some surveys, in many cases with new survey reaches being added in recent years. In 2010 the total doesn't include counts from Nason Creek or the Little Wenatchee. Please refer to the annual spawning survey reports for more complete information.

**Summary of bull trout spawning surveys (redd counts) in index areas  
of the Yakima and Naches Sub-basins, 1999-2010**

(R=Resident, F=Fluvial, F/R=Fluvial/Resident, AD=adfluvial). WDFW Files, Yakima, WA.

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Yakima River (F)</b>												
Keechelus to Easton Reach *		2	1		1			3	1			
<b>Ahtanum Creek (R)</b>												
N.F. Ahtanum Cr. (Shellneck Cr.)	7	11	20	17	12	8	6	7	8	1	3	0
MF Ahtanum Cr *	0	10	1	6	8	11	5	6	5	3	9	15
S.F. Ahtanum Cr. *		5	14	13	7	5	3	4	5	3	6	2
<b>Naches River (F)</b>												
Rattlesnake Cr. * (L.Wildcat Cr., Shell Cr.)	44	45	57	69	54	32	15	40	13	37	36	64
American R. (Union Cr., Kettle Cr.)	30	44	36	27	30	40	35	55	31	22	29	47
Crow Cr.	19	26	6	9	9	6	4	8	8	2	5	9
<b>Rimrock Lake (AD)</b>												
S.F. Tieton R. * (Bear Cr.)	161	144	158	141	178	178	205	189	152	266	259	194
Indian Cr. * (+spring tribs)	205	226	117	100	101	50	91	106	58	130	200	144
N.F. Tieton (upper)* (+unnamed trib)						1		1	37	28	15	18
<b>Bumping Lake (AD)</b>												
Deep Cr. *	107	147	51	120	57	97	73	95	130	145	178	199
Bumping River (upper)		0				0			0	0	2	0
<b>N.F. Teanaway River (F/R)</b>												
NF Teanaway/DeRoux Cr. *							2	1	0	0	1	0
<b>Kachess Lake (AD)</b>												
Box Canyon Cr.	17	10	14	15	8	19	8	8	2	8	21	30
Kachess R (upper) *		15	14	0	16	8	3	0	22	2	2	13
<b>Keechelus Lake (AD)</b>												
Gold Cr.	40	19	15	31	9	20	7	8	6	40	29	23
<b>Cle Elum &amp; Waptus Lks (AD)</b>												
Cle Elum R.(up) & Waptus R*		0	0	0	0			0	0	0	0	
Summary	593	630	704	504	548	490	475	457	531	478	687	795

\* Incomplete survey; index area not fully defined or adequately monitored: Yakima R. 2000, 2001, 2003, 2006. M.F. Ahtanum 2001, 2008. S.F. Ahtanum 2000, Rattlesnake 2007, 2008. S.F. Tieton 1990-1993, 1995, Indian 1984-1987, N.F. Teanaway 2005, 2006, 2008. Kachess 1998, 2005, 2006

Cle Elum 2000-2002, 2006, 2007, N.F. Tieton 2004, 2006, Bumping 2000, 2004, 2008. Box 2007, Gold 2007, Crow 2008.  
(Redds in small tribs (parenthesis) included in total stream count.)

\* S.F. Tieton redd counts outside of the standard index area not included in above totals: 2000-2002 not checked, 2003=14, 2004=2, 2005=6, 2006=22, 2007 & 2008 not checked, 2009=30

\* Exploratory redd count surveys conducted in 2009: N.F. Little Naches - 0, Quartz & N.F. Quartz - 0, Nile - 0, upper Crow (above barrier falls) - 0

The 2010 bull trout redd counts in the northern half of the Forest are all below the 1999-2009 average, while those in the south half are above average. In fact, the 2010 total in the south is the second highest count on record. There is no explanation for the low counts in the north. The Entiat subbasin had the lowest count on record. In the Mad River the 2010 count is only 21% of the 1999-2009 average.

## **Recommendations**

Continue to monitor these populations.

Monitoring Item-

## **Riparian Watershed Standard Implementation Monitoring**

**Are Standards, Guidelines and Related Best Management Practices (BMPs) for fish habitat and riparian areas defined in the Forest Plan being applied in the design and execution to timber sales, watershed restoration, and other projects where fish/riparian standards are a concern?**

In Fiscal Year 2010, approximately 19 miles of stream were enhanced or restored through projects with outside partners or with Forest involvement alone. This amount includes miles of habitat opened up above replaced culverts, miles of stream bank that were replanted, miles of stream into which salmon carcasses were added for nutrient enhancement, or miles of stream that were reconnected to a moist meadow/wetland.

## **Recommendations**

Continue a variety of projects as funding and opportunities arise.

Monitoring Item-

## **Watersheds and Aquatic Habitats**

**Are stream and habitat improvement projects meeting aquatic habitat objectives as stated in the Forest Plan, Policy Implementation Guide (PIG), and Salmon Summit?**

Sediment

The Wenatchee National Forest Land and Resource Management Plan states that spawning gravel will consist of no more than 20 percent fine sediment  $\leq 1.00$  mm. Fine sediment is a natural component of streambeds, however, elevated levels of fines resulting from accelerated erosion can adversely affect salmonid spawning and rearing success. Fine sediment levels were monitored on 5 stream reaches in the Entiat Subbasin, 7 reaches in the Wenatchee Subbasin, and 10 reaches in the Naches Subbasin. The last sediment sampling in the Upper Yakima Subbasin occurred in 2009 (6 reaches). In 2010 and 2009 for the Upper Yakima, the fine sediment levels in all but 2 reaches are within the Forest Plan standard. In the case of one of the exceedances, the reach is in an unmanaged subwatershed and the fine sediment level while just barely exceeding the standard is well below the long-term average for the reach.

## Temperature

The Forest has an on-going program to monitor water temperatures. In accordance with the Clean Water Act (CWA) of 1977, which set federal standards for water quality, the State of Washington developed state standards to meet or exceed the CWA 303(d) list of federal standards. There are five water quality parameters that have standards set by the State, including water temperature. Water temperature is a key component of fish habitat and aquatic ecology. Cold water fish species such as trout and salmon are particularly sensitive to very high and very low temperatures. Water temperature criteria set by the State (Class AA Streams <60.8°F, Class A Streams <64.4°F) and water temperature criteria set by the *Wenatchee Forest Plan* (<61°F and 7 day average max temperature <58°F), focus mainly on summer maximum water temperatures. However, harsh winter rearing conditions could be more limiting than summer increases in stream temperatures within some streams, such as, but not limited to, the Entiat and Mad Rivers. Annual water temperature data are used for multiple purposes including;

- Development of a regional data base that may be used to revise Washington State temperature standards for eastside streams

- Future iterations of Watershed Analyses

- Use in future Forest Plans to describe desired future conditions

- Support for the water quality element in the Washington State Watershed Planning project

- Used in analysis for proposed actions on National Forest System lands

- Biological assessments for three ESA listed species (bull trout, spring Chinook salmon and steelhead trout).

The number of stream temperature sites monitored from 1998 to 2010 by subbasin and watershed is shown in the table below.

Subbasin	Watershed	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Entiat	Entiat River	2	13	16	16	15	15	14	13	14	15	14	12	11
	Mad River	10	10	11	10	11	13	10	12	7	8	8	10	10
Entiat Total		12	23	27	26	26	28	24	25	21	23	22	22	21
Naches	Little Naches River	8	7	8	7	6	7	8	7	3	3			2
	Rattlesnake Creek	3	3	3	3	3	3	3	3	3	3			
	Tieton River	2	4	5	5	5	5	5	5	3	5			
Naches Total		13	14	16	15	14	15	16	15	9	11			2
Upper Yakima	Cle Elum River					3	3	3	2		3	1	3	2
	Kachess River					2	1	2	2	2	2	1	2	2
	MF Teanaway River					3	4	4	2	4	4	4	4	2
	Taneum Creek					5	5	5	4		4	4	5	5
Upper Yakima Total						13	13	14	10	6	13	10	14	11
Wenatchee	Chiwawa River	1	1	2	2	2	2	2	2	2	2	2	2	2
	Mission Creek	2	1	2	2	2	2	2	2	2	2	2	2	2
	Nason Creek	1	1	1	1	1	1	1	1	1	1	1	1	1
	Peshastin Creek	1	1	1	1	1	1	1	1		1	1		1
	Wenatchee River	3	3	4	3	4	4	4	4	3	3	4	3	2
	White River Lit Wenatchee	2	2	2	2	2	1	2	2	2	1	1	1	2
Wenatchee Total		10	9	12	11	12	11	12	12	10	10	11	9	10
Grand Total		35	46	55	52	65	67	66	62	46	57	43	45	44

The variation in the highest annual 7-day average maximum water temperature (7DAWMT) from 2000 to 2010 is shown in the table below. The 71 sites in the table have at least 6 years of stream temperature data. The 1998-2010 mean of the highest of each year's 7DAMWT is shown in the 2<sup>nd</sup> column of the table. The next 13 columns show that year's deviation of the 7DAMWT from the grand mean. The color codes are a visible indicator of the size and direction of each year's deviation from the grand mean. For example for the American River the 1998-2010 average of each year's highest 7DAMWT is 14.1° C and in 1998 the highest 7DAMWT was 1° cooler than the site's grand mean. Green represents the negative deviations (cool), uncolored are values around 0 (or no data) and pink represents positive departures (warmer) from average. The last 10 lines of the table show various summaries/predictions.

The table shows the contrast between 2009 and 2010 in the 7DAMWT at each site. In 2009, 39 out of 45 sites were warmer than average by at least .2 °C. Just the opposite situation occurred in 2010 with 43 out of 45 sites at least .2 °C cooler than average. On the ground there were no biophysical changes along the stream network at or upstream from the sites. So what caused the large variations?

Site	Mean 7DAMWJT	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Tot # Yrs
American @ USGS Gage	14.1	-1.0	-3.3	-0.5			0.9	1.8	2.2	-0.4	0.5				8
Bear Ck Rd 1900	16.2	1.1		0.3	-0.5	-1.0	0.0	0.6	-0.5						7
Beaver Ck NF	12.8	-0.1	0.0	0.3	2.1	-0.6	-0.2	0.7	-0.3	-1.0	-0.5	-0.4	0.2		12
Beaver Ck SF	14.4			0.2	0.5	-0.3	1.6	1.3	0.0	-1.4	-0.3	-0.4		-1.0	10
Box Canyon Ck	14.8					-1.3		1.2	0.3	0.6	-0.8	-1.1	1.4	-0.3	8
Bumping at Am Fks CG	20.2	1.8	-2.0	-0.3	1.1	-1.4	0.8	0.9		-0.4	-0.3				9
Bumping River Halfway Flat	19.3	1.6	-3.4	-0.3	1.4	-2.1	0.6	0.8	1.1						8
Chiwaukum Ck	15.0	1.2		-0.6	0.4	-1.5	0.1	1.3	0.6	-1.0	-1.4	-0.1	0.6		11
Chiwawa abv diversion	17.0		-3.7	-1.3	1.3	-1.4	0.8	2.1	2.6	-0.8		-0.3	1.3	-1.0	11
Chiwawa near mouth	17.4	0.4		0.7	-0.2	-1.9	0.4	1.8	2.2	-1.2	-1.2	-0.8	0.9	-1.5	12
Cle Elum R dcptn pass trlhd	18.6					-2.2	1.0	2.2	1.5		-1.5	-0.9	0.5	-0.4	8
Cle Elum us Thorp Ck	18.9					-1.2	0.6	0.9			-0.3		1.0	-1.0	6
Cooper RD nr mth	20.1					-2.4	0.5	1.5	1.6		-1.1		0.1		6
Cougar Ck	13.8	0.7	-1.5	0.1	0.5	-0.6	0.2		0.3						7
Crow Ck Rd 1902 mouth	16.1	1.5	-2.3	0.2	0.2	-0.9		1.0	0.2						7
Entiat RM 26	16.7		-2.8	-1.6	1.2	-1.1	0.5	1.8	2.0	-0.7	-0.9	0.7	1.0		11
Entiat R abv NF RM 34 KM 58	13.2		-2.3	-1.2	1.3	-0.7	0.8	2.2			-0.3				7
Entiat R Cottonwood CG	12.8			-1.1	0.3	-1.3	0.2	1.3	1.1	0.1	-0.8	0.1	0.9	-0.7	11
Entiat R Dill Ck RM 21.1 KM35	18.1		-3.2	-1.7	1.9	-0.9	0.5	2.1	2.7	-0.6	-2.0	0.7	1.1	-1.0	12
Entiat R RM10.8 KM 18	20.0		-3.9	-1.6	2.8	-0.8	1.1		3.8	0.1	-0.7	1.2		-1.9	10
Entiat R RM31 KM 52	15.1			-1.8	0.9	-1.2	0.2	1.9	1.9	-0.3	-1.1	0.2	0.7	-1.4	11
Entiat R RM8.5 KM 14	21.3			-2.2	1.8	-1.5	0.2	2.8	2.2	-1.2	-1.4	0.4	0.9	-2.0	11
Entiat RM1.4 KM 2	22.0		-3.9	-1.7	1.8	-1.1	0.6	2.5	2.5	-1.2	-1.4	0.5	1.4		11
Entiat RM 10.2	20.6		-3.8	-2.2	2.2	-1.3	0.7	2.5	3.1	-0.4	-1.2	0.7	1.8	-1.8	12
Entiat RM 12.5	19.7	0.6	-3.7	-1.6	-0.4	-0.9		2.6	3.1	-0.4	-1.5	0.9	1.3		11
Entiat RM 15	18.7		-3.4	-1.0	1.7	-0.8	0.7		3.1	-1.3	-0.6	0.8	1.7	-1.0	11
Entiat RM18 below Stormy	18.9		-2.2	-1.5	1.2		0.7	1.3	2.1	-0.7	-0.9	0.4	1.3	-1.2	11
Entiat RM 24 near Bren	17.1		-3.3	-1.4	1.9	-0.8	0.7	2.6		-0.3	-0.6	0.9	1.3	-1.0	11
Entiat RM 5.3	20.8		-3.7	-1.4	1.9	-1.0	1.7	2.1	2.3	-0.9	-0.9	0.8		-1.4	11
EntiatRM 3.2	21.4		-4.3	-1.2	2.5	-0.6	0.9	2.2	2.8	-2.5	-0.9	0.9	1.7	-1.2	12
Hause Ck Rd 1500-313 KM 1	16.8			0.3	1.0	-1.3		1.5	0.3	-1.1	-0.8				7
Indian Ck Hwy12	12.3		-1.1	-0.1	0.2	-0.6	0.3	0.8	0.6	-0.2	-0.3				9
Little Naches Hwy 410	18.2	0.3	-3.4	-4.1	1.9		1.0	2.4	2.3	-0.4	0.2			0.0	10

Site	Mean 7DAMWT	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Tot # Yrs
Little Naches MF Rd 1913	14.9	0.7	-1.9	-0.5	0.2	-1.5	2.5	0.6	-0.2						8
Little Naches NF Rd 1913 mouth	15.6	1.9	-1.2	0.2	-1.2	-0.5	-0.5	1.9	1.1					-1.3	9
Little Rattlesnake 1500 Rd KM 1	17.2	1.0	-0.8	1.3	0.4	-0.1	0.5	0.7	0.0	-2.4	-0.6				10
Little Rattlesnake FS Bndry KM 8	15.6	0.4	-2.2	0.8	1.6	-0.7	0.4	1.3	1.1	-1.9	-0.7				10
Little Rattlesnake Rd 1518 KM 13	13.4	0.3	-1.9	-0.1	1.0	-0.7	1.0	1.0	1.5	-1.6	-0.2				10
Little Wen near mouth	18.0	1.8	-1.7	-0.2	0.8	-1.3	1.4	1.6	1.6	-1.1	-0.8	-1.1		-1.1	12
Mad abv Cougar KM 24	13.7		-1.6		0.5	-0.6	0.4	0.8	0.0	0.5	-0.3	-0.1	1.4	-1.0	11
Mad Berg KM 29	14.1	1.9	-2.1	-0.2	0.2	-0.9	0.1	1.2	-0.5	0.4			1.2	-1.6	11
Mad Jimmy KM 32	15.4	1.9	-2.7	-0.1		-1.4	0.0	1.7	1.3	0.3	-1.0				9
Mad KM9 abv Hornet	19.3			0.1	0.4		0.3	0.7	0.4	0.2	-0.6	-0.6	0.6	-1.7	10
Mad R abv Blue Ck KM39	15.3	3.0	-1.0				-0.7		1.4			-0.6	-0.6	-1.2	7
Mad R abv Pine Flats	19.3	0.9	-2.4	0.3	0.9	0.1	0.3		0.9				0.6	-1.8	9
Mad R at Lake Outlet KM43	23.0			0.9			1.6	3.4	1.5		-0.6	-1.6	-3.3	-1.9	8
Mad R at mouth	19.5			0.0	1.2	-1.1	0.1	1.3	0.8		-0.9	-0.3	0.8	-1.8	10
Mad Tillicum KM 3	19.2	-0.7	-2.0	0.7	1.6	-0.8	0.7	1.6	1.5	-3.0	-0.2	0.3	1.3	-1.2	13
Mad Wdy 14 km	18.4	-0.6	-1.6	0.8	1.6	-2.5	1.1	0.7	0.5	0.3	-0.1	-0.5	0.9	-1.1	13
Mad Yng KM 20	15.0	-1.1	-1.5	-0.1	0.6	-0.8	0.4	1.5	0.7	0.7	-0.1	0.1	1.2	-1.0	13
Manastash SF Buck Mdws	14.5					-0.4	0.9	1.3	1.4		-2.5		0.5	-0.9	7
Mssion near Sand	18.7	0.9		0.5	2.5	-1.2	0.2	1.7	1.0	-2.1	-1.4	-0.5	0.7	-2.3	12
Mud Ck	15.7	0.5	-0.1	1.0	0.7	-0.1	-1.0	-1.2							7
Nason near mouth	20.5	2.0	-2.8	0.1	1.1	-1.3	1.5	1.3	2.1	-1.2	-1.0	-1.5	0.9	-1.2	13
Peshastin blw Ingalls KM14	15.6	-0.5	-1.4	0.1	0.9	-0.8	0.8	1.0	1.0		0.1	0.2		-0.9	11
Pine Ck Wk Center	14.6		-0.9	0.1	0.9	-0.8	0.5	0.8	0.8	-0.7	-0.5				9
Sand Creek	16.6	0.8	-1.5	0.8	0.7	-0.6	0.9	1.4	0.3	-1.5	-1.2	-0.2	1.1	-1.6	13
Swauk Ck abv Pipe Ck	13.7					-0.5	0.7	1.8			-1.1	0.1	0.5	-1.4	7
Swauk Ck Min Sprgs	19.8					0.0	0.9	1.5	0.0		-0.4	-0.9	0.4	-1.6	8
Taneum Ck CG	19.2					-0.8	0.9	1.1	0.2		0.1	-0.9	0.4	-1.2	8
Taneum SF	15.6					-0.2	0.6	1.0	0.5			-0.9	0.3	-1.4	7
Teanaway NF abv Stafford	17.6					-0.2	0.4	1.5	0.8	-0.2	-0.6	-0.9	0.6	-1.1	9
Teanaway NF ds Deroux Ck	12.2					-1.0	0.4	0.8		0.3	-0.4	-0.5	0.5	-0.3	8
Teanaway WF	20.5						2.7	-0.1		0.1	-1.4	-1.9	0.7		6

Site	Mean 7DAMW/T	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Tot # Yrs
Teanaway MF	18.9					-0.8	1.1	1.3	0.4	0.7	-0.5	-1.1	-0.9		8
Tieton SF Rd 1010 KM3	16.9	0.2	-3.2	-0.5	0.8	-1.2	0.3	0.7	2.3		0.8				9
Tieton SF Rd 1070 KM22	14.2	0.3	-2.9	-0.7	1.1	-0.8	0.2	0.7	1.8		0.2				9
Tillicum	14.4	-0.2	-0.9	-0.2	-0.2	-0.5	0.0	1.9							7
Wenatchee Tumwater	20.5	1.8	-4.1	-1.1		-1.8	0.6	2.2	1.6			-0.2	1.7	-0.9	10
White River near Mouth	14.5	1.2	-2.8	-1.5	0.7	-0.9		2.1	1.6	0.2			1.3	-1.5	10
Yakima R abv Cabin Ck	19.8					-0.9	1.9	1.5	1.6	-0.8	-1.5		-1.2	-0.6	8
Average Deviation		0.2	-2.6	-0.5	0.8	-1.2	0.7	1.4	1.4	-0.6	-0.5	0.5	1.3	-0.8	
Total Sites		45	55	52	64	66	66	62	46	56	43	45	44	71	
# Warmer .2		0	14	47	0	54	64	54	9	3	14	39	0	71	
# Cooler -.2		43	26	3	59	4	1	3	32	47	21	4	43	0	
# Neutral		2	15	2	5	8	1	5	5	6	8	2	1	0	
Water Temp Characterization		warm	cool	cool	warm	cool	warm	hot	hot	cool	cool	cool	warm	cool	
Air Temp Departures (Jul, Aug)		++++	---	-	-	+	++	++	+++	++++	+++	+-	++++	+-	
Flow Departures (Jul, Aug)		-	+++	0,0	--	+,0	--	--	--	-	-	+-	-	0,0	
Prediction using both months		warm	cool	cool	warm	warm	warm	warm	warm	hot	hot	warm	hot	warm	
Prediction using August only		warm	cool	cool	warm	cool	warm	warm	warm	warm	cool	cool	warm	cool	

There are 2 environmental factors that vary year to year and can have a large impact on maximum stream temperatures: Low flow water volume (baseflow) and air temperature. Variation in those parameters is shown in the tables below.

Daily high air temperatures for the Wenatchee airport summarized for each July and August from 1998-2010. The climatic normals are for the period 1971-2000. Colors have basically the same meaning as in the table above.

Mon/Yr	AVG MAX	AVG MAX DEP	# Days Max Temp 5-10° Higher from Average for that Day	# Days >=10° Higher from Average for that Day	# Days >90°	# Days >90° Normal	# Days >90° Dep
Jul-98	90.7	4.0	16	8	18	12.4	6
Aug-98	88.9	2.2	13	8	14	11.5	3
Jul-99	83.3	-3.4	4	2	7	12.4	-5
Aug-99	86.0	-0.7	10	2	14	11.5	3
Jul-00	85.6	-1.1	4	2	10	12.4	-2.4
Aug-00	84.8	-1.3	8	0	11	11.5	-0.5
Jul-01	86.1	-0.6	6	4	11	12.4	-1.4
Aug-01	87.7	1.6	11	5	14	11.5	2.5
Jul-02	89.0	2.3	11	5	15	12.4	2.6
Aug-02	85.8	-0.3	6	3	8	11.5	-3.5
Jul-03	91.2	4.5	14	9	18	12.4	5.6
Aug-03	87.6	1.5	6	2	10	11.5	-1.5
Jul-04	89.5	2.8	12	5	17	12.4	4.6
Aug-04	87.5	1.4	14	6	16	11.5	4.5
Jul-05	88.0	1.3	9	3	14	12.4	1.6
Aug-05	89.0	2.9	13	3	16	11.5	4.5
Jul-06	91.3	4.5	15	11	18	12.4	5.6
Aug-06	87.5	1.4	7	4	11	11.5	-0.5
Jul-07	91.5	4.7	15	8	20	12.4	7.6
Aug-07	84.5	-1.6	6	2	6	11.5	-5.5
Jul-08	88.1	1.4	8	3	11	12.4	-1.4
Aug-08	84.7	-1.4	8	4	10	11.5	-1.5
Jul-09	91.6	4.9	16	10	22	12.4	9.6
Aug-09	88.3	2.2	13	7	12	11.5	0.5
Jul-10	87.6	0.9	10	2	18	12.4	5.6
Aug-10	84.5	-1.5	7	1	12	11.5	0.5

In general the daily maximum air temperature in the period 1998-2010 was warmer than during the normal period of 1971-2000. However, the daily maximum air temperatures at the Wenatchee airport were cool in 2010 with August's average daily maximum 1.5 degrees cooler than normal. On the other hand 2009 was warmer than normal with July's average daily maximum air temp 5 degrees warmer than normal. 2007, 2006, and 2003 all were warm years with a 5 degree increase in mean daily high temperatures in July in each year. 2008 and 2000 were cool years. During the period July was much more likely than August to have higher max air temperatures than normal.

Summer baseflows are another component of stream temperatures that varies from year to year. Baseflow is in turn dependant on how much snow fell in the mountains over the winter and then the rate at which it melted over the spring/summer. The Wenatchee River's annual and July/August flow departures from

average conditions over the period 1998-2010 are shown in the table below. There are more low flow years than above average years. The lowest summer flows during this period are in 2005 and 2006, with the highest summer flows occurring in 1999. The below average summer flows and the higher than average maximum air temperatures have an amplified effect on maximum stream temperatures during July and August.

Wenatchee River	Avg Annual Flow 38,552 Cfs	Avg Monthly Flow 4310 Cfs		Avg Monthly Flow 1420 Cfs	
	Annual	July	July	August	August
Year	Departure (cfs)	Departure (cfs)	Proportion Dep from Mean	Departure (cfs)	Proportion Dep from Mean
1998	-3,941	-1,483	-0.34	-578	-0.41
1999	17,207	5,385	1.25	2,565	1.81
2000	-4,435	-33	-0.01	-90	-0.06
2001	-17,246	-2,663	-0.62	-804	-0.57
2002	3,162	1,602	0.37	79	0.06
2003	-2,730	-1,933	-0.45	-688	-0.48
2004	-4,664	-2,573	-0.60	-560	-0.39
2005	-14,785	-3,295	-0.76	-995	-0.70
2006	3,925	-654	-0.15	-681	-0.48
2007	1,474	-713	-0.17	-533	-0.38
2008	-2,348	565	0.13	-146	-0.10
2009	-5,384	-1,759	-0.41	-611	-0.43
2010	-2,517	238	0.06	-96	-0.07

If maximum air temperatures are high then maximum stream temperatures will be high as well. The lower the streamflow, then the more impact the high air temperatures will have on stream temperatures. Likewise if maximum air temperatures are cool then maximum stream temperatures will be cool and with high flows muting the size of the air temperature effect. So how well can you use monthly air temperature values from one airport many miles away from most sites and baseflow for one river in one subbasin to estimate the size and direction of the 7DAMWT deviations for the 71 temperature sites? In the water temperature table above, the last 2 lines represent predictions of these deviations. The 2 lines above those summarize the air temperature and baseflow deviations for July and August. In each cell the comma separates conditions for the 2 months. A minus sign indicates a below average condition (cooler or less flow) and the number of symbols shows the size of the effect. A zero represents average conditions. For the predictions using both months, the month with the most extreme conditions was used. The warmer the air temperature and the lower the flows, then the higher the predicted 7DAMWT for that year. Cool air temperatures and high flows would have predicted a cooler than average 7DAMWT. Here is an example: 2002 had warm then slightly below average maximum air temperatures combined with above average flows in July and near normal flows in August. The both month prediction would have used July's higher air temperatures and predicted warm stream temperatures. August's prediction would be for slightly cooler than average stream temperatures based on air temps. In this case August predictions were correct and both months predictions were incorrect. The only misprediction for August occurred in 2006, but there were a total of 5 mispredictions for the both-month model. The both-month model missed when air/flow conditions were different between July and August and the more extreme situation

occurred in July, as in 2007. So the August model was essentially correct 10 out of 13 times. High stream temperatures are more sensitive to conditions in August and even air temperatures some distance from the site were useful. Global climate change has the potential to seriously alter water temperatures on the Forest and consequently impact cold-water-adapted aquatic life.

### Stream Habitat Surveys

In 2010 stream habitat surveys were completed on 11 miles of stream. All surveys were conducted using the Region 6 Level II Protocol (*USFS Stream Survey Handbook, Pacific Northwest Region 6, 2010*). In almost all reaches conditions have improved from that of earlier surveys.

## Recommendations

Continue monitoring these parameters.

## RANGELAND HEALTH

Monitoring Item

### Rangeland Health

The goal is provide opportunities to maintain and/or enhance desired plant communities and other resource values while permitting livestock grazing. The monitoring question is:

#### **Are rangeland health, desired plant communities and other resource values being maintained while permitting livestock grazing?**

The Wenatchee National Forest currently has 17 active allotments. The decline of active allotments is related primarily to the decline of timber harvest and the associated grazing of forested transitional rangeland and permittee retirements. There are 21 inactive allotments that should be evaluated for closure during Forest Plan revision. These inactive allotments no longer provide adequate forage and they would not meet current management goals if grazed by permitted livestock.

Most of the suitable rangeland on the Wenatchee National Forest is woodland with some small meadows, grassland, and riparian areas. Suitable range is defined as “range accessible to livestock and which can be grazed on a sustained yield basis without damage to the resource”. Woodland rangelands on the Forest have been going through a fair amount of successional change that in turn, results in less forage.

The results of the last few years of range utilization effectiveness monitoring indicate that the amount of available forage on the Wenatchee National Forest has been slowly declining. This decline in available forage has been validated by field reviews, watershed analysis, and NEPA assessments. Some of the major reasons for this decline are as follows:

Reduction of timber harvest activities providing transitory forage.

Successional recovery of areas where timber was previously harvested.

Successional recovery of historic fire areas.

Forest encroachment into meadows and grasslands.

Increased crown closure of woodland range sites.

Increased elk populations in the south half of the Forest.

Rangeland health on the Wenatchee National Forest has continued to improve through a focus on range administration. Range program personnel work with the permittees to administer the allotments according to the Forest Plan Standards and Guidelines, and the Aquatic Conservation Strategy of the Northwest Forest Plan. These Standards and Guidelines are incorporated into the Term Grazing Permits, discussions at annual operating instruction meetings and in the AOIs, Allotment Management Plan development from the NEPA Decision, and allotment field inspections.

The focus on administration of the range resource has resulted in a stable trend in most cases, and in some cases an upward trend of improved range health. Non-compliance issuances have been rare, and those that have been issued have been remedied within the timeframes in all cases but one. No Term Grazing Permits have been suspended or cancelled because of non-compliance. Because of this administrative focus, Range program managers are observing improvements in plant vigor, plant residual after the grazing period, desirable plant composition, and overall improvements to riparian areas. Areas that do not meet allowable forage utilization standards one year, are usually not repeated at the same site the following year.

Forage utilization in uplands and floodplains, and residual stubble height measurements on hydric plants along the streamside greenline are documented in key areas. Forage production over the past five years has been quite variable over the Forest. The Forest saw an increase in nonuse of range allotments by grazing permittees due to resource protection in wildfire areas, lower forage production and limited water availability in some years of drought, and waiver of Term Grazing Permits with either no preferred applicants to fill the allotment or vacating an allotment because of predators or other resource issues

During the past five years, condition and trend long-term monitoring sites have been reread on a schedule consistent with the Rescission Act for renewal of Range NEPA Allotment Management Plans. Many of these monitoring areas were originally established in the 1950's and 60's. Most of the rangeland condition and trends are maintaining or improving on the Forest. The Forest recognizes that there are rangeland and riparian areas that need improvement. An emphasis on rangeland analysis and administration is expected to continue in the upcoming years. Rangeland health is expected to continue to improve.

Utilization records indicate elk grazing is increasing on the Cle Elum and Naches Ranger Districts. Monitoring transects indicate a significant percent of available forage was used by elk prior to permitted livestock grazing. This means that in some areas, elk grazing alone has been exceeding Forest Plan Grazing Standards.

NEPA was completed in 2007 for the Soup Creek, Tieton, and Conrad Meadows Cattle Allotments. In 2010, NEPA was completed on the Swauk Sheep Allotment. The Allotment Management Plans for these allotments include standards and guidelines to assist in maintenance or improvement of riparian and

upland range conditions identified in the desired conditions description of the proposed action.

Completion of the Revised Forest Plan for the Okanogan-Wenatchee National Forest will provide guidance for the remaining sheep allotments requiring NEPA. Funding is the biggest challenge for the range analysis to be completed the first year and the environmental document to be written the second year after the analysis is complete. Good progress has been made on preparing range allotment NEPA decisions. Appeals and litigation are not planned funding allocations, and often resources are diverted from analysis to respond to appeals and litigation.

## **Recommendations**

Continue to implement utilization monitoring for the active grazing allotments.

Continue to develop a monitoring agreement with WDFW on the bighorn sheep herds. Agreement should include habitat effectiveness, bighorn sheep ranges, and permitted sheep operational use of the allotments that border these bighorn sheep range.

Develop a plan to resolve livestock and wildlife concerns on the Cle Elum and Naches Ranger Districts, coordinate with WDFW to determine forage carrying capacity for livestock and elk, initiate management actions to balance annual forage production with grazing use, and monitor key use areas to evaluate changes in range condition.

Continue to adjust grazing strategies to reduce grazing effects on other resources. Changes or modifications to attain Forest Plan objective are made through Term Grazing Permit administration for compliance with utilization standards and guidelines. Where current actions are not obtaining desired results, make changes through adaptive management.

Continue to complete range analysis surveys for NEPA decisions and allotment management plan updates.

## **INVASIVE SPECIES**

Monitoring Item

### **Management of Competing and Unwanted Vegetation**

The Wenatchee National Forest has implemented a Noxious Weed Prevention and Management plan that initiates a variety of prevention practices to reduce the spread of noxious weeds. Such things as public awareness, weed-free feed requirements, and equipment cleaning are part of this prevention effort. In addition, recent changes in the invasives plant program management focus on outcome-based accomplishment. In order to receive outcome-based accomplishment for treating invasive species, the forests must now document that a minimum of 50% of those acres treated were monitored for treatment effectiveness.

Integrated Weed Management includes a variety of ways to manage weeds including:

Prevention - Take proactive approaches to manage all National Forest System lands and waters in a manner to protect native terrestrial and aquatic ecosystems from the introduction and / or establishment of invasive species.

Early Detection and Rapid Response - Inventory and survey all National Forest System lands and waters so as to quickly detect invasive species infestations and implement immediate and specific actions to eradicate those invasive species infestations before they become established and spread.

Control - Implement integrated pest management activities on all lands and waters administered as part of the National Forest System to contain and control established invasive species infestations and limit their adverse effects on native terrestrial and aquatic ecosystems.

Restoration and Rehabilitation – Pro-actively manage National Forest System lands and waters such that they are self-sustaining and resistant to the establishment of invasive species, and implement restoration, rehabilitation, and/or re-vegetation activities following invasive species treatments that will prevent or reduce the likelihood of the reoccurrence or spread of terrestrial and aquatic invasive species.

Monitoring – The Invasive Plant Program includes the collection of data for condition and trend of invasive infestations, treatment implementation and effectiveness, and validation of prevention and treatment strategies.

Year	Acres Treated
2006	Not available
2007	1,649
2008	2,377
2009	3,128
2010	3,281

Most of the acreage treated for weed control was with the judicious use of herbicide since they are effective and have a low cost. Other important tools in the weed control toolbox included manual controls, biological controls, and revegetation. Hundreds of acres were hand pulled. Mowing was sometimes used to keep weeds from producing seed.

Acres are inventoried and treated with a variety of funds. Partners include the Chelan County PUD, Chelan County Noxious Weed Board, Washington State Noxious Weed Board, Washington State Department of Agriculture, National Park Service, private land owners, WSDOT, Lake Easton State Parks, Land Conservancy, Kittitas County Noxious Weed Board, Washington Department of Fish and Wildlife, Bonneville Power Administration, Puget Sound Electricity, Washington State Department of Ecology, and Yakima County Weed Board.

#### Prevention and Treatment Standards

The Forest has implemented the Regional Programmatic EIS and ROD for Invasive Plants that amended every forest plan in the region. New prevention and treatment standards include:

Vehicle washing is required to clean all heavy equipment leaving the road prism prior to entering NFS land.

Weed free straw mulch is required for mulch and rehabilitation uses

Use of pelletized and /or certified weed free livestock feed is required on all National Forest System lands.

Grazing – requires prevention practices to be incorporated into administrative mechanisms of the Allotment Management Plans, Term Grazing Permits, and Annual Operating Instructions.

Quarries – inspect sites before use; use only gravel, fill, sand and rock that is judged to be weed free.

Roads –road blading and ditch cleaning are conducted in consultation with local weed specialists for timing activities to reduce spread of weeds.

Prioritize infestations for treatment. Develop long-term site strategy.

Use native plant species in revegetation unless conditions warrant other choices.

Use only APHIS / State approved biological controls and those without negative impacts to non-target species.

Herbicide applications are performed or supervised by a licensed applicator.

Minimize negative effects to non-target species and water quality:

Design treatments to minimize or eliminate adverse effects to Threatened & Endangered species. Use site specific project design; provide a 300-foot buffer for aerial application near campgrounds and private land; No application in municipal watersheds.

Timely public notification and signing prior to implementation of herbicide projects is required.

## **Recommendations**

Evaluate use of any new standards above for plan monitoring and implementation as appropriate. Monitor effectiveness of weed free feed/straw regulations and signing that communicates the new regulations to the stock-using public. Monitor the effectiveness of weed free gravel in timber and engineering projects.

Establish key/indicator drainages/areas that can be assessed every 3 years to monitor the status of invasive plants treatments and prioritize watersheds for restoration.

# FOREST FIRE PROTECTION

Monitoring Item

## Forest Fire Protection

The goal is to provide protection from wildland fires for Wenatchee National Forest users, facilities, and resources in a safe and efficient manner. The monitoring question is:

### **Do implemented fire suppression strategies adequately protect the public, facilities and forest resources?**

The Forest experienced a total of 103 starts, which is up from the 5 year average of 96 fires. The 21,811 acres burned was well above the average for the last 5 years of 13,328 acres. Lightning still accounts for the majority (59%) of the fire starts (61) and human caused starts for the remaining 42 fires. Wenatchee National Forest employees supported fire suppression efforts in Region 6 as well as other regions in the National Forest System.

The first statistical fire of the season occurred on March 26, which was escaped campfire. The Forest experienced 2 large fires. The Swakane fire was managed by the FS and WADNR in early July. The other large fire was actually a complex of lightning fires managed by the FS and WADNR at the first of August.

Continued emphasis was placed on our interagency programs that enhance our efficiency and effectiveness. The Forest continues to participate in the Central Washington Interagency Communication Center (CWICC), to support and staff fire suppression crews and engines, participate in the Eastern Washington Wildland Fire Coordinating Group, and develop IMTs in partnership with the State of Washington Department of Natural Resources and other federal agencies.

### Fire Ignitions by Cause

	2010		5 Yr. Avg	
	No. of Fires	Acres	No. of Fires	Acres
Lightning	61	2,503	45	5,728
Equipment	2	0	2	275
Smoking	1	0	1	144
Campfire	24	2	28	1,807
Debris Burn	1	0	3	403
Incendiary	4	1	3	1
Children	0	0	0	16
Misc.	10	19,305	13	4,954

## Recommendations

Results are okay, natural ignitions cannot be controlled. There is a need to increase the number of local Initial Attack resources. There is still a need to pursue investigations of human fire starts in order to determine cause. The Forest continues to have a need for qualified Fire Investigators. The Forest needs to increase the prevention message with regard to campfire use. Escaped campfires still account for a large portion of the statistical fires on the Forest.

## Monitoring Item

### **Use of Prescribed Fire**

The goal is to continue to provide the appropriate, efficient and safe use of prescribed fire in support of the Fire and Fuels program, on the Wenatchee National Forest. The monitoring questions are:

**Are the acres being treated with prescribed fire meeting expected resource management objectives?**

**Are forest fuel loadings exceeding natural levels and therefore placing forest users, improvements and/or resource values at risk?**

About 80% of the dry forest lands on the forest are exceeding natural levels, which place forest users, improvements and resource values at risk.

The use of fire as tool to manage unwanted vegetation and debris, to prepare areas for tree planting, and to improve wildlife habitat continue to play a significant role in the fire program. In 2010, 13,937 acres were treated by prescribed fire.

The Forest successfully implemented prescribed burns that met resource management objectives and reduced fuel loadings. Since the 2009 summer prescribed fire, we have not been able to repeat our success do to the lack of smoke approvals. Getting burn approval will continue to be an issue until prescribed fire is given the same emphasis as wildfire with regard to smoke. With today's increased awareness about fuel loadings and stand densities in excess of historical conditions, in the Wildland Urban Interface (WUI), we will continue to prioritize our treatments to occur in the WUI. The Forest is looking for ways to increase the use of prescribed fire, however issues such as smoke and the human health hazards associated with it are raising questions that will need to be answered.

Wildland Fire Use in wilderness was replaced with managing wildfire for multiple objectives. With this change we are unable to account for fires that used to be showing as WFU's are now just another wildfire. Every fire start within the wilderness is still evaluated as to its suitability or not. However, now we no longer have any documentation that is required (use to have the Go/No Go checklist).

### **Recommendations**

Work with agency partners on ways to further increase the use of prescribed fire within the Wildland Urban Interface. Continue to work with the regulatory agencies on smoke issues.

Continue to evaluate all natural ignitions in the Wilderness for suitability for meeting multiple objectives. Encourage the development of Modules on the Forest to help manage multiple objective fires, and develop the analytical skills needed for long term risk assessments.

## IV. FOREST PLANNING UPDATE

### Wenatchee Forest Plan Amendments

AMENDMENT	DATE	LOCATION	DESCRIPTION
Amendment 1	10/90	Forest-wide	Amendment by Secretary of Agriculture vacating ROD for Northwest Regional Guide Supplement, and returning Spotted Owl Habitat Areas (SOHAs) to the land classification of the adjacent land
Amendment 2	03/92	Forest-wide	ROD signed by Regional Forester (Region 6) for FEIS on Management of the Northern Spotted Owl in the National Forests, which directed each National Forest to insure that all management activities are consistent with the management directions adopted by the ROD.
Amendment 3	05/92	Forest-wide	General corrections and definitions made or added to the 1990 Forest Plan
Amendment 4	06/92	Sec. 16 T22N, R11E	Site-specific amendment for reallocation of 300 acres in the Snoqualmie Pass (Ski Acres) area from ST-1 Scenic Travel, Retention, to RE-1 Developed Recreation. This amendment was later rescinded.
Amendment 5	07/92	Sec. 20 & 21 T28N, R 21E	Site-specific amendment to modify the VQO on 5 acres in the RE-3 allocation from Retention to Modification, and to allow harvest and disposal of trees for the purpose of constructing a flood control debris channel on Slide Ridge.
Amendment 5	10/92	Forest-wide	[Note: there was a duplication of amendment numbers.] Adjustments to the Activity Schedules provided in the 1990 Forest Plan.
Amendment 6	07/95	T.7N, R19-21E Multiple Sections	Site-specific amendment to assign allocations to lands within the Bear-Potato Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 7	07/95	Sec. 27 & 35 T.2 5N, R.17E.	Site-specific amendment to assign allocations to lands within the Freund Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 8	07/95	Section 27 T24N, R17E	Site-specific amendment to assign allocations to lands within the Boundary Butte Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 9	09/95	Multiple Sections T24-25N, R17E	Site-specific amendment to assign allocations to lands within the Tumwater Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.

AMENDMENT	DATE	LOCATION	DESCRIPTION
Amendment 10	10/95	Multiple Sections, T24N, R16-17E	Site-specific amendment to assign allocations to lands within the Eightmile Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 11	02/96	Section 16, T26-27N, R19E	Site-specific amendment to assign allocations to lands within the Tye Ridge Wildfire Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 12	04/96	Multiple Sections, T25N, R20E	Site-specific amendment to assign allocations to lands within the Roaring-Mills project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 13	04/96	Multiple Sections, T 24-25N R19-20E	Authorization of grazing on a temporary pasture outside an existing livestock allotment.
Amendment 14	02/97	Multiple Sections, T 27N, R.18-19E.	Site-specific amendment to assign allocations to lands within the Mad-Hornet Wildlife Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 15	01/98	Eldorado Creek, portions of North Fork Teanaway River watershed, and portion of upper Beverly Creek, Cle Elum RD, Kittitas Co.	Change Eldorado Creek RNA from a candidate RNA to an established RNA.
Amendment 16	06/97	Fish Lake Bog, Lake Wenatchee RD, Chelan Co.	Establishment of Fish Lake Bog RNA
Amendment 17	11/97	Snoqualmie Pass AMA (I-90 Corridor)	Establishment of standards and guidelines and management direction for the Snoqualmie Pass AMA as directed by the Northwest Forest Plan amendment
Amendment 18	09/98	Section 22, T22N, R19E	Site-specific amendment to assign an allocation to a parcel of land within the Sand Ecosystem Restoration project area acquired by the Forest Service since publication of the Forest Plan. The parcel was allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 19	09/98	Section 12, T21N, R13E Section 36, T22N, R11E Section 8, T19N, R13E	Site-specific amendment to allow for wetland crossings by access road segments to private inholdings where no other options exist.

AMENDMENT	DATE	LOCATION	DESCRIPTION
Amendment 20	09/99	Section 22, T27N, R17E	Site-specific amendment to adjust allocation line between Matrix allocation and SI-2 allocation to coincide with natural topographic features, forest stand habitat conditions, and an existing county road.
Amendment 21	07/99	Multiple Sections, T18-20N R12-15E	Forest Plan amendment to assign allocations to lands acquired from Plum Creek Timber Company as part of the legislated I-90 Land Exchange.
Amendment 22	04/94	Forest-wide	Northwest Forest Plan Amendment of the Wenatchee National Forest Plan
Amendment 23	01/01	Forest-wide	Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines of the Northwest Forest Plan Amendment. Amendment invalidated in Court.
Amendment 24	05/03	E1/2 SE1/4 Sec. 11, T26N, R13 E. N1/2, SW1/4 Sec. 11, T26N., R13E (North of Chelan County line)	Site-specific amendment to assign the RE-1 Administratively Withdrawn Allocation to a parcel of land within the Skyline Ridge Communication Site project area, acquired by the Forest Service since publication of the 1990 Forest Plan.  Site-specific amendment as described above to assign RE-3 LSR Allocation to this parcel.
Amendment 25	10/05	Forest-wide	ROD signed by the Regional Forester for the Pacific Northwest Region Invasive Plant Program: Preventing and Managing Invasive Plants, replaces management direction for the management of competing and unwanted vegetation established in 1988 ROD for Managing Competing and Unwanted Vegetation and the 1989 Mediated Agreement for invasive plant management.
Amendment 26	07/07	Forest-wide	ROD signed by the Regional Forester To Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Forest Service Land and Resource Management Plans Within the Range of the Northern Spotted Owl.
Amendment 27	11/08	Summit-at-Snoqualmie Ski Area Sections 4, 5, 9, 15, 16, 21, T22N, R11E  Sections 28-32, T23N, R11E, Sections.	Re-allocates 397.01 acres within the Summit-at-Snoqualmie Ski Area on the Wenatchee National Forest from ST-1 (Scenery – retention) to RE-1 (Developed Recreation) in keeping with the current land use. In addition, the 17.01 acres added to special use permit area are reallocated from ST-1 to RE-1. These lands remain AMA under the Northwest Forest Plan.

# List of Preparers

- Mary Bean** Recreation, Trails and Wilderness Program Manager  
Recreation, Wilderness and Wild and Scenic Rivers
- Barbara Jackson** Forest Landscape Architect  
Scenery
- Powys Gadd** Forest Archeologist  
Cultural Resources
- Jesse McCarty** Wildlife Biologist  
Wildlife
- Pierre Dawson** Fisheries Biologist  
Watersheds and Aquatic Habitats
- Maura Laverty** Range Program Manager  
Range Health  
Invasive Species
- Rod Clausnitzer** Forest Botanist  
Invasive Species
- Randy Whitehall** Forest Fire Protection  
Use of Prescribed Fire