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Annual Report on the Wenatchee Land and Resource Management Plan:

Implementation and Monitoring for Fiscal Year 2005



Contents

I. INTRODUCTION	1
PURPOSE OF THE MONITORING REPORT	1
GENERAL INFORMATION	1
II. SUMMARY OF THE RECOMMENDED ACTIONS	2
III. INDIVIDUAL MONITORING ITEMS	9
A. RECREATION	9
Recreation Opportunity Spectrum (ROS)	9
Forest Trails	10
Management of Developed Recreation Facilities	11
B. WILD, SCENIC AND RECREATIONAL RIVERS	12
Wild, Scenic, and Recreational Rivers	12
C. SCENERY MANAGEMENT	12
Scenic Resource Objectives	12
Landscape Character Goals	14
D. WILDERNESS	14
Recreation Impacts on Wilderness Resources	14
E. CULTURAL RESOURCES (Heritage Resources)	15
Cultural and Historic Site Protection	15
Cultural and Historical Site Rehabilitation	17
American Indians and Their Culture	18
F. COORDINATION AND COMMUNICATIONS WITH INDIAN TRIBES	18
Coordination and Communications of Forest Programs with Indian Tribes	18
H. WILDLIFE	20
Management Indicator Species Habitat	20
Primary Cavity Excavators	20
American Marten	21
Landbirds	21
THREATENED AND ENDANGERED SPECIES	23
Northern Spotted Owl (<i>Strix Occidentalis Caurina</i>)	23
SURVEY AND MANAGE SPECIES	24
Chelan Mountain Snail	24
I. TIMBER AND RELATED SILVICULTURAL ACTIVITIES	25
J. SOIL, WATER, FISHERIES AND RELATED WATERSHED MANAGEMENT	26
STATUS OF MANAGEMENT INDICATOR SPECIES	26
Bull Trout	27
Steelhead	31
Riparian Watershed Standard Implementation Monitoring	32
"Respect the River" Program	33
Other watershed Restoration Projects	33
Watersheds and Aquatic Habitats	34
Sediment	34
Temperature	36

K. RANGELAND HEALTH	45
Rangeland Health.....	45
L. ROAD MANAGEMENT	48
Road Maintenance	48
M. FOREST FIRE PROTECTION.....	49
Use Of Prescribed Fire	50
N. AIR RESOURCE MANAGEMENT	51
Long-term Trends in Air Quality.....	51
Long-term Trends In Air Quality.....	52
IV. FOREST PLANNING UPDATE.....	53
Forest Plan Amendments.....	53
LIST OF PREPARERS	56

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 followed, 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.

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.

	Continue Monitoring	Change Management Practices	Evaluation	Forest Plan Amendment or Revision	Recommendations
A. RECREATION					
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. WILD, SCENIC and RECREATIONAL RIVERS					
Wild, Scenic And Recreational Rivers	●				Continue monitoring as Scheduled

	Continue Monitoring	Change Management Practices	Evaluation	Forest Plan Amendment or Revision	Recommendations
C. SCENERY MANAGEMENT					
Scenic Resource Objectives	●				<p>Blewett Pass Highway 97 Viewshed Continue working with the Department of Transportation and permittees to minimize signs and structures, and for roadside improvements. Continue to monitor and enhance high scenic quality along the travel route.</p> <p>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.</p> <p>Shady Pass Forest Road 5900 Viewshed Maintain and enhance scenic quality while reducing fuels and improving forest health throughout the viewshed. Incorporate design arts into thinning projects to improve scenic quality. Future vegetation management along the viewshed should be designed to meet moderate to high scenic objectives. Varying stand densities, irregular spacing, clumping, and creating a variety of spaces (with contrasting variety and diversity of tree sizes) will enhance scenic quality.</p>
Landscape Character Goals	●				Continue monitoring, as schedule, projects in priority areas of High Scenic Concern.

	Continue Monitoring	Change Management Practices	Evaluation	Forest Plan Amendment or Revision	Recommendations
D. WILDERNESS					
Recreation Impacts on Wilderness Resources	●				Continue monitoring as scheduled. Work on application of Limits of Acceptable Change standards for wilderness management, particularly in the one-day travel zone.
E. CULTURAL RESOURCES					
Cultural and Historic Site Protection	●				Continue monitoring as scheduled. Continue to work on backlog of site evaluations.
Cultural and Historic Site Rehabilitation	●				Continue efforts as budget allows, to preserve and rehabilitate National Register eligible properties
F. COOPERATION OF FOREST PROGRAMS WITH INDIAN TRIBES					
Coordination and Communication of Forest Programs with Indian Tribes	●				Continue to promote notification and communication with tribal entities.
H. WILDLIFE					
Indicator Species: Primary Cavity Excavators	●				Re-sample within the fire and salvage logging study area during 2006 or 2007 to monitor snag attrition and the response of primary cavity excavators. Survey snags before and after timber harvest to determine if snag standards are being met.
Indicator Species: American Marten	●				Publish the results of the monitoring study in a peer-reviewed journal. Use the results of the monitoring study to develop a monitoring protocol in association with the revised Forest Plan.
Land Birds					Publish the results of the Pendleton Monitoring study in a peer-reviewed journal. Publish the findings from the Fire and Fire Surrogate Study in a peer-reviewed journal. Hold workshops to present the results of these studies and management recommendations to managers and interested publics in 2006 and 2007.

	Continue Monitoring	Change Management Practices	Evaluation	Forest Plan Amendment or Revision	Recommendations
Northern Spotted Owl	●				<p>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 2007 to track habitat trends.</p> <p>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.</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>
Survey and Manage Species: Chelan Mountain snail	●				<p>Implement the treatments to evaluate the effects of prescribe fire in dry forests on Chelan Mountain snail abundance.</p> <p>Continue to survey for Chelan Mountain snails using the results from the habitat associations study to guide survey priorities.</p>
I. TIMBER OFFERED, HARVESTED, and RELATED SILVICULTURAL ACTIVITIES					
TIMBER OFFERED, HARVESTED, And RELATED SILVICULTURAL ACTIVITIES					This item will no longer be included in the monitoring report. Information will be available electronically.
J. WATERSHEDS AND AQUATIC HABITATS					
Fish Management Indicator Species (MIS) Populations	●				Refer to section for multiple recommendations on several topics.
Riparian Watershed Standard Implementation Monitoring	●				Continue a variety of projects as funding and opportunities arise.

	Continue Monitoring	Change Management Practices	Evaluation	Forest Plan Amendment or Revision	Recommendations
K. RANGE HEALTH					
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. 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. Continue to complete range analysis surveys for NEPA decisions and allotment management plan updates.</p>
L. ROAD MANAGEMENT					
Road Maintenance	●				<p>Continue monitoring as scheduled. Continue Roads Analysis as outlined in the new Road Management Policy to determine the appropriate size and makeup of our existing road transportation system. Reduce maintenance levels and decommission (remove from the system) those roads determined to be no longer necessary.</p>

	Continue Monitoring	Change Management Practices	Evaluation	Forest Plan Amendment or Revision	Recommendations
N. FOREST FIRE PROTECTION					
Forest Fire Protection	●				Results are well within the historical averages for fire starts. The Forest does have a greater need for qualified Fire Investigators to determine the cause of fires other than those caused by lightning.
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 wilderness areas for suitability for Fire Use. Encourage the development of Fire Use Modules on the Forest, and develop the analytical skills needed for long term risk assessments.
O. AIR RESOURCE MANAGEMENT					
Air Quality	●				Continue to operate instruments as part of the national network of Class I visibility monitoring sites. Data from these sites will continue to be used as the Forest Service evaluates any new permits for emission sources.

III. INDIVIDUAL MONITORING ITEMS

A. RECREATION

Monitoring Item -

Recreation Opportunity Spectrum (ROS)

The goal is to provide a well-balanced array of recreation opportunities across the breadth of the Recreation Opportunity Spectrum (ROS) to meet the public demand for outdoor recreation.

The Forest Service has initiated National Visitor Use Surveys to measure recreation use on the National Forests. The Wenatchee National Forest was surveyed in 2001 and was resampled in 2005. The 2001 surveys for the Forest coincided with a very active fire season with dense smoke throughout the area. The Icicle Creek area, the north shore of Lake Chelan, and large parts of the neighboring Okanogan National Forest were closed to public entry for substantial periods of time during the summer. There was also a complete campfire closure for most of the summer. The 2005 surveys coincided with a dry winter with a short season and closures for downhill skiing. The snowmobiling and x-country skiing seasons started late and ended early. There was only one major fire located in the Lake Wenatchee area of the Wenatchee River District. This fire did put smoke into Leavenworth and did affect visits to some extent.

In 2001, the number of visits to the Forest totaled 2,532,617 and 2,130,800 in 2005. The wilderness visits were 300,584 in 2001 and 129,900 in 2005. This represented a drop of 401,817 visitors, with the decline in wilderness use representing 170,684 visits or 42% of the decline. The remainder of the drop was in winter activities, primarily focused on downhill skiing. The drop in winter activities is probably an isolated one year event due to low snow levels. The drop in wilderness visits appears to be part of a national trend. This will need to be monitored in future surveys.

The 2001 survey found that racial and ethnic composition was 76.9% white and 23.1% other races. The largest minority group was Hispanic at 11.1%. In the 2005 survey the composition was 93.7% white and 6.3% other races. The largest minority group was Hispanic at 5.6%. The difference in Hispanic numbers is probably due to sampling differences. In 2001, the survey sites were on the Naches and Wenatchee River Ranger Districts where there is greater use of the Forest by Hispanics. In 2005, the survey sites on the Cle Elum and Methow Valley Ranger Districts which have very low Hispanic recreational use.

The primary recreation activities in 2001 are compared to the primary activities in 2005 in the table below. The numbers represent a change in uses over the four year sampling period. Winter sports activities declined due to low snow year in 2005. The decline in picnicking was probably related to the decline in Hispanic use of the Forest. Most of the stream mileage in Chelan County is closed to fishing to allow for the recovery of endangered fish species. The large number of people fishing is a surprise.

2001 Activities		2005 activities	
Backpacking	16.7	Hiking and Walking	20.3
Developed Site Camping	10.9	Developed Site Camping	11.1
Driving	9.2	Relaxing	9.2
Downhill skiing	9.2	Fishing	6.4
Picnicking	7.8	Motorized Trail Activity	5.1
Cross Country Skiing	6.6		

Dispersed camping is an issue due to fishery and wildlife concerns. In 2001, dispersed camping represented 5.9% of all visits with 3.0% being the primary purpose. In 2005, dispersed camping represented 15% of visitor use but it was the primary purpose of use for less than 1.0%. It appears that dispersed camping is increasing, but as a means to another recreational activity rather than being the primary reason for visiting the Wenatchee National Forest.

The Wenatchee National Forest is known regionally as trail country. In 2001 trail use represented 34.2% of all forest visits. In 2005, trail use gained substantially to 39.2% of visits.

The following table shows percentage use for the primary trail activity:

Trail Activity	2001 Visitor Use	2005 Visitor Use
Backpacking	16.7%	4.1%
OHV's	1.3%	6.4%
Snowmobiles	4.2%	3.7%
Hiking/Walking	4.0%	20.2%
Horseback	.8%	1.1%
Bicycling	.6%	.6%
X-Country Skiing	6.7%	3.2%
Total	39.2%	34.2%

As noted in the last monitoring report, it is hard to get good trend data until several surveys are completed. The previous monitoring report stated that visitor use on the forest has been fairly steady. It appears that use has dropped since 2001, but that number is a relatively small drop, particularly if winter use rebounds as expected in a snowy year.

The Wenatchee National Forest recreation program is well balanced throughout all recreation activities throughout the year. There is no longer an off-season on the Wenatchee National Forest.

Recommendations

Continue monitoring as scheduled

Monitoring Item -

Forest Trails

The goal is to manage trail use to provide recreation opportunities in a wide range of recreation settings in harmony with other resource management objectives. The monitoring questions are:

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

The Wenatchee National Forest has over 4500 miles of trails; one of the largest trail systems in the nation. It is no surprise that over a third of the visitor use is related to some sort of trail recreation activity. Currently, the Forest clears about 3,000 miles of bare ground trail on annual basis. To maintain these trails to handbook standards requires additional work. At least the current level of maintenance allows public use of the trail system. In 2005, funding for trail maintenance came from the following sources:

- Appropriated dollars 5.5%,
- IAC/Grant Programs 56.2%,
- Northwest Forest Pass 22.1%,
- Volunteers 16.2%.

The minimal maintenance on the trail system has not addressed the deferred maintenance needs. In 2005, these were estimated at 4.7 million dollars. In the future the Forest will have to address the size and maintenance standards for the summer trail system.

In addition, to the summer trail system the Forest has just over 1,000 miles of snowmobile trail, and about 150 miles of cross-country ski trail. Maintenance of these trail systems are primarily through user fees. The fees cover maintenance costs, but not administrative and operational costs for managing the winter trail program.

Recommendations

Continue efforts to address the deferred maintenance on the trail system.

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 Forest will be starting a Recreation Facilities Master Plan in April of 2007. This plan will look at over two hundred recreation facilities as to their future management. Each site will be ranked on the following criteria:

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

The Recreation Facilities Master Plan will result in facilities being more in line with the Forest niche or focus of the recreation program. This will help better serve a larger segment of the public. It will also allow the Forest to divert funds to address the deferred maintenance backlog on these sites. In 2000, the backlog for the Wenatchee National Forest was estimated at 2.5 million dollars.

Recommendations

Continue monitoring as scheduled.

B. WILD, SCENIC AND RECREATIONAL 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.

C. 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)?

The Wenatchee National Forest landscape architect reviewed projects in three view sheds to assess the potential cumulative effects of resource activities on scenery. The following areas are periodically reviewed: Blewett Pass Highway 97, White Pass Highway 12, and Shady Pass Forest Road 5900 viewsheds. Other viewsheds and projects are also reviewed. Scenic resource analyses on these viewsheds indicate that the viewsheds vary from natural appearing to an altered condition.

The White Pass viewshed was the only viewshed of the three to have a project in it. The viewshed is in a natural to slightly altered condition throughout the travel route along Highway 410. 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. Dog Lake Campground was redesigned and the scenic setting will improve as the new use patterns are established as new vegetation growth rehabilitates the old visual impacts. The scenic qualities of this viewshed are maintained at a very high level.

There were no new projects implemented over the last year in Blewett Pass (Highway 97) and Shady Pass viewsheds. Monitoring will continue on these viewsheds as future projects develop.

Projects Monitored in Other Viewsheds

The Silver Falls Trailhead Reconstruction was implemented in FY 2004 and 2005 in the Entiat Valley Viewshed. The Silver Falls Trailhead is located adjacent to the main access Forest Road 51. Phase 1 included re-designing the parking area, improving pedestrian safety, and upgrading recreation facilities. The improvements to the trailhead parking include a one way circulation pattern to separate standard vehicles from larger RV's and school buses, a safe pedestrian road crossing, new trail access to Silver Falls National Recreation Trail, a new toilet, information kiosk, parking barriers, and a rustic wooden guardrail to separate parking from the road. Cascadian Architectural style was used to design facilities and maintain a rustic look. Phase 2 included constructing the stone access steps and connector path from the trailhead to the trail. The project improved both the safety and the aesthetics of the facility and was an overall enhancement to the viewshed.

The Fischer Fire Recovery Project was implemented in 2005. The Fischer Fire Recovery Project area is viewed as a steeply dissected rolling mountainous landform on the south side of State Highway 2 and from the Peshastin and Dryden communities as background and as foreground and as middle ground from the tributary canyons. The upper elevations that were logged on Blag Mountain are visible as a middle ground view from the Highways 2 and 97 and parts of the rural interface located along the valley bottoms of the Wenatchee River and Peshastin Creek. Due to the distance of viewing and the topography breaks of dissected valleys and ridges to break up the salvage units, the treatments blend into the landscape well and met the Partial Retention to Modification Visual Quality Objective. The landscape character is mosaic and more open in character, there is visual evidence of a recent forest fire until time and reforestation efforts re-establish vegetation.

Recommendations

Blewett Pass Highway 97 Viewshed

Continue working with the Department of Transportation and permittees to minimize signs and structures, and for roadside improvements.

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.

Shady Pass Forest Road 5900 Viewshed

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

Incorporate design arts into thinning projects to improve scenic quality. Future vegetation management along the viewshed should be designed to meet moderate to high scenic objectives.

Varying stand densities, irregular spacing, clumping, and creating a variety of spaces (with contrasting variety and diversity of tree sizes) will enhance 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 a 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 viewshed. The viewshed is 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.

D. WILDERNESS

Monitoring Item-

Recreation Impacts on Wilderness Resources

The goal is to perpetuate wilderness character, natural ecological processes, and provide recreation opportunities appropriate in wilderness. 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 standards for solitude or primitive and unconfined recreation. The standard is that this trend should be stable or increasing. It appears that this standard is being met beyond the day use travel time area. Those areas with significant day use are showing increasing social contacts and less solitude. In the past five years, day use has grown significantly while, overnight trips continue to decline. The Forest is continuing to monitor this standard.

The Forest Plan has established standards to prevent degradation of the wilderness resource. The most difficult standard to meet has been the bare ground standard which is much smaller than typical size need for groups traveling in the wilderness. Bare ground disturbance is not expanding, but neither is it shrinking towards the standards at a rapid rate. Further monitoring and analysis is being done on this issue.

All the wildernesses areas are covered by fire plans that allow for the full range of management response to ignition. The most recent wildland fire use occurred on the Naches Ranger District in 2004 during the Dog Creek Fire. The fire cycle was restored on over 700 hundred acres in the William O. Douglas Wilderness Area.

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 allows for use of herbicides if necessary to control weed infestations. The Ranger District has been using a form of Tordon for selective spraying from backpack pumps in addition to hand pulling of common crupina.

The Alpine Lake Wilderness Area is the only wilderness with a formal monitoring station. Monitoring has been continuous for over a decade at this station. Other wilderness areas on the Forest are monitored on an informal basis.

Education plans specific to each wilderness have not been prepared. The Forest has an education program covering all facets that is generic to wilderness.

Outfitter and guide operating plans have been revised to reflect model wilderness practices and appreciation for wilderness. Most of the wilderness areas are now meeting this standard.

Recommendations

Continue monitoring social encounters, particularly in the one day travel zone of wilderness area.

E. 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?

For 2005, a total of 80 separate consultations occurred in compliance with Section 106 of the National Historic Preservation Act and in accordance with the 1997 Programmatic Memorandum of Agreement (PMOA) regarding cultural resource management on National Forests in the State of Washington. Of these consultations, 27 projects required Section 106 consultation with the Washington State Historic Preservation Officer (SHPO) and 53 project consultations were handled internally per the 1997 PMOA.

The number of large projects requiring concurrence by the State Historic Preservation Officer (SHPO) declined but the complexity of some large projects increased. The number of consultations for small projects with limited potential to affect historic properties remained steady.

Project planning acreage ranged from a high of 69,248 for the Pot Peak and Deep Harbor Fire Suppression Rehabilitation project on the Chelan Ranger District to less than one acre. Acreage inventoried for cultural resources totaled 1622 acres and varied from a high of 882 acres for a fuel

reduction project on the Cle Elum Ranger district to less than one acre for summer home improvements on the Naches Ranger District. When field inventory was conducted it generally involved less than 100 acres of survey. Projects requiring inventory included wildfires, prescribed burns, timber and salvage sales, grazing permit renewals, summer home improvements, and recreation and facilities-related projects. More than half of the projects requiring heritage support had little or no potential to affect cultural resources and included such activities as weed eradication, permit renewals, wetland restoration within existing stream-river systems, road decommissioning, easements, and thinning.

A total of 111 new cultural resource sites were documented. Most of the sites were located during inventories for fuel reduction and salvage-and timber sales within large planning areas. To the extent possible all sites within a project area of potential effect (APE) were evaluated. A total of 112 documented sites were formally evaluated for nomination to the National Register of Historic Places. This total included 13 previously documented but unevaluated sites. Of the sites/isolates evaluated, 24 were determined to be eligible and 88 were determined ineligible. Seven site evaluations were challenged by the SHPO. Five sites were determined eligible for the National Register by the Forest Service but SHPO did not concur. Each situation was discussed via phone with SHPO and SHPO recommendations were accepted. Two sites were determined ineligible by the Forest and SHPO did not concur. Additional documentation was provided to SHPO and she concurred with the Forest's evaluation. Just over 1800 sites and isolated finds have been documented on the Forest but over 800 remain to be evaluated. Funding, workload and staffing constraints make it difficult to evaluate sites outside a project area. Tackling some of the backlog is a hard target for 2006.

Site protection and heritage awareness was emphasized through eight separate events that included site tours, talks, displays, interpretive signage, newspaper articles, school and public presentations. A number of ranger district employees included heritage awareness in their own area-specific presentations. Three sites remain under site stewardship (Leavenworth Ski Hill, American Ski Bowl, and Red Top Lookout). Site stewards and site monitors contributed 104 volunteer hours to the heritage program. Their efforts included work on the American River Guard Station and work on the Leavenworth Ski Hill National Register Nomination.

Each Section 106 consultation included a management recommendation stipulating avoidance of historic properties and unevaluated cultural resources. Monitoring was stipulated for 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. Of the 27 case-by-case consultations in 2005, four undertakings lacked cultural resources, 20 undertakings had cultural resources that were to be avoided and three involved memorandums of agreement (MOAs) for adverse effect because the property owner (two recreational residences and one organizational camp) could not perform the undertaking in accordance with the Secretary of the Interior's Standards for Rehabilitation. Monitoring during a trail reconstruction project involving a number of cultural resources and one timber sale was required for two undertakings occurring within documented historic properties. Sites were effectively avoided but one site intrusion was discovered during post project monitoring of a salvage sale. The site was a peeled tree that was inadvertently cut. Occasionally an Appendix A or B activity would involve previously documented or newly documented cultural resources. In 2005, sites associated with Appendix A and B undertaking were all avoided. Three National Register listed properties were inspected for damage and condition assessments.

A programmatic agreement for the management of recreational residences and organizational camps on all National Forests in Washington State was further revised and submitted to SHPO for final comments. Finalization of the document is planned for FY 06. A Memorandum of Agreement (MOA) for

replacements of roofs at Holden Village included a stipulation that a site preservation plan be developed. That plan is under development by a consultant working for Holden Village.

Recommendations

Continue monitoring as scheduled.

Continue to work on backlog of site evaluations.

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 now has eight individual memorandums of agreement and memorandums of understanding that provide strict guidelines for managing and rehabilitating National Register and National Register eligible sites on the Forest. Six site restoration or rehabilitation projects were completed in FY 05 and include;

- Salmon La Sac Guard Station toilet and ground restoration- a Forest Highway Enhancement Grant
- Salmon La Sac C.C.C. shelter restoration and rehabilitation – funds were provided by a donor
- Red Top Lookout repainted from white to correct FS color scheme for the period of construction
- American River Guard Station rehabilitation for use as a public rental; in-kind window reconstruction and replacement by Flying H Youth ranch,
- Copper City Mining and Road rehabilitation and interpretation grant awarded
- Long Lake trail shelter restoration by volunteers

The Forest determined that restoration of a National Register eligible trail shelter in Wilderness was not compatible with wilderness values. An MOA was prepared and SHPO concurred. There was some public objection to the determination, but mitigation included preservation and restoration of a similar shelter.

Recommendations

Continue efforts as budget allows, to preserve and rehabilitate National Register eligible properties

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?

Recommendations

Continue work to resolve process issues with the Confederated Tribes of the Colville Reservation.

F. COORDINATION AND COMMUNICATIONS OF FOREST PROGRAMS WITH INDIAN TRIBES

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? 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?

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

The Wenatchee National Forest is sensitive to American Indian concerns and issues regarding reserved rights on ceded lands. The Forest recognizes and honors the 1855 Treaty signed with the confederated tribes and bands of the Yakama Indian Nation. Government-to-government consultation remains a critical element of the program.

A meeting to discuss government-to-government consultation protocol in 2002 indicated that our current process works well with the Yakama Nation but there is clearly a need to establish a better protocol/process with the Colville tribal historic preservation officer (THPO). The process for identifying Traditional Cultural Properties (TCPs) in particular remains problematic with the Colville THPO because of differences in opinion regarding who should provide TCP information and the process for obtaining it. The THPO requested revision of the Section 106 consultation process and a meeting date was established for October 2006.

The Forest values its relationship with the Yakama Nation and the Colville Confederated Tribes and recognition of Treaty Rights and Trust responsibilities are paramount in our day-to-day operation. Fees for special forest products are waived for tribal members and privacy is provided for ceremonial activities.

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 on a case-by-case basis for all projects involving a decision notice or decision memo. The government-to-government letters are very specific about how the agency will consider effects to cultural resources.

Government-to-government letters, in accordance with 36 CFR 800, were sent to tribes for 39 undertakings. In each letter the project was described, the type of NEPA document being prepared was disclosed and very specific information was provided about the area of potential effect (APE) and the type of consultation being proposed per this PMOA. Each letter sought information regarding resources of interest to tribes including traditional cultural properties (TCPs) and further stated that Tribal Historic Preservation Officers (THPOs) or appointed staff will be contacted immediately if a prefield literature review identifies a TCP or a potential TCP. Each letter stated that special arrangements will be made if and when sensitive information was provided. None of the tribes consulted provided information about TCPs.

The Forest consulted with both Tribes regarding two new national directives; the Special Forest Products Act and the Tribal Forest Protection Act. A gathering ordinance was drafted by the Confederate Colville Tribes and several meetings were held to discuss the document between the tribes and the Forest Service. The Memorandum of Understanding between the Yakama Indian Nation and the Forest Service continues to guide anadromous fish habitat management. The Yakama Indian Nation continues to participate in Provincial Advisory Committee activities for both the Eastern Washington Cascades Province and the Yakima Province.

The cultural committee contact for the Yakama Indian Nation expressed concern over a dispersed site restoration project and wanted a list of the vegetation to be planted. He said that the tribes were concerned that plants from outside the region would be planted and would not survive. The Forest Service responded to the Yakama letter with a phone call to the tribal contact. This was followed by a letter that included a plant list. No further comment was received. They also expressed concern over a thinning project for which no cultural resource survey was proposed. The agency responded to the Yakama letter via a phone call to the tribal contact and via a letter explaining why no survey was proposed along with a better map and a copy of the draft Section 106 report. The report demonstrated that previous surveys in the area had met current survey standards and that no sites were located where thinning was planned and that the project as managed had limited potential to affect sites. No further comments were received from the Yakama Nation.

Recommendations

Continue to promote notification and communication with tribal entities.

H. 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. One of these functions includes the creation of cavities that in turn provide habitat for a wide variety of other birds and mammals. To monitor primary cavity excavator populations and their habitat use, two large studies have been conducted. These include monitoring primary cavity excavators within stand replacement fires that occurred in 1994, and monitoring the effects of vegetation management on the retention levels of snag habitat. The study of primary cavity excavators within the burned areas was carried out in 1998 and 1999 and a summary of the results can be found in the 2003 Monitoring Report. More details of the study can be found in the paper that was published, which is available at the Forest Headquarters Office. This study was intended to monitor how primary cavity excavator populations responded to stand replacement fires and subsequent salvage logging. This study will be repeated during 2006 and 2007 to monitor the long term effects of fire and salvage logging on primary cavity excavators and their habitats.

Monitoring of Primary Cavity Excavator Habitats

The second 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 1,058 snags within four 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 Size (Inches DBH)	Mean Attrition Rate
6-10	48.1%
10-20	34.2%
>20	30.0%

Recommendations

Re-sample within the fire and salvage logging study area during 2006 or 2007 to monitor snag attrition and the response of primary cavity excavators.

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

Monitoring Item

American Marten

The goal is to maintain viable populations of American marten

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 and 2004, 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 final report has been completed (available at the Forest Headquarters) and the abstract from that report is provided below.

Monitoring American Marten on the East-side of the North Cascades of Washington

Abstract-We used track plates to monitor American marten over two field seasons in 2003 and 2004 to test the efficacy of applying this technique to Late-successional Reserves on the east-side of the North Cascade mountains. We stratified our sample area into wet and dry late-successional forest habitats in order to account for differences in habitat structure, disturbance regimes, and forest management strategies. We detected no marten during either year in the dry forest habitats. In the wet forest habitats, detection rates were 0.29 in 2003 and 0.73 in 2004. The latency to detection in the wet forest habitats was 5.5 (+3.1) days in 2003 and 5.6 (+3.8) days in 2004. The corrected probability of detection at a survey unit in the wet forest habitat was 0.26 in 2003 and 0.42 in 2004. We then used the variability from our 2 sample years to estimate sample size requirements for different levels of power to detect changes in our abundance indices. Our study indicates that conservation efforts for the American marten should be focused on the wet forest habitats. This information should be useful to managers in designing a long-term monitoring program for American marten.

Recommendations

Publish the results of the monitoring study in a peer-reviewed journal.

Use the results of the monitoring study to develop a 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 has become an important management issue on National Forest System lands in recent years. In 2000, the Forest Service developed the Landbird Strategic Plan that outlined our landbird conservation program. An important element of this program is the development of scientifically credible monitoring programs to understand how forest management activities may influence

landbird habitats and populations. On the Wenatchee National Forest, dry forest restoration has been the primary focus of the vegetation management program. Therefore, landbird monitoring efforts have been focused on understanding how dry site treatments may affect landbird habitats, abundance, foraging behavior, and nesting success. These monitoring efforts have been accomplished through two large monitoring studies; the Pendleton Study and the Fire and Fire Surrogate (FFS) Study.

The Pendleton Monitoring Study was designed and implemented in cooperation with the Wenatchee Forestry Sciences Lab. The pre-treatment bird monitoring occurred in 1996 and 1997. The thinning portions of the dry site restoration treatments were completed in 2000 and post-thinning monitoring was carried out in 2001. In 2003 and 2004 prescribed fire treatments were implemented and post-fire bird monitoring was completed in 2005. A summary report has been completed for the Pendleton Study and is available through the Forest Headquarters and the abstract from this report follows.

The FFS Monitoring Study is a cooperative effort with the Wenatchee National Forest, Wenatchee Forestry Sciences Lab, and the University of Washington. This is an interdisciplinary study with wildlife being one of the disciplines that is included. In the FFS, pre-treatment monitoring was carried out in 2000 and 2001. Post-treatment monitoring was completed in 2004 and 2005. A summary report from the FFS study is currently being developed.

Short-term Response of Landbirds to Ponderosa Pine Restoration

Abstract-We monitored the short-term response of land birds to forest restoration treatments in ponderosa pine forests located on the east-slope of the North Cascade Range. Restoration treatments were designed to create stand structure and composition similar to pre-settlement forests, which were influenced by a frequent fire regime. Overall, avian community composition was changed as a result of the treatments. Cassin's finch, chipping sparrow, and yellow-rumped warblers were found at higher densities in treated stands, whereas mountain chickadee, western tanager, and red-breasted nuthatches had higher densities in untreated stands. White-headed woodpeckers and western bluebirds were only detected in the treated stands. Brown-headed cowbirds showed no response to treatments. We detected changes in the density of four of five foraging guilds in response to restoration treatments. Tree seed eaters, low understory and ground insectivores, and aerial insectivores all increased in density in treated stands. Bark insectivores showed no density response to treatments. Tree foliage insectivore density was lower in treated than untreated stands. Overall avian density, density of neo-tropical migrants, and density of some focal species were higher in treated stands. Monitoring should be continued to understand the longer term (5-10 year) responses of land birds and to guide future forest restoration efforts.

Recommendations

Publish the results of the Pendleton Monitoring study in a peer-reviewed journal.

Publish the findings from the Fire and Fire Surrogate Study in a peer-reviewed journal.

Hold workshops to present the results of these studies and management recommendations to managers and interested publics in 2006 and 2007.

THREATENED AND ENDANGERED SPECIES

Monitoring Item –

Northern Spotted Owl (*Strix Occidentalis Caurina*)

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?

During 1991–2002, spotted owls were monitored through a cooperative effort that included the National Council for Air and Stream Improvement (NACSI), the Pacific Northwest Research Lab (PNW) for research purposes, or by the Wenatchee National Forest. Due to this partnership, 11 years of monitoring information on owls is available. Funding for this long-term monitoring study ended in 2002. Since then, 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. Progress reports are available through the Forest Headquarters Office or the Wenatchee Forestry Sciences lab.

A summary of northern spotted owl monitoring information

Fiscal Year	Total Activity Centers Monitored	Number of Young Fledged	Number of Young/ Activity Center
1991	170	98	0.6
1992	184	207	1.1
1993	200	38	0.2
1994	187	128	0.7
1995	150	74	0.5
1996	150	83	0.6
1997	NA	NA	NA
1998	141	NA	NA
1999	108	26	0.2
2000*	139	57	0.4
2001	198	59	0.3
2002	263	45	0.2
2003	127	39	0.3
2004	71	25	0.4
2005	30	19	0.6

*Does not include data from the Cle Elum Ranger District.

While the monitoring data presented in the above table suggests that spotted owl productivity (number of young/site) has remained relatively stable, other studies have shown sharp declines in the number of spotted owl sites (Forsman et al. 2002, Courtney et al. 2004, Anthony et al. 2004). These declines were

particularly evident in several of the Washington monitoring areas, including the Cle Elum site (Anthony et al. 2004). Causes of these declines remain difficult to determine but may include lag effects from prior harvest of suitable habitat, competition with barred owls, and habitat loss due to wildfire.

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 2007 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 during 2004-2006.

SURVEY AND MANAGE SPECIES

Monitoring Item -

Chelan Mountain Snail

The goal is to provide for viable populations of the Chelan Mountain snail. The monitoring questions are:

What are the habitat relationships of the Chelan Mountain Snail?

How do dry forest restoration treatments affect the Chelan Mountain snail?

The Chelan Mountain snail 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 initiated in 2005 and is expected to be completed in 2007 or 2008 looking into the effects of prescribed burning on the abundance of Chelan Mountain snails.

Chelan Mountain Snail Habitat Associations

A final report has been peer-reviewed and published and is available through the Wenatchee Forest Headquarters. The abstract from this report is provided below.

Predicting the Occurrence of a Rare Mollusk in the Dry Forests of North-central Washington
Abstract-We used information from all of the sites in which Chelan Mountain snail is known to occur (N=79) to characterize their macro-habitat, distribution, and to develop predictive maps of their likely occurrence. Chelan Mountain snails were most often located in areas that had >10% tree canopy closure, <1000 meters in elevation, and on slopes <30 degrees. They were not found on true south-facing slopes and occurred most often in Douglas-fir series forests. This provides the best characterization of their habitat

currently available. Our predictive maps showed that 18% of the study area had a high relative probability of Chelan Mountain snail occurrence, 35% moderate, and 47% low to very low. These results can be used to prioritize areas for surveys and to identify locations on the landscape where managers would need to carefully evaluate the effects of management activities on the Chelan Mountain snail.

Recommendations

Implement the treatments to evaluate the effects of prescribe fire in dry forests on Chelan Mountain snail abundance.

Continue to survey for Chelan Mountain snails using the results from the habitat associations study to guide survey priorities.

I. TIMBER AND RELATED SILVICULTURAL ACTIVITIES

During FY 2003, the Forest reviewed monitoring items in the Wenatchee National Forest Land and Resource Management Plan (LRMP). Several items were redundant with other reports that are available to the public. For example, harvest (cut and sold) is reported in annual attainment reports as well as in the Timber Sale Statement of Accounts. Reforestation is reported annually in the growth and survival report which is sent to Congress. Other items that were monitoring report items in the LRMP are no longer relevant. Management of the Wenatchee National Forest has been significantly modified since 1994, when the President's Northwest Forest Plan was approved and in 1995, when Regional Foresters Amendments No. 1 and 2 were signed. Neither the President's Northwest Forest Plan or Regional Foresters Amendments No. 1 or 2 resulted in a recalculation of Allowable Sale Quantities or an estimate of harvested acres. Current harvest practices differ substantially from what was anticipated and projected under the LRMP.

Several items contained in the LRMP for the Wenatchee National Forest were combined in 2003 to form a new monitoring element that describes change in Condition Class. Condition Class represents a measure of the change in vegetation and its propensity for supporting uncharacteristic wildfire compared to pre-settlement conditions. Change in Condition Class will be reported every five years, beginning in 2008.

Timber Sale Program Quantity and Allowable Sale Quantity

The volume sold and harvested for each national forest in Oregon and Washington is reported in various ways that are readily available to the public. Volume sold and harvested is reported for each quarter and annually by fiscal and calendar year on the world wide web. Cut and sold data for all recent years is available for review on the following website: <http://www.fs.fed.us/r6/nr/fp/CutSoldReports/>

Reforestation

Reforestation information for each national forest is published annually by the National Forest System and published on the Forest Service world wide website. The reports are published at: <http://www.fs.fed.us/forestmanagement/reports/reforest-tsi/>

Insects and Diseases

Aerial survey information for the annual insect detection surveys for Oregon and Washington are posted on the web at: <http://www.fs.fed.us/r6/nr/fid/data.shtml>. Insects, primarily bark beetles, continue to kill trees on large numbers of acres across the national forests. Western spruce budworm (WSBW), a defoliating insect, is causing increased defoliation of Douglas-fir forests on the Naches District. Forest conditions continue to favor increases in both bark beetles and defoliating insects.

Disease conditions were reviewed in the Forest Health Assessment: Okanogan and Wenatchee National Forests (Townsley, J., B. Gaines, J. Hadfield, R. Harrod, C. Mehmel, and E. Leyda. 2004. Forest Health Assessment: Okanogan and Wenatchee National Forests. Unpublished report. USDA Forest Service, Okanogan & Wenatchee National Forests. 104 p). Dwarf mistletoes are widespread, affecting trees in over half of the forest types. Root diseases are also widespread, but the effect is localized in pockets of infections. Root diseases and dwarf mistletoes increase slowly. Dry and mesic forest types are most affected.

Timber Harvest Unit Size, Shape, Distribution, and Location

2005 timber sales on the Cle Elum, Entiat, Wenatchee River, and Naches Districts were reviewed in the field by the Forest Silviculturist and District personnel. The Forest Silviculturist reviews sale area maps and acreage of all planned reforestation units associated with timber sales. Harvest units complied with Forest Plan direction. Harvest units generally avoided riparian areas.

Suitability for Timber Harvest

The existing Forest Plan for the Wenatchee National Forest determined which lands were suitable for timber harvest as described in 36 CFR 219.28 (a). Suitability of lands for timber harvest will be reviewed in the Forest Plan Revision.

Change in Condition Class

Changes in Condition Class will be reported beginning in Fiscal Year 2008, when sufficient data has been collected for meaningful analysis. Change in Condition Class will facilitate quantitative and well as qualitative comparisons of the effects of prescribed burning, wildfire, insects and diseases, and mechanical vegetation treatments.

J. SOIL, WATER, FISHERIES AND RELATED WATERSHED MANAGEMENT

Monitoring Item-

STATUS OF 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, and U.S. Fish and Wildlife Service (USFWS) in the Upper Columbia. Results of the final spring and summer Chinook and sockeye in the Wenatchee River are not available at this time. 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.

The Forest cooperates with the Washington Department of Fish and Wildlife (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, Wenatchee and Naches subbasins. In 2005, fish distribution surveys were completed on 33 miles of stream. By district, the streams surveyed were on the Entiat District: Entiat River, 8 miles, Mad River, 5 miles; and Naches District: Bumping River, 20 miles. Data from all surveys have been entered into the Forest's fish distribution database. Results of the Forest Service bull trout surveys and Forest Service steelhead surveys will be reported here as well as results obtained by other agency monitoring partners.

Bull Trout

Entiat District

The following information was obtained from the "2005 Bull Trout Spawning Survey of Mad River, (Index Reach from Young Creek to Jimmy Creek)" by Phil Archibald, and Emily Johnson, available from the Entiat Ranger District. This year's spawning survey results indicate that recovery of the bull trout population in the Mad River is occurring under the current environmental conditions and fishing regulations. Video counts of bull trout migrating through the adult fish ladders at Rocky Reach Dam and Rock Island Dam also provide evidence of recovery in bull trout populations in the mainstem Columbia River nearby. Additional future annual data are needed to further monitor the species and confirm the apparent upward trend of this population in the Mad River. The results from the 2005 survey (37 redds) was 35 percent greater than the 17-year average number of redds (27.4 redds per year). Bull trout may exhibit both annual and alternate year spawning. If alternate year spawning is a characteristic of the Mad River bull trout population, it could possibly explain the inter-annual ups-and-downs observed in redd counts since 1997.

The increase in numbers of bull trout redds can be attributed to the bull trout angling closure instituted in 1992 and the 1995-present total angling closure of the Mad River from mouth to Jimmy Creek. In the 1997 and 1998 versions of this report it was noted that: "Brown (1994) stated that the majority of first time adfluvial female bull trout spawners on the Wenatchee National Forest are five to seven years old. Accordingly, 1997 was the first year that recruits from the 1992 cohort, the first to be protected by

the angling closure, would begin to spawn. We believe that an increase in spawners as evidenced through increased redd counts over the next several years (1997-2001) would be a valid indicator of the success of angling closures to protect bull trout.” In addition, recruits from the 1995 cohort (the first to benefit from the more stringent total angling closure instituted that year) would begin to spawn in the year 2000. The post 1993 trend depicted in the table below appears to reaffirm these conclusions.

From 1992-1998, WDFW provided signs explaining the closure of the bull trout fishery were posted at each camp, trail intersection, and bridge along the Mad River from Pine Flat Campground to Maverick Saddle. These signs were replaced with WDFW provided “Closed Waters” signs at Tillicum Creek junction, Pine Flat Campground, and Maverick Saddle in 1999. This action was taken after public input indicated some confusion about the older bull trout closure signs. The interpretation by some was that the Mad River was closed to bull trout fishing but open to other trout fishing, despite the unequivocal published fishing regulations. Inevitably, some anglers are still unaware of or ignoring the fishing regulations.

Entiat District Specific Recommendations for Bulltrout

It is recommended that Washington Department of Fish Wildlife maintain the total angling closure on the Mad River, at least until an upward spawning trend is firmly established

Continue to monitor Mad River water temperature weekly beginning in August to determine best survey initiation date; encourage the continued participation of USFWS in this survey; and continue to fund this monitoring project at a level similar to 2005.

It is also recommended that the Entiat River continue to be surveyed from the USGS gaging station below Entiat Falls to Entiat Falls (0.25 miles).

In light of the June 10, 1998 listing of bull trout as a Threatened Species under the ESA, the angling closure may have been the most effective conservation measure available. Additionally, the angling closure will likely benefit other ESA listed species (steelhead and spring Chinook) in the lower Mad River. It is recommended that Bull trout Biological Assessments include the angling closure as an ongoing and previously instituted conservation measure for the species on the Wenatchee National Forest.

Wenatchee River District

Redd counts in 2005 show a 38% decrease from the 17-year average for spawning index reaches in the Chiwawa watershed; considering all surveyed reaches in the Chiwawa watershed, redd counts indicate a 28% decrease from the five-year average. Spikes and dips were observed in the redd count data with a trend for “dips” appearing approximately every four years. The last dip observed was 2001, which could be linked to a reduced spawning population due to the winter 1995/1996 rain on snow flood events, in addition to effects from a record draught year. It is possible that the 1995/1996 flood and 2001 drought may have cumulatively affected the number of second and third generation bull trout spawners in the Chiwawa watershed in 2005. In 2005, drought and low stream flow were experienced, which may also have affected the number of adult spawners returning to the watershed and the number of redds constructed, due perhaps to less stream width and available spawning gravels.

Cle Elum and Naches Districts

The Washington Department of Fish and Wildlife has the lead for monitoring bull trout populations in the Naches and Upper Yakima subbasins (Naches and Cle Elum Ranger Districts). Forest Service personnel assist with the surveys. The Yakima subbasin table below is provided by Eric Anderson, WDFW.

The status of bull trout populations in the Yakima River system is a concern. The Rimrock Lake, Bumping Lake, Kachess Lake, Keechelus Lake and Cle Elum Lake populations are isolated above dams. Only the Rimrock Lake populations (Indian Creek and South Fork Tieton River) appear to be strong, however, Indian Creek redd counts between 2004 and 2005 are about one-half the numbers observed between 1999 and 2000. The Bumping Lake population redd counts are variable, but at least the 2004-2005 are near the preceding 5-year average count. Bull trout populations in Kachess Lake and Keechelus Lake are small and access to spawning streams can be impeded by low flows due to reservoir drawdown. Low flows and blocked access due to drawdown are probably reasons for the low number of redds observed in Gold Creek. No good index area or concentrations of spawning fish have been observed in the Cle Elum River above Cle Elum Lake.

Redd counts in the Naches River tributaries of Rattlesnake Creek, American River and Crow Creek had been fairly stable, but in 2005, both Rattlesnake Creek and Crow Creek had large percentage declines from the previous 5-year averages. Cle Elum and Teanaway River populations appear to be very low.

With the exceptions of the Rimrock Lake and possibly the Bumping Lake populations, bull trout population numbers in the Yakima appear depressed and at risk of extinction.

A summary of bull trout redd (spawning area) counts in the Upper Columbia and in the Yakima Basin is presented in the two tables below.

**Bull trout redd (spawning areas) counts from streams
in the Upper Columbia Basin (data from USFWS and USFS)**

Stream/drainage	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Wenatchee Core Area																		
Peshastin watershed													0	1	5	9		
Chiwaukum River														29	35	42	23	31
Nason watershed									3	1	9	15	13	3	7	3	15	3
Chiwawa watershed		176	93	332	255	230	207	405	358	324	347	462	400	254	437	421	376	251
Chiwawa Index 11.0 mi		176	93	332	255	230	207	405	358	324	347	436	331	208	340	304	292	174
White/Little Wenatchee	32	33	7	37	26	45	48	26	29	18	35	44	65	22	123	64	54	59
Redd Total:	32	209	100	369	281	275	255	431	390	343	391	521	478	309	607	539	468	344
Miles Surveyed Total:	0.7	11.7	11.7	11.7	11.7	11.7	11.7	11.7	12.3	14.2	14.2	19.4	31.4	30.0	31.6	31.1	26.1	24.1
Entiat Core Area																		
Mad River		18	17	21	16	10	17	16	23	23	43	30	45	34	26	52	37	37
Entiat River							3	3	2	0	1	6	1	4	7	5	46	40
Redd Total:		18	17	21	16	10	20	19	25	23	44	36	46	38	33	57	83	77
Miles Surveyed Total:		7.5	7.5	7.5	7.5	7.5	7.8	7.8	7.5	7.5	7.5	7.5	7.8	7.8	7.8	7.8	12.4	11.3

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. 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 sub-basin, 1989-2005**

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Yakima River (F)																	
Keechelus to Easton Reach *												2	1		0		
Ahtanum Creek (R)																	
N.F. Ahtanum Cr.					9	14	6	5	7	5	7	11	20	17	12	8	6
M.F. Ahtanum Cr. *								1	1		0	10	1	6	8	11	5
S.F. Ahtanum Cr. *												5	14	13	7	5	3
Naches River (F)																	
Rattlesnake Cr. *		2				4	26	38	46	53	44	45	57	69	54	32	15
American R.								25	24	31	30	44	36	27	30	40	35
Crow Cr.											19	26	6	9	9	6	4
Rimrock Lake (AD)																	
S.F. Tieton R. *		32			38	167	95	233	177	142	161	144	158	141	190	180	205
Indian Cr. *	39	69	123	142	140	179	201	193	193	212	205	226	117	100	101	50	91
N.F. Tieton (above Clear Lk)*																1	
Bumping Lake (AD)																	
Deep Cr. *	17	15	84	78	45	12	101	46	126	98	107	147	51	120	57	97	73
Bumping River (upper)						1										0	
N.F. Teanaway River (F/R)																	
NF Teanaway/DeRoux Cr. *								2									2
Kachess Lake (AD)																	
Box Canyon Cr.	0	5	9	5	4	11	4	8	10	16	17	10	14	15	8	19	8
Kachess R (upper) *										0		15	14	0	16	8	3
Keechelus Lake (AD)																	
Gold Cr.	3	11	16	14	11	16	13	51	31	36	40	19	15	31	9	20	7
Cle Elum & Waptus Lks (AD)																	
Cle Elum R. (upper) *												0	0	0	0		
Summary	59	134	232	239	247	404	446	602	615	593	630	704	504	548	501	477	457

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

* Incomplete survey; index area not fully defined or adequately monitored: Yakima R. 2000-2001, M.F. Ahtanum 1996-2001, S.F. Ahtanum 2000, Rattlesnake 1990-1995, S.F. Tieton 1990-1993, Indian 1984-1987, Deep 1989-1990, N.F. Teanaway 1996-2002, Kachess 1998, 2005 Cle Elum 2000-2001, N.F. Tieton 2004.

Recommendations

It is recommended that Washington Department of Fish Wildlife maintain the total angling closure on the Mad River, at least until an upward spawning trend is firmly established. It is recommended that Bull trout Biological Assessments include the angling closure as an ongoing and previously instituted conservation measure for the species on the Wenatchee National Forest.

Steelhead

Entiat District

The following information was taken from the “2005 Mad River Rainbow/Steelhead Trout Spawning Surveys” report from the Entiat Ranger District. It is widely acknowledged among fishery biologists that spring spawning surveys can be unpredictable and difficult to replicate from year-to-year due to snow conditions, poor visibility due to turbidity, and rising stream flows. Steelhead spawning timing can also vary widely through the months of March through June depending on flow, temperature, and weather conditions. Regardless of these potential drawbacks, spring surveys in the Mad River and Roaring Creek were continued spring spawning surveys in the Mad River and Roaring Creek.

The results of the spawning ground surveys likely underestimated steelhead spawning in the Mad River in 2005. Increasing streamflow at the end of April and early-May precluded repeat surveys of the upper segment of the index reach between river miles 4.5 and 7.2. Spawning in this segment appeared to be just getting underway on April 20, 2005 when 5 fresh redds were observed there. Typically, this segment produces ten or more redds. Most of the definite redds observed between Mad River miles 1.1 and 5.6 were at locations where steelhead redds have been seen in previous years. The 2005 redd count is above the four-year average (35 redds/year) for the Mad River index reach (RM 1 to 7). Steelhead spawning in the Mad River appeared to peak during the month of April 2005, as expected from prior years observations.

Steelhead redd counts on the Mad River, 1997 through 2005

Year	1997	1998	1999	2000	2001	2002	2003	2004	2005
Definite Redds	8		3	8	17	17	44	35	45
RM surveyed	1 to 3	No survey	1 to 4	1 to 10	1 to 10	1 to 7	1 to 7	1 to 7	1 to 7

Entiat District Recommendations for Steelhead

With respect to the August 11, 1997 Endangered Species Act listing of Upper Columbia River steelhead, more and better information on this species is needed for quality Biological Assessments. It is recommended that spring spawning surveys be continued. Based on the results and knowledge gained during the past seven years of steelhead spawning surveys, it is recommended to establish an index reach on the Mad River between river miles 1 and 7. This Mad River index reach will be the primary focus in the future.

Continue to seek assistance from Washington Department of Fish and Wildlife and US Fish Wildlife Service Mid Columbia River Fish Resource Office to expand survey areas in (Entiat River) and increase survey frequency and continue implementation of a standardized survey protocol.

Wenatchee River District

Steelhead surveys were conducted at randomly-selected sites in Wenatchee basin 2004-05. The goal of the random-site surveys was to complement existing index reach steelhead surveys. In 2004-2005, random-site steelhead surveys described previously undocumented redd locations in Beaver Creek, Chumstick Creek, and Mission Creek. In mainstem Mission Creek, every 2004-05 random site sampled contained steelhead redds, suggesting Mission watershed might be a good candidate for an additional index survey in the less-documented lower Wenatchee basin. The addition of random-site steelhead surveys to existing index surveys enhances the ability to extrapolate from index reaches to the entire

Wenatchee basin, and assists understanding of the status and trend of natural steelhead spawning in Wenatchee basin.

Naches District

USFS Steelhead surveys conducted in the Naches River basin by the Forest Service are only in their second year. This year's numbers (shown in the table below) are a 150% increase over the numbers of redds seen in 2004. The program is too recent for any meaningful comparisons to be made.

Stream	Redds	Fish
Totals L. Naches	70	9
Totals Rattlesnake	26	4
Totals Bumping River	16	3
American River Totals	4	0
Lower Naches River	24	5
Total Naches River Basin	140	21

Recommendations

It is recommended that Washington Department of Fish Wildlife maintain the total angling closure on the Mad River, at least until an upward spawning trend is firmly established. It is recommended that Bull trout Biological Assessments include the angling closure as an ongoing and previously instituted conservation measure for the species on the Wenatchee National Forest.

Continue steelhead spawning surveys in the Mad River and establish an index reach.

Continue to seek partnerships with state and federal agencies to expand steelhead surveys in the Entiat River.

Consider continuing Mission Creek as a steelhead index survey location for the lower Wenatchee basin.

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 2005, approximately 60 miles of stream were enhanced or restored through projects with outside partners or with Forest involvement alone. This mileage number 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.

“Respect the River” Program

Cle Elum District

Riparian and watershed implementation monitoring focused on the “Respect the River” program. The “Respect the River” program was developed to maintain and restore riparian habitat that is being impacted by recreation use. The program combines restoration with public education to improve riparian habitat while providing for recreation use. A monitoring protocol has been developed to both inventory recreation sites adjacent to streams and track changes in habitat condition over time.

A total of 2 miles of restoration on North Fork Teanaway were completed which included restoration work and follow up maintenance on dispersed campsites.

Naches District

In 2005, contact rangers spoke to over 1200 recreationists about “river friendly camping” principles, removed tons of garbage from dispersed campsites, dismantled or breached over 50 play dams in streams. Interpretive signs were installed at campsites, and 40 campfire hearths were removed from streambanks. Hundreds of downed and standing dead trees along riverbanks were signed to prevent removal for campfire wood.

Other watershed Restoration Projects

Wenatchee River District

Project monitoring occurred to determine if mitigation measures identified in environmental assessment documents and Biological Assessments were included in project design and implementation. The Sand Creek culvert replacements, White River oxbow log jam projects, were reviewed on site.

Cle Elum District

41 miles of road on land received in a land exchange with Plum Creek Timber Co. were obliterated and another 1.5 miles were converted from road to trail. 12.3 miles of the obliterated roads were located in riparian reserves along streams. 85 culverts were removed at stream crossing and fill material was excavated to conform to natural contours. Roads were barricaded at their starting points with boulders and debris.

Naches District

Each year, excess hatchery fall Chinook salmon that return to the Washington Department of Fish and Wildlife’s Priest Rapids facility are frozen whole and stored until mid to late November. After fish are tested for disease, they are transported to the Upper Naches River drainage for dispersement. Approximately 40 cubic yards of frozen salmon were placed into the Little Naches, Bumping, and American Rivers by Forest Service and Washington Department of Fish and Wildlife biologists. The objective of the salmon carcass placement project is to enhance nutrient levels in river reaches that are key salmon and steelhead spawning areas. The purpose is to mimic the nutrient pulse that historically occurred when salmon runs to the Yakima River basin were much larger to these tributaries. Research indicates that nutrient inputs from decomposing salmon benefit their young salmon fry during the early stages of their development.

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 < 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 monitoring on the Entiat, Wenatchee River, Cle Elum and Naches Ranger Districts.

Entiat District

The following information was obtained from the “2005 Sediment Monitoring Report, Entiat River, Mad River” by Phil Archibald. The report is available from the Entiat Ranger District. This was the thirteenth consecutive year of evaluation of fine sediment conditions by the McNeil core sampling method in the Entiat River (RM 0.5-34) and the twelfth consecutive year for the lower Mad River.

In 2005, all four sampled Entiat River reaches and the Mad River were within the Forest Plan Standard for fine sediment. The results from four Entiat River reaches (48 samples) show sample mean percent fines <1.0 mm in salmonid spawning habitat were variable by reach with all four reaches increasing from 2004. Results from the Mad River (12 samples) indicate sample mean percent fines <1.0 mm in salmonid spawning habitat increased compared to last year. Sample mean percent fines <1.0 mm were 15.72 percent, 13.95 percent, 12.02 percent, and 15.60 percent in Entiat Reaches 1, 2, 3, and 4, respectively. Mad River Reach 1 sample mean percent fines <1.0 mm were 15.59 percent. The thirteen-year trend of fine sediment levels in the Entiat and Mad Rivers has been variable and may be explained by annual precipitation and runoff. Higher flows of longer duration tend to favor fine sediment transport rather than deposition. Water-year 2005 was relatively typical as depicted in the 2004-05 hydrograph. The atypical spike to 850 cubic feet per second (cfs) on January 19, 2005 may partially explain the sediment response in Reach 4 of the lower Entiat River.

Entiat District Recommendations

- It is recommended that sediment sampling be continued indefinitely in the Entiat River and Mad River drainages to (1) support future iterations of Watershed Analysis with time/trend data, (2) continue tracking the effects of a major wildfire in 1994, and (3) provide invaluable fine sediment data for Forest Plan revision, Biological Assessments for ESA-listed steelhead, spring Chinook salmon, and bull trout.
- It is recommended that sediment monitoring projects continue to be performed by Washington Conservation Corps (WCC) crews and 4H crews trained by experienced FS personnel to ensure sampling consistency

Cle Elum District

Three reaches on the North Fork Teanaway River and 1 reach on Swauk Creek were sampled for fine sediment levels. The results are not yet available at this time.

Naches District

The following information was taken from “Sediment Sampling Results from the Little Naches and South Fork Tieton River” report by Jim Matthews, Yakama Nation Fisheries Biologist, available from the Naches Ranger District.

Sediment monitoring was done using a McNeil gravel core sampler. Ten stream reaches in the Little Naches River drainage, and one reach in the S. Fork Teitton River drainage were sampled in 2005. The overall average fine sediment levels in the Little Naches were similar to 2004 and 2003, with a 2005 overall average percent fines <1.0 mm was 13.1% and the highest reach average of 16.3%. This marks four years of improving spawning conditions with the 2003-2005 period having the lowest average fine sediment levels by far since the start of the reach sampling in 1992. In the two reaches where sampling started in 1985, the 2005 average fine sediment levels are only two to four percentage points higher than the lowest values on record (1985-1986). In the South Fork Tieton, the 2005 reach average was similar to 2003-2004, and 2000-2001 with a value of approximately 15%.

The comparable conditions between these recent years may be due to very low flows with the past year's drought (little bedload movement or flushing) and/or relatively stable watershed conditions. The reason for the recently improved conditions is not fully understood. In the early 1990's overall average fine sediment levels in the Little Naches were quite high and peaked at 19.7% fines (<.85 mm) in 1993 due to the high levels of fine sediment at that time, considerable road improvement, abandonment, and drainage work was accomplished by landowners in 1994 and 1995. In addition, more protective measures were instituted for logging practice near streams through the Northwest Forest Plan (1994) and the Plum Creek Habitat Conservation Plan (1996). Possible explanations for the latest decline to current conditions are sediment abatement work on roads and trails, better logging practices, reduced precipitation and stream flows, and/or forest regrowth in previously harvested areas. These factors and others need to be compiled and analyzed to better understand factors affecting in-channel fine sediment levels.

Naches District Recommendations

- Further monitoring is needed to determine if the current conditions are part of a long-term trend or just a short-term change.
- Additional investigations of sediment sources and their contribution to the stream system is also very much needed. Without information on fine sediment delivery sources in the drainage, it will be difficult to manage and correct problem conditions. In particular, dispersed camping and off-road vehicle activities near streams, stream-adjacent roads, eroding banks, isolated unstable areas, and timber harvest should be evaluated for their delivery capability and effect on spawning conditions.

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), 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).

All districts participate in the water temperature monitoring program. At this time data analysis for 2005 has occurred on the Entiat, Chelan, Wenatchee River District, and the Cle Elum Ranger Districts

Entiat District

The following information was obtained from the “2005 Stream Temperature Monitoring Report Entiat and Chelan Ranger Districts” by Emily Johnson, Fishery Biologist. The complete report is available at the Entiat Ranger District.

2005 Stream Temperature Monitoring

A total of 3908 stream-days of water temperature monitoring were accomplished in 2005 compared with 4226 stream-days in 2004. Due to budget reductions, no thermographs were placed in Lake Chelan tributaries or minor tributaries to the Entiat River. Data from the USFWS Entiat Hatchery location contributed 333 stream-days to the temperature monitoring database in 2005.

2005 Water Temperature Monitoring Summary — Entiat District

Location	Monitor dates	# Days	# Days >64.4°F	# Days Avg 7-Day Max >58°F
Entiat River				
RM 1.4	1/1-2/24, ND 2/25-7/28, replaced 7/29-12/31	156+	42+	65+
RM 3.2	6/20-10/21	124	72	101
RM 5.8	6/20-10/21	124	65	92
RM 7.1	1/1-11/30	333	62	96
RM 8.5	6/20-10/21	124	64	96
RM 10.2	6/14-10/21	130	62	96
RM 10.8	6/14-10/21	130	62	100
RM 12.5	6/20-10/21	124	59	97
RM 15.0	6/20-10/21	124	51	92
RM 18	1/1-12/31	365	40	86
Total		1734	537	856
RM 21.1	6/20-10/13, dewatered 7/18-7/29	116	46	48
RM 24.1	stolen	0	0	0
RM 26	1/1-12/31	365	45	61
RM 30.5	6/20-9/28	101	20	45
RM 34.1	stolen, get DOE data	0	0	0
RM 38.2	6/20-9/28	101	0	0
Total		683	111	154
Mad River				
Location	Monitor dates	# Days	# Days > 61°F	# Days Avg 7-Day Max >58°F
Mouth of Mad River	6/3-10/5	125	65	80
Mad ^ Tillicum	1/1-3/8, stolen 3/9-8/1, replaced 8/2-12/31	219	63	82
Mad ^ Pine Flats C.G.	6/3-10/5	125	65	80
Mad ^ Hornet Cr	6/3-10/5	125	61	78
Mad ^ Windy Cr	6/4-11/2	142	34	61
Mad ^ Young	6/14-10/7	116	1	34
Mad ^ Cougar Cr	6/28-9/29	94	0	0
Mad ^ Berg Cr	6/28-10/11	106	0	0
Mad ^ Jimmy Cr	7/3-10/9	99	0	0
Mad ^ Blue Cr	7/3-10/23	113	24	43
Mouth of Mad Lake	7/4-10/22	111	64	69
Total		1375	377	527
Mad River Tributaries				
Location	Monitor dates	# Days	# Days > 61°F	# Days Avg 7-Day Max >58°F
Tillicum Creek	No data available yet			
Young Creek	6/14-10/7	116	0	0
Cougar Creek	6/28-9/29	94	0	0
Total		116	0	0
	Total Stream-Days	3908	488	1537

Exceedences and the Thermal Regime in the Entiat River

Daily maximum temperatures exceeded the 61°F Forest Standard on Class AA waters of the Entiat River at all thermograph locations except the Entiat River at Cottonwood Campground (RM 38.2). The 7-day average maximum stream temperature standard (< 58°F) was exceeded at the same stations. Also, the State temperature standard for Class A waters (< 64.4°F) was exceeded downstream at all 10 monitoring locations from RM 18 (near Stormy Creek) to the mouth. In 2005, exceedences upstream from RM 20 occurred from early July to early September. From RM 20 downstream, exceedences were of progressively longer duration, beginning in mid-June and continuing until mid-September.

2005 Entiat River longitudinal stream temperature monitoring results by week and elevation

Shown are weekly maximums in degrees F. Exceedences are noted within shaded boxes

Elev. (ft.)	RM	6/18 6/24	6/25 7/1	7/2 7/8	7/9 7/15	7/16 7/22	7/23 7/29	7/30 8/5	8/6 8/12	8/13 8/19	8/20 8/26	8/27 9/2	9/3 9/9	9/10 9/16	9/17 9/23	9/24 9/30	10/1 10/7
3100	RM 38.2	52.8	54.2	54.5	55	57.2	57.8	56.7	57.8	56.7	56.1	54.7	51.9	50	50.5	58.1	
2650	RM 34.1																
1950	RM 30.5	54.6	55.5	57.4	58.8	61.4	62.8	62	63.7	62.2	62	60.3	56.6	53.8	53.5	51.8	
1750	RM 26	57.4	58.8	59.7	61.7	64.6	66	65.4	66.6	65.1	65.1	63.4	60.3	57.7	57.1	55.8	50.2
1710	RM 24.1																
1640	RM 21.1	59.6	61.6	62.5	64.8	*	*	68.8	70.6	68.5	68.8	65.9	62.8	59.6	59.3	57.9	52.1
1580	RM 18	61.2	62.9	64	65.8	68.7	69.9	69.3	70.8	68.7	69	65.8	62.3	59.5	59.2	58.6	53.3
1480	RM 15	61.6	64.2	64.2	65.9	67.9	70.3	70.3	72.4	70.3	71.2	68.2	64.2	61.6	60.7	59.9	54
1365	RM 12.5	61.9	64.5	65.1	66.8	70	72.4	72.4	73.9	71.8	73	70.6	66.8	63.9	62.5	60.5	54.6
1265	RM 10.8	62.2	65.1	66	68.3	71.6	74	74	75.8	74	74.6	71.6	67.1	63.6	63.6	61.6	54.9
1250	RM 10.2	62.5	65.6	66.5	68.8	72.1	74.2	74.5	75.8	73.9	74.2	70.9	66.8	62.8	62.2	61	55.4
1150	RM 8.5	63.1	66	66.9	69.5	72.8	74.3	74.6	75.2	73.1	73.1	69.8	66.3	62.2	61.4	61.1	55.2
1150	RM 7.1	63.1	66	67.5	69.8	73.1	74	74.6	74.9	73.1	72.8	69.5	66.3	62.5	61.4	61.4	56
950	RM 5.3	63.4	66.3	67.5	69.8	72.8	73.7	74	74.9	72.5	72.2	69.8	65.7	62.2	61.4	60.8	56.3
820	RM 3.2	64.9	67.5	68.6	71	73.7	75.6	75.9	76.5	74.3	74	71.6	68.1	64.6	63.7	62.3	56.9
744	RM 1.4	*	*	*	*	*	*	76.8	77.2	74.4	74.7	71.9	68.7	64.6	63.7	62.6	56.9

*data not available due to lost/stolen devices

- As in previous years, substantial warming occurred between RM 38 and RM 21 (12.8°F in mid-August), as was observed from 1999 to 2004.
- A “moderating zone” extended from RM 18.0 downstream to RM 15.0 during the hottest part of the summer. Maximum stream temperatures, differed by only 0.3°F to 0.6°F from late July to early October.
- Between RM 10.8 and 10.2, where the Mad River flows into the Entiat River, stream temperatures below the confluence were slightly higher than at RM 10.8 from June to mid-August and then became slightly cooler in late August and early September. However, these essentially equivalent stream temperatures indicate that the Mad River does not have a great influence on Entiat River temperatures.

- Another “moderating/cooling zone” extended from RM 8.5 downstream to RM 5.3, where stream temperatures increased by only 0.2°F to 0.6°F from the mid-June to the mid-August and decreased by 0.2°F to 1.2°F from mid-August to October.
- From RM 5.3 to RM 1.4, stream temperatures gradually warmed (increasing by 0.8 °F to 4.0 °F), with the maximum stream temperature in the Entiat River recorded near the Keystone bridge (72.1°F).

Exceedences in the Mad River and Tributaries

Maximum water temperatures in excess of 61°F in the lower Mad River have occurred consistently since this stream has been monitored (1993-2005). Speculation has arisen about the Mad River zone of warming, its magnitude, extent, effects on fish, and natural temperature regime. To address these questions, an expanded network of continuous recording thermographs was deployed in the Mad River during the years 1997-present. Data from this expanded network have been used to construct a longitudinal summer thermal profile of the Mad River.

- The river originates at Mad Lake where stream temperatures are substantially warmer at the outlet of this high elevation (5900 feet) shallow lake;
- stream temperatures gradually cool going downstream until reaching the Cougar Creek area (3400 feet);
- re-warming progressively occurs from Cougar Creek downstream to Tillicum Creek (1400 feet);
- Tillicum Creek then provides a cooling influence evidenced by lower stream temperatures at the confluence with the Entiat River than those observed just above the Tillicum confluence.

Overall Conclusions

Based on all water temperature data compiled for the Mad River drainage, it appears that the thermal regime described again in this report is firmly established. Longitudinal profile data from the Entiat River indicate that the Entiat River has its own unique thermal regime. It is also concluded, based on several years of stream temperature monitoring results (1994-2005), that the present Wenatchee Forest Plan standards are simply not attainable in all Entiat/Mad waters in all years. Future iterations of Clean Water Act 303(d) listings, Watershed Analyses and Forest Plan revisions should take into consideration deviations from current water temperature standards that appear to be related to natural conditions within watersheds.

Specific Entiat District Recommendations

- Repeat the expanded longitudinal monitoring network in Mad River and major tributaries in 2006.
- Repeat the longitudinal monitoring network in the Entiat River (10 stations approximately 2 miles apart on the lower River) with the cooperation of private landowners, Chelan County Conservation District, Washington Department of Ecology and US Environmental Protection Agency (EPA) to provide on-loan monitoring devices in 2006.

- At three locations on the Entiat River (RM 1.4, RM 26 and RM 18) and one location on the Mad River (@ Tillicum Creek) monitor water temperatures over winter to further assess effects of water temperature on Chinook salmon eggs and to predict times to emergence of fry.
- Cooperate with USGS to install temperature monitoring devices at gage stations (Keystone, Ardenvoir).
- Use the triggered-start mode for Optic StowAway Temperature Loggers. The delayed-start mode used for some devices in 1998 resulted in immediate shutdown of some older devices.
- Continue to emphasize quality control of all temperature measuring devices prior to deployment to assure accurate results. More frequent field checks will be performed for timely detection of improperly functioning devices.
- Coordinate with other agencies (USFWS, Yakama Indian Nation, Washington Department of Ecology, USEPA) to exchange water temperature data and expand baseline temperature data base.

Wenatchee River District

The following information was obtained from the “2005 Temperature Monitoring, Wenatchee National Forest, Leavenworth and Lake Wenatchee Ranger Districts”, available from the Wenatchee River Ranger District. Summer stream temperatures were monitored at 18 sites during 2005 on the Wenatchee River Ranger District. Air temperatures were monitored at 5 of these sites. Streams listed under Section 303(D) of the Clean Water Act are denoted with **. Streams were chosen to reflect various amounts of management within watersheds (timber harvest, roads, etc.) and suspected natural temperature fluctuations.

Beaver Creek, North & South Forks
 Chiwawa River, 4 Sites
 Little Wenatchee River, 1 Site **
 Nason Creek, 1 Site**
 Phelps Creek, 2 sites
 White River, 1 Site
 White Pine Creek
 Chiwaukum Creek**
 Icicle River, 1 site**
 Mission Creek**
 Peshastin Creek below Ingalls Creek**
 Sand Creek
 Wenatchee River

Daily water temperatures were monitored in all streams. Monitoring occurred from mid June through October. Twelve of the monitoring sites exceeded daily maximum temperature standards at some point during the monitoring period, and Thirteen of the sites exceeded the seven-day average maximum temperature standards at some point during the period. It is believed that some of the temperatures are in error. Some of the data loggers were lost or vandalized.

Discussion

Twelve of the streams monitored exceeded daily maximum temperature standards at some point during the monitoring period. Of monitored streams, the following did not exceed the standard: Beaver Creek North Fork, Phelps Creek sites, and Whitepine Creek and Chiwaukum Creek

Thirteen of the streams monitored exceeded the maximum temperature 7-day average standard. On the Wenatchee River District, sites not exceeding this standard included Beaver Creek and Phelps Creek sites.

During the 2005 monitoring season, streamflows were the lowest for the period of record.

In general, the number of exceedences for all sites in 2005 were comparable to 2004, with most sites having only a slight increase in the number of exceedences. The exception was the South Fork of Beaver Creek, which had fewer exceedences in 2005. Also, the White River, Chiwaukum Creek, and Sand Creek had fewer exceedences for the daily maximum standard.

Wenatchee River District Recommendations

- Care should be taken to insure that loggers are placed to capture the representative temperature of the reach. To achieve this goal, effort should be expended to place loggers on the southerly side of the stream (for maximum shade benefit), well into the channel for maximum mixing and dewatering protection, and anchored to the bottom with lead weights.
- Beginning in 2004, longitudinal temperature profiles were discontinued under the assumption that there was sufficient longitudinal data to develop regression curves for those sites. These curves need to be developed.

Cle Elum District

The following information was taken from the “Cle Elum Ranger District, Water Temperature Monitoring, Water Year 2005” report available from the Cle Elum Ranger District. In the summer of 2005, fish and watershed personnel on the Cle Elum Ranger District placed temperature recorders in streams and rivers in the Upper Yakima, Taneum-Manastash, Swauk, Cle Elum and Teanaway drainages. Many streams on the District have historically been out of compliance with Chapter 173-201A WAC: Water Quality Standards for Surface Waters of the State of Washington and with the Northwest Forest Plan. Under the state guidelines, Class AA streams should not experience temperatures above 16°C (60.8°F) due to human activities. According to the Wenatchee National Forest Land and Resource Management Plan (1990), stream temperature should be less than 61°F on any given day, and the average 7-day maximum temperature should not exceed 58°F.

The temperature monitoring scheme includes long-term sites that will help detect trends over time, and sites designed to address specific management questions in each watershed. In the summer of 2005, the long-term sites were monitored sites. Additional recorders were placed above and below Lake Tucquala, to supplement stream survey data from August of 2005. Recorders were also placed along a gradient in Hudson Creek, where a commercial thinning project will take place.

Historical perspective

The Cle Elum RD has been monitoring temperatures across the district since 1996. In interpreting this year's data, it is helpful to consider how the summer of 2005 compared with previous summers. July was just slightly cooler than the past couple of years. August was warm, and September was cool in comparison with previous years. August stream base flow in the Teanaway River was lower than in

many of the past several years. The Teanaway River is the only unregulated river on the District for which there is continuous gage data. Higher streamflow is expected to buffer the stream against high temperatures, unless water reaching the stream warms up as it travels overland. In years with low baseflow that also have average to above-average summer air temperatures, it is expected to have warmer stream temperatures.

Of the twenty-two sites monitored, all but five exceeded a daily maximum of 61°F at least once during the recording period. Hudson Creek was the only creek that did not experience a 7-day average daily maximum greater than 58°F.

Within each watershed, temperatures showed a general pattern of being warmer in lower elevation, higher stream order locations. This pattern is consistent with accepted models of temperature gradients in river systems.

**Water temperature summary data for sampling locations
on the Cle Elum Ranger District in the summer of 2005**

SITE NAME	Installed	Retrieved	Maximum Daily Temperature (F)	# Days >61	7-Day Average Maximum Temperature (F)	# Days >58	# Days Sampled
SF Manastash at Buck Meadows Puncheon Bridge	5/31/2005	10/6/2005	61.92	5	60.18	26	126
SF Taneum	5/31/2005	10/6/2005	61.9	8	60.92	38	126
NF Taneum	5/31/2005	10/6/2005	63.97	28	62.74	58	126
Taneum Creek at Campground	5/31/2005	10/6/2005	68.2	59	66.87	78	126
Manastash below county bridge	5/31/2005	10/6/2005	72.81	74	71.23	84	126
NF Teanaway above Stafford	6/1/2005	10/6/2005	65.96	49	65.05	71	125
Middle Fork Teanaway	6/1/2005	10/4/2005	67.58	63	66.83	79	123
West Fork Teanaway							
Swauk at Mineral Springs	6/1/2005	10/4/2005	68.57	63	67.69	77	123
Cle Elum River at Deception Pass Trailhead	6/7/2005	10/5/2005	68.58	53	68.08	71	118
Cle Elum River at Scatter Creek	6/7/2005	10/5/2005	71.29	62	69.84	83	118
Cle Elum River Long Term Site	6/2/2005		Recorder was lost or stolen				
Cooper River above confluence with Cle Elum	6/7/2005	10/5/2005	72.09	77	71.36	93	118

SITE NAME	Installed	Retrieved	Maximum Daily Temperature (F)	# Days >61	7-Day Average Maximum Temperature (F)	# Days >58	# Days Sampled
Cooper River below Cooper Lake	6/2/2005	10/5/2005	71.58	81	71.07	99	123
Waptus River above confluence with Cle Elum River	6/2/2005	10/5/2005	68.89	60	68.10	78	123
Log Creek	6/2/2005	10/4/2005	Programming error--data not recorded			122	
Cabin Creek above cnf. w/ Log	6/2/2005	10/4/2005	61.97	11	61.24	41	122
Yakima River at Cabin Creek	5/26/2005	10/14/2005	71.05	68	70.58	88	139
Box Canyon Creek upstream from Kachess Campground	6/1/2005	10/4/2005	59.75	0	59.1	28	123
Gale Creek	6/1/2005	10/4/2005	59.69	0	59.2	27	123
Hudson Creek at forest edge, upstream of BPA corridor	8/4/2005	10/14/2005	63.93	15	62.78	21	69
Hudson Creek at upstream end of FS Road 4832	8/4/2005	10/14/2005	63.68	13	62.33	19	69
Hudson Soil Thermometer	8/4/2005	10/14/2005	Did not record				
Hudson #1 (483491)	7/12/2005	10/14/2005	55.91	0	55.39	0	92
Hudson # 2 (483490)	7/12/2005	10/14/2005	57.16	0	56.68	0	92
Hudson #3 (475282)	7/12/2005	10/14/2005	57.50	0	56.66	0	92

Upper Yakima Watershed

In the years following timber harvest activity in the Cabin Creek watershed, there has not been an observable pattern of system recovery. Temperature and flow in the mainstem Yakima River are almost entirely controlled by release from the three reservoirs in its headwaters. Each year, the majority of water stored in the Yakima basin is switched from the Upper Yakima watershed to the Lower in late August. This results in very elevated flow, then drastically reduced flow. The management scheme, called “flip-flop”, is designed to facilitate reproductive success for Chinook salmon by making sure that the cobble in which they choose to build their redds in late September will remain inundated with water throughout the winter. In years where there is significant thermal input in September, this reduction in flow might make the river susceptible to thermal extremes.

Water temperatures in Hudson Creek, particularly in the dispersed channel portion just below Interstate 5, appear to be controlled by groundwater. Slightly further downstream in the system, the stream responds more to thermal input.

Cle Elum Watershed

In the Cle Elum River system, Cooper and Tucquala Lakes collect and store heat energy. The Cooper and Cle Elum River have naturally-elevated stream temperatures as a result of this heat storage effect. Infrared photos of the Cle Elum River taken in 2001 revealed pockets of groundwater upwelling, and last year’s monitoring confirmed that these areas can provide thermal refugia throughout the summer season. In one such spot identified from the infrared, in the Cle Elum River just above the Cooper Bridge, continuous temperature data from 2003 showed that the area maintained temperatures between 50 and 53°F for the recording period. Groundwater influence in the river is very patchy, and the refuge habitat in these patches is most likely very important for salmonid success in the system. The District is currently working to redesign recreational access to the river so that these refuge areas are protected.

Teanaway Watershed

The North Fork Teanaway River is more likely to exceed its temperature limits in low water years. This is also true for the Middle and West Forks, but the number of days during which 61°F is exceeded is greater for these sites in all years, and the effect of baseflow is less easily seen. The North Fork Teanaway experienced maximum daily water temperatures in exceedance of 61°F on 49 days this summer, which is the greatest number since our monitoring began in 1996.

Baseflow is determined by the storage and movement of groundwater. While storage is primarily dependent upon snowpack from the previous winter, it is also influenced by riparian condition. In areas where soil is healthy and uncompacted, snow and rain will infiltrate and recharge the reservoir. In areas with compacted and nutrient-poor soils, water will tend to travel over ground directly into the stream.

Swauk Watershed

Swauk Creek travels along side Highway 97, with minimal riparian shading for most of its path, and there are little to no buffers from thermal input. The volume of flow in Swauk Creek is also quite low in mid- to late-summer, with a sizable percentage of the flow traveling subsurface. The creek experiences prolonged periods of high water temperatures in most summers.

Taneum/Manastash

In the draft Recovery Plan for the Middle Columbia population segment of federally threatened bull trout (*Salvelinus confluentus*), the recovery criteria include the establishment of bull trout in the Taneum watershed. Temperature appears to be a limiting factor in bull trout recovery, and in future monitoring years, we will focus on identifying the drivers of high stream temperatures in the mainstem Taneum.

There is not yet a large enough data set to draw conclusions about ecosystem recovery in the Buck Meadows area, but it will continue to be monitored to see the changes in water temperature that are likely to occur from the reestablishment of a functioning floodplain.

Cle Elum District Recommendations

- Long term data are crucial to understanding trends and drivers in water temperature. Continue to monitor long-term stations, and consider expanding that designation
- Continue monitoring Hudson Creek for potential changes resulting from commercial thinning and the I-90 expansion project.
- In the Cle Elum watershed, coordinate placement of thermometers with our assessment of dispersed recreation in the floodplain.

Stream Habitat Surveys

In 2005, stream habitat surveys were completed on 29 miles of stream. All surveys were conducted using the Region 6 Hankin-Reeves Level II Protocol (USFS Stream Survey Handbook, Pacific Northwest Region 6, 2005). The results of the surveys are not yet available but the data have been entered into the forest database. Streams were usually snorkel surveyed to determine fish distribution.

K. 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.

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

The Forest currently has 18 active allotments. This is a decline of 5 active allotments in the last few years. The decline of active allotments is related primarily to the decline of timber harvest and the associated grazing of forested rangeland and permittee retirements. There are 16 inactive allotments that will need to be closed 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 grazing that is currently taking place on the Wenatchee National Forest is associated with permitted sheep operations. Of the 18 active allotments, 8 allotments authorize cow/calf pairs and 10 allotments authorize sheep operations.

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 indicates 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 personnel continually work with the permittees to administer the allotments according to the Forest Plan Standards and Guidelines, as well as the Northwest Forest Plan Standards and Guidelines. These standards and guidelines are incorporated into the grazing permits and discussed during annual operating instruction meetings, Allotment Management Plan development, and allotment field inspections. This is a significant change in the way range administration personnel and permittees view grazing practices as compared to ten years ago when the Forest Plan was first implemented.

The increased focus on administration of the range resource in view of meeting the Forest Plan standards and guidelines has resulted in improved range health. On many allotments this is quite evident. Range management specialists are observing improvements in plant vigor, plant residual after the grazing period, desirable plant composition, and improvements to riparian areas. Due to funding levels, a majority of the utilization studies were ocular estimates

Precipitation patterns and temperatures have greatly influenced the forage production which greatly influences utilization, livestock distribution and patterns of use within the allotments. Over the past five years, forage production on the Forest has been quite variable due to drought conditions from 2002-2005. During these conditions, there was an increase in non-use of range allotments by grazing permittees due to lower forage production and limited water availability. Permittees were required to remove livestock early in the grazing season in some cases.

During the past five years, 25 condition and trend monitoring areas have been resampled on the Wenatchee National Forest. Many of these monitoring areas were originally established in the 1950's and 60's. Results indicate that rangeland condition and trends are improving on the Forest. The Forest also recognizes that there are rangeland and riparian areas which 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 have indicated that elk grazing is increasing on the Cle Elum and Naches Ranger Districts. Monitoring transects indicate that 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.

A NEPA decision was completed for the Eagle-Blagg, Switchback, Limekiln, and Mosquito Ridge Allotments. The 2001 grazing season implemented the updated grazing strategies and it was found that for the most part, the current grazing plan is working well. There are a few livestock watering locations that will need hardening. The decision closed approximately 1500 acres to sheep grazing to protect

sensitive plants and bighorn sheep habitat. The decision also required relocation of 10 bedding grounds, armoring some streamside watering areas, and treating some areas for noxious weeds infestations. Part of the decision was to develop a bighorn-monitoring plan with the Washington Department of Fish and Wildlife (WDFW) which has now been ongoing for several years.

In 2001, NEPA analysis was initiated on the Manastash Allotment cluster (Nile, Naches, Rattlesnake, and Manastash) to update Allotment Management Plans. A decision was reached in 2004 and has been implemented. This project updates grazing strategies and coordinates them with current resource concerns. With the completion of this cluster of allotments, most of the active sheep allotments on the Wenatchee National Forest will have been updated to meet current resource concerns. Analysis of the Swauk and Rainy-Jove sheep allotments is planned within the next few years.

Range analysis on the Tieton, Soup Creek and Conrad Meadows cattle allotments situated on the south end of the Forest has been ongoing for the last two years. A decision is expected in early 2007 on these three allotments.

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.

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

L. ROAD MANAGEMENT

Monitoring Item

Road Maintenance

The goal is to ensure that the transportation system is being managed and maintained to the appropriate standard to serve the planned resource management objectives.

The Wenatchee National Forest continues to experience the effects of the loss of maintenance performed and/or paid for by timber purchasers, and the reduction in maintenance dollars. In the past, the timber sale program has accounted for approximately 1 to 1.5 million dollars of maintenance annually. If appropriated road maintenance funds are not increased, there could be a significant reduction in the amount of roads available to the public as well as a reduction in the level of comfort and ease of access. This year, only 36% of the roads received some level of maintenance, which resulted in 57% of the roads not being maintained to full road management objectives.

The Wenatchee National Forest is continuing a comprehensive process of Access and Travel Management, and this year will continue a Roads Analysis process that is likely to identify additional roads to close or obliterate/decommission.

Maintenance Level	Number of System Miles	Miles Receiving Maintenance	Mile meeting Road Maintenance Objective (RMO)
Level 1 (Closed/in storage)	1922	168	1076
Level 2 (High Clearance)	2873	1106	863
Level 3 (Passenger Car – single lane, gravel)	807	636	459
Level 4 (Pass. Car – single lane, improved)	120	107	72
Level 5 (Pass. Car – Double lane, paved)	58	38	28
Total Objective Miles	5780	2055 = 36%	2498 = 43%

Recommendations

Continue monitoring as scheduled.

Continue Roads Analysis as outlined in the new Road Management Policy to determine the appropriate size and makeup of our existing road transportation system.

Reduce maintenance levels and decommission (remove from the system) those roads determined to be no longer necessary.

M. 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 57 starts, somewhat below the 5-year average of 96 fires. The 1,212 acres burned was well below the 36,947 acre average for the last 5 years. Lightning accounted for less than 25% of the fire starts (14) and human caused starts for the remaining 43 fires. Wenatchee National Forest employees supported fire suppression efforts in Region 6 as well as other regions in the National Forest System. Additionally, Forest personnel supported hurricane relief efforts throughout the year.

The first statistical fire of the season occurred on May 23, 2005. The one large fire on the Forest, was the 1,150 acre Dirty Face Fire, located on the Wenatchee River Ranger District. It started on July 30, 2005 and was the only fire requiring an Incident Management Team (IMT).

Cause	2005		5-Yr. AVG	
	No. of Fires	Acres	No. of Fires	Acres
Lightning	14	4.8	44.6	24,418.0
Equipment	5	4.1	2.6	3,286.0
Smoking	2	0.2	3.2	0.5
Campfire	17	3.8	25.6	8,961.0
Debris Burn	1	1.0	1.8	5.6
Incendiary	2	2.6	3.6	32.5
Children	1	0.1	0.2	0.0
Misc.	15	1,195.5	14.8	242.8
Totals	57	1212.1	96.4	36946.4

Continued emphasis was placed on interagency programs that enhance 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 IMT's in partnership with the State of Washington Department of Natural Resources and other federal agencies. The Forest provided support to other IMT's for incidents outside the forest located on interagency partners lands.

Recommendations:

Results are well within the historical averages for fire starts. The Forest does have a greater need for qualified Fire Investigators to determine the cause of fires other than those caused by lightning.

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 question is:

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

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 2005, 8,482 acres were treated by prescribed fire.

The Forest successfully implemented prescribed burns that met resource management objectives and reduced fuel loadings. Today's increased awareness about fuel loadings and stand densities in excess of historic conditions, in the Wildland Urban Interface (WUI), has led the Forest to prioritize where these treatments are occurring. The Forest is looking for ways to increase the use of prescribe 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 is still available within designated wilderness areas. Every fire start in a wilderness area is evaluated as to its suitability or not. There were no wilderness fires suitable for Wildland Fire Use in 2005

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 wilderness areas for suitability for Fire Use. Encourage the development of Fire Use Modules on the Forest, and develop the analytical skills needed for long term risk assessments.

N. AIR RESOURCE MANAGEMENT

Monitoring Item-

Long-term Trends in Air Quality

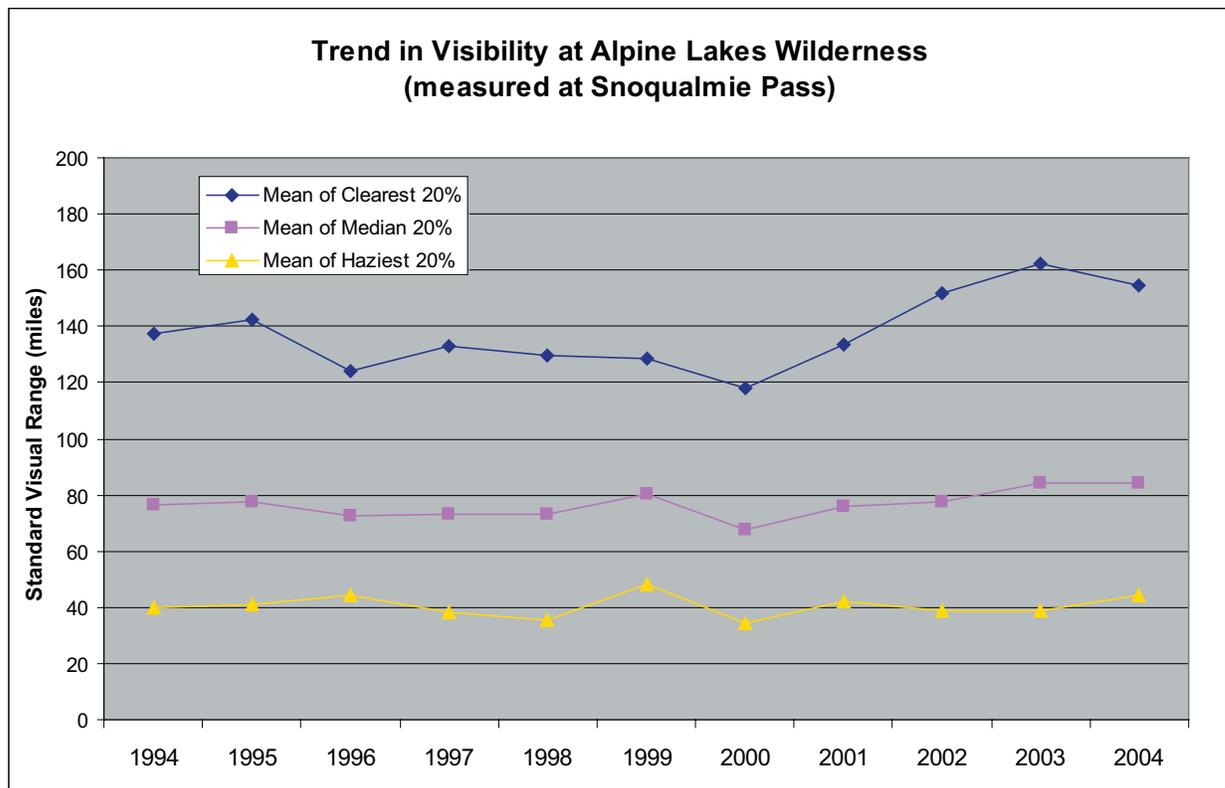
The goal is to evaluate the long-term air quality of Class I Areas. These areas are wilderness areas formally designated by the Clean Air Act as Class I air quality areas. There are five such areas within the State of Washington: Glacier Peak, Goat Rocks, Mt. Adams, Pasayten and Alpine Lakes. Instruments located within the Wenatchee National Forest have monitored the Alpine Lakes since 1994. The chart shows trends in visibility for the Alpine Lakes Wilderness Area. Unit of measure is miles of visual range.

The goal is to maintain air quality in conjunction with all cooperating agencies. The monitoring questions:

Is the Forest in compliance with direction outlined in the Clean Air Act, the Washington State Implementation Plan, and National Forest Policy?

Is visibility in Class I wilderness areas maintained at a high quality level?

Trends are plotted showing the visible range for three groups of days for each year of record: the cleanest, the haziest and the median 20%. Alpine Lakes Wilderness has the longest period of record and shows an increase in visible range for the 20% of cleanest days over the past 5 years. Data for 2005 is not yet available.



Recommendations

The instruments will be operated this year as part of the national network of Class I visibility monitoring sites. Data from these sites will continue to be used as the Forest Service evaluates any new permits for emission sources that could potentially affect these areas.

Monitoring Item-

Long-term Trends In Air Quality

The goal is to evaluate the long-term air quality of major air sheds within the Wenatchee national Forest where smoke can accumulate due to air stagnation. The monitoring questions are:

Do fuel management prescribed burns on the Wenatchee National Forest contribute significantly to smoke levels in major airsheds of the forest area?

Are windows of opportunity to complete prescribed burns being fully utilized so as to disperse smoke and avoid accumulation of smoke in populated valleys adjacent to the forest?

The effort since initiation of sampling at five sites within the Wenatchee National Forest in the fall of 2002, has been to train operators and establish a data record that meets quality control standards of the DOE and EPA. That objective has been accomplished. Now the process used by the State Department of Natural Resources to review and authorize requested prescribed projects on the Forest can utilize local air quality data in the review process. The intent is to avoid air stagnation periods or periods when there are high levels of background smoke, while utilizing periods of high air quality to accomplish prescribed burning.

Smoke monitors are operated on a yearlong basis at three locations: Chelan, Leavenworth and Wenatchee. These sites are operated by the Wenatchee National Forests in cooperation with the State of Washington Department of Ecology, and are part of a statewide network of air quality instruments. Data from these sites are posted hourly on the DOE web-site and can be accessed at: <http://airr.ecy.wa.gov/Site/reports/report.html>.

Recommendations

Instruments will be operated on a yearlong basis to document the air quality impacts of all smoke sources, winter residential wood burning, spring and fall prescribed fires, and summer wildfires. Efforts are ongoing to evaluate data and make comparisons to air quality standards.

IV. FOREST PLANNING UPDATE

There was one forest-wide amendment to the Wenatchee Forest Plan in 2005. The Record of Decision 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.

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	T22N, R11E Sec 16	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	T28N, R 21E Sec 20 & 21	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	T25N, R.17E. Sec. 27 & 35	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	T24N, R17E Section 27	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	T24-25N, R17E Multiple Sections	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	T24N, R16-17E Multiple Sections	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	T26-27N, R19E Section 16	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	T25N, R20E Multiple Sections	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	T24-25N, R19-20E Multiple Sections	Authorization of grazing on a temporary pasture outside an existing livestock allotment.
Amendment 14	02/97	T27N, R.18-19E Multiple Sections	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	T22N, R19E Section 22	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	T21N, R13E Section 12 T22N, R11E Section 36 T19N, R13E Section 8	Site-specific amendment to allow for wetland crossings by access road segments to private inholdings where no other options exist.
Amendment 20	09/99	T27N, R17E Section 22	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	T18-20N, R12-15E Multiple sections	Forest Plan amendment to assign allocations to lands acquired from Plum Creek Timber Company as part of the legislated I-90 Land Exchange.

AMENDMENT	DATE	LOCATION	DESCRIPTION
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 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.

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