

United States
Department of
Agriculture

Forest
Service

Pacific
Northwest
Region

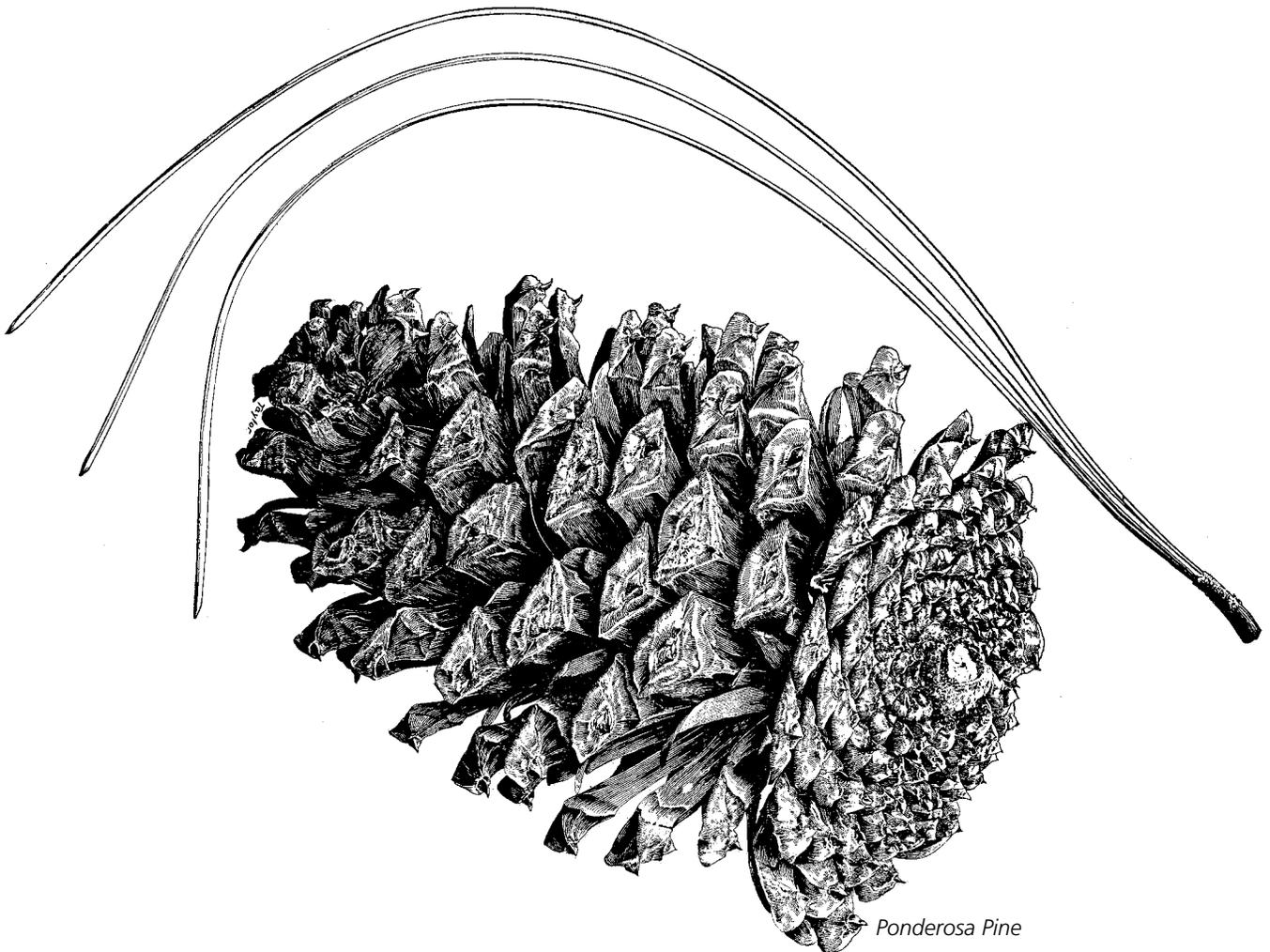
2003



Monitoring Report

for the Land and Resource Management Plan

Wenatchee National Forest Fiscal Year 2001



July 2003

Dear Forest User,

The *Wenatchee Forest Plan* establishes general direction of all resource management activities on the Forest. It provides for forest protection and coordinated multiple-use management of outdoor recreation, range, timber, watershed, wildlife and fish, minerals, and wilderness. The overall purpose is protection of ecosystem resources and providing for the sustained production of goods and services for the benefit of the American people.

Monitoring is a key part of *Forest Plan* implementation. This report summarizes and highlights Forest Service monitoring activities for Fiscal Year 2001 (October 1, 2000 through September 30, 2001). This is our tenth Forest Plan Monitoring Report and it includes a summary of what has been learned from the last five years of monitoring in each resource area.

As Okanogan and Wenatchee National Forests Supervisor, I am responsible for ensuring that all Forest management activities comply with the *Forest Plan* Standards and Guidelines and Management Area Prescriptions. The monitoring and evaluation program tells us how we are doing in implementing the promises made in the *Forest Plan*. To keep you informed, I have prepared the annual Monitoring Report describing progress made in implementing the *Forest Plan* as reflected by monitoring and evaluation. This year's report is quite late because of the significant impacts of the fires seasons of 2000 and 2001.

The Wenatchee Forest Plan has been amended 22 times since its implementation in 1990 through the end of September 30, 2000. These amendments have kept the *Forest Plan* current and responsive to the changing needs of the American people. The *Plan* was substantially amended by the *Northwest Forest Plan* on April 13, 1994. Whenever the term "*Plan*" or "*Forest Plan*" is used in the Report, it refers to the *Wenatchee Forest Plan* and all amendments.

This year, the Monitoring Report can be accessed through the Internet on the Wenatchee National Forest's home page at www.fs.fed.us/r6/wenatchee. If you do not have access to the Internet and would like to receive a hard copy of the Monitoring Report, please call or write to the Okanogan and Wenatchee National Forests Headquarters and request a copy of the Wenatchee National Forest FY 2001 Forest Plan Monitoring Report.

Okanogan and Wenatchee National Forest
215 Melody Lane
Wenatchee, WA 98826
(509) 662-4335

If you have any questions, concerns or comments regarding the information in this report, please contact Susan Carter Craig, Ecosystem Coordinator, Wenatchee National Forest at (509) 662-4335.

I hope you will continue to be involved with the management of National Forests.

Sincerely,

Darrel Kenops
Forest Supervisor

Contents

I. INTRODUCTION.....	1
PURPOSE OF THE MONITORING REPORT	1
GENERAL INFORMATION	1
II. SUMMARY OF THE RECOMMENDED ACTIONS	2
SUMMARY TABLE	4-7
III. INDIVIDUAL MONITORING ITEMS.....	8
A. RECREATION	8
B. WILD, SCENIC, AND RECREATIONAL RIVERS.....	11
C. SCENERY MANAGEMENT	12
D. WILDERNESS.....	14
E. CULTURAL RESOURCES.....	15
F. COORDINATION OF FOREST PROGRAMS WITH INDIAN TRIBES.....	16
G. SENSITIVE PLANTS, BIODIVERSITY, AND OLD GROWTH	18
H. WILDLIFE.....	22
I. TIMBER OFFERED, HARVESTED, AND RELATED SILVICULTURAL ACTIVITIES	38
J. SOIL, WATER, FISHERIES AND RELATED WATERSHED MANAGEMENT	46
K. RANGE MANAGEMENT AND RELATED ACTIVITIES	75
L. ROAD MANAGEMENT	77
M. INSECT AND DISEASE.....	79
N. FOREST FIRE PROTECTION	80
O. AIR RESOURCE MANAGEMENT (not evaluated this year)	83
P. MINERALS.....	83
Q. COMMUNITY EFFECTS AND RESOURCE BUDGETS	85
R. GENERAL MONITORING OF STANDARDS AND GUIDELINES	91
S. LANDS.....	92
IV. FOREST PLAN UPDATE	93
LIST OF PREPARERS.....	95

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 amended in 1994 by the *Record of Decision and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (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 philosophies that serve as the basis for all Forest Service management on the 2.2 million acre Wenatchee National Forest.

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* Goals and 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 the 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.



Douglas Fir

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 are needed to evaluate the results (continue to monitor). For some items, several years of data collection are 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 exceeded 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. The Forest Supervisor can make non-significant amendments; significant amendments require Regional Forester approval.

Summary of Recommendations Table For FY 2001

	Results OK; Continue Monitoring	Change Management Practices	Further Evaluation	Forest Plan Amendment or Revision	Recommendations
A. RECREATION					
Forest Trails	■				Continue monitoring as scheduled
Management of Developed Recreation	■				Continue monitoring as scheduled
Management of Dispersed Recreation Areas	■				Continue monitoring as scheduled
B. WILD and SCENIC RIVERS					
Wild, Scenic and Recreational Rivers	■				Continue monitoring as scheduled
C. SCENERY MANAGEMENT					Continue monitoring as scheduled
Scenic Resource Objectives	■				Continue monitoring as scheduled
Stand Character Goals	■				Continue monitoring as scheduled
D. WILDERNESS					
Recreation Impacts on Wilderness Resources					Continue monitoring as scheduled
E. CULTURAL RESOURCES					
Cultural and Historic Site Protection	■				Continue monitoring as scheduled
Cultural and Historic Site Rehabilitation	■				Continue monitoring as scheduled
F. COOPERATION OF FOREST PROGRAMS WITH INDIAN TRIBES					
American Indians and their Culture	■				Continue monitoring as scheduled
Coordination and Communication of Forest Programs with Indian Tribes	■				Continue monitoring as scheduled
G. SENSITIVE PLANTS, BIODIVERSITY AND OLD GROWTH					
Maintenance of Sensitive Plant Populations	■	■			Continue to address and evaluate the effects of proposed actions on sensitive plants. Establish quantitative formal monitoring as needed to protect sensitive plants and to ascertain the effects of natural and management activities on these species.
Biodiversity and Old Growth	■				Become more quantitative in evaluation of weed populations and continue to seek ways to prevent noxious weed infestations.
Survey and Manage		■	■		Continue to address biodiversity in NEPA documents and Watershed Assessments. Integrate assessments of Survey and Manage Species into activities as directed by the NWFP. Continue to increase use of native plants for restoration and rehabilitation and monitor fire effects as needed.
Old Growth Ecosystems	■				Continue to follow oil growth acres harvested and address the issue in NEPA documents where applicable.

	Results OK; Continue Monitoring	Change Management Practices	Further Evaluation	Forest Plan Amendment or Revision	Recommendations
H. WILDLIFE					
Management of Indicator Species Habitat	See Coments			■	Recommend dropping this item. The original Forest Plan allocations of OG1 and OG2 were designations for pileated woodpeckers, marten and northern three-toed woodpeckers. The NWFP changed these designations and this monitoring item is no longer applicable.
Primary Cavity Excavators	■				Re-sample within the five years and salvage logging study area during 2004 and 2005 to monitor snag attrition and the response of primary cavity excavators.
Land Birds	■				Complete post-prescribed fire monitoring of land birds in the Pendleton Monitoring Study and FFS Study and integrate results into future restoration projects.
Riparian Dependent Wildlife Species	■		■		Use data from the riparian amphibian monitoring as a pilot study to determine the statistical power of determining trends in amphibian populations under the current study design. Integrate the results of the riparian bird study into Forest Plan monitoring once they are available.
Deer, Elk and Mountain Goat Habitat			■	■	Coordinate with the WDFW to obtain population monitoring data; complete the interagency assessment of elk habitat capability; collaborate with the WDFW on the Chelan County Mule Deer Study; revise and refine the elk and deer habitat effectiveness model
Northern Spotted Owl	■				Monitoring should include tracking the changes in the availability of suitable spotted owl habitat over time. Continue to monitor >50% of the known spotted owl sites to track young/site over time.
Bald Eagle	■				Continue to monitor nests and document the number of young produced
Peregrine Falcon	■				Continue to monitor potential and active nest sites.
Grizzly Bear	■			■	Continue to update core area GIS layers; implement the Sanitation Policy; continue to report and follow up on grizzly bear observations.
Gray Wolf	■				Track road densities in GIS to monitor habitat effectiveness; cooperate on development of a recovery plan for the North Cascades,;
Marbled Murrelet	■				Continue to monitor projects within the range of the species
Canada Lynx	■				Continue to monitor projects within the range of the species
Survey and Manage Species	■				Continue surveys of projects for Survey and Manage mollusk species

	Results OK; Continue Monitoring	Change Management Practices	Further Evaluation	Forest Plan Amendment or Revision	Recommendations
I. TIMBER OFFERED, HARVESTED, and RELATED SILVICULTURAL ACTIVITIES					
Timber Offered (ASQ) and Timber Sale Program Quantity (TSPQ)	■			■	Continue to sell timber as directed in the Forest Plan and NWFP. Continue to monitor PSQ utilizing the STARS and PSS databases.
Timber Harvest Units (size, shape, location)	■				Continue monitoring as scheduled.
Timber Harvest	■				Continue monitoring as scheduled.
Silvicultural Practices	■				Continue monitoring as scheduled.
Reforestation	■				Utilize 1-1 bare root or plug-1 stock with large roots to help increase survivability. Continue monitoring.
Lands not Suitable for Timber Management	■				Continue to update the GIS layer and monitor the reforestation success on all lands that are harvested or deforested by wildfire, especially in the drier, low elevation sites.
J. SOIL, WATER, FISHERIES and RELATED WATERSHED MANAGEMENT					
Maintenance of Long-Term Soil Productivity	■	■	■		Continue to monitor soil rehabilitation techniques
Long-term Trends in Watershed Condition	■		■		Continue to monitor. Develop stage-discharge relationships so water level can be equated to stream flow volumes.
Fish Management Indicator Species (MIS) Populations	■		■		Continue monitoring.
Aquatic Habitat Objectives	■		■		Continue surveys and data analysis for use in Forest Plan revision.
Aquatic Ecosystems	■		■		Continue surveys and data analysis for use in Forest Plan revision.
K. RANGE MANAGEMENT AND RELATED ACTIVITIES					
Forage Utilization	■				Continue to implement utilization monitoring on active grazing allotments; develop a monitoring agreement with WDFW on bighorn sheep. Develop a plan to resolve livestock/wildlife concerns on the Cle Elum and Naches Ranger Districts; adjust grazing strategies to reduce grazing effects on other resources; continue to update range analysis surveys for NEPA decisions and allotment management plan updates.
L. ROAD MANAGEMENT					
Road Construction / Reconstruction	■			■	Continue monitoring. Monitoring indicates that management objectives of the original Forest Plan are not being achieved. Revise estimates during Forest Plan revision.
Roads Maintenance			■		Continue monitoring. Continue Roads Analysis to determine appropriate size and makeup of the existing road system. Reduce maintenance levels and decommission those roads no longer necessary.
Roads Closed or Obliterated	■		■		Further evaluation; yearly information is needed since the future is uncertain, it would be premature to make assumptions for the purposes of estimating outputs.

	Results OK; Continue Monitoring	Change Management Practices	Further Evaluation	Forest Plan Amendment or Revision	Recommendations
M. INSECT and DISEASE					
Insect and Disease Control	■				Continue monitoring; incorporating options for achieving management objectives identified in the Dry Site Strategy.
N. FOREST FIRE PROTECTION					
Forest Fire Protection	■				Continue to monitor the effectiveness of the fire protection and prevention programs.
Use of Prescribed Fire	■				Continue to support on-going research supporting fire as an important disturbance process in all dry site ecosystems. Manage wildland fire within designated wildernesses for resource benefit.
O. AIR RESOURCE MANAGEMENT					Monitoring item not evaluated this year.
P. MINERALS					
Mine Site Reclamation	■				Continue monitoring.
Mine Operating Plans	■				Continue monitoring.
Q. COMMUNITY EFFECTS					
Community Effects	See Comments ■				<u>Recommend dropping</u> two monitoring questions for this section; "Are payments to counties changing?" and "Are local employment patterns changing?" since payments to counties have changed under PL 106-363 and are no longer related to Forest outputs.
Resource Budgets	See Comments				<u>Recommend dropping</u> this item. Since 2000, the Okanogan and Wenatchee National Forests combined budgets. Expenditure records are now kept only for the combined forests and a comparison to previous budgets is now meaningless.
R. GENERAL MONITORING of STANDARDS and GUIDELINES	■				Continue monitoring as scheduled at the watershed scale. Support the regional interagency effort in developing effectiveness monitoring protocols to determine the answer to: Are implemented Standards and Guidelines achieving the expected results?
S. LANDS	■				Reported for informational purposes only.

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 monitoring question is:

Are Forest management activities resulting in changes in ROS settings; and, do end results meet the experience levels expected in the *Forest Plan*?

The activities that have the potential to affect the ROS setting on the Forest are those activities that change the development level through roads or development of additional facilities. The Forest recreation program has been focused on reconstruction and rehabilitation of existing facilities. This maintains the current ROS class rather than changing it.

Other activities that have the potential to change the ROS class are road building in unroaded areas for projects such as powerline corridor development, mineral exploration and development, fire suppression activities and timber sales. During the past year there were no known changes caused by any of these activities.

Recommendations

Continue monitoring as scheduled.

Fiscal Year 2000 Recommendations

Last year's recommendation was to continue monitoring as scheduled; this was completed.

Monitoring Item-

FOREST TRAILS

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

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

Are trails with mixed users (e.g. horse/hiker, hiker/ORV) meeting the expectations for all intended users?

The trails of the Wenatchee National Forest are providing the variety of opportunities as intended in the *Forest Plan*.

The Forest surveyed visitor use in FY2001 under the National Visitor Use Monitoring project. This statistically valid survey of recreation use was the first known visitor survey of all recreation use on the Wenatchee National Forest. The survey period was from October 15, 2000 through October 14, 2001. The summer of 2001 was a very active fire season on the Wenatchee National Forest with some areas closed to public entry on the Leavenworth and Chelan Ranger Districts. Total visits for the Forest were 2,532,617. 34.2 percent of these were for trail related recreation opportunities.

The following table gives the trail use by activity from the visitor survey. The first column gives the percent participation by visitors in that activity during their visit to the Wenatchee National Forest. The percent primary participation is their reason for visiting the Forest. For example, 44.3 percent of all visitors participated in hiking or walking in the Forest. For 4.0 percent of the visitors, hiking/walking was their primary reason for coming to the Forest. This means that almost half the visitors coming to the Forest went hiking or walking even though it was not their primary reason for coming.

Trail Activity	Percent of visitors participating in activity	Percent of visitor's stated primary activity
Backpacking	17.4	16.7
OHV's	2.1	1.3
Snowmobiles	4.3	4.2
Hiking/Walking	44.3	4.0
Horseback	2.0	.8
Bicycling	2.3	.6
X-Country Skiing/Snowshoe	7.7	6.6

Backpacking is included as a trail activity since hiking is an integral part of the experience. The winter trail use is 10.8 percent, while the summer trail use is 23.4 percent. The snowmobile program is managed as a trail program, but, the trail system overlays the summer road system. Most of the snowmobile use occurs on the summer road system, except for some snowmobile use that is in "play areas" and off-trail travel corridors.

The complete report can be accessed at the following web site:

www.fs.fed.us/recreation/programs/nvum/

The *Wenatchee Visitor Use Monitoring Report* as well as reports for other national forests are available there.

Trail conflicts between users remain at fairly low levels. The visitor surveys conducted in 2001 did not receive any comments regarding trail conflicts between users. Very few comments have been received or noted by field rangers.

Over the past five years, trail recreational trail use has become fairly controversial because of potential effects on wildlife species. Examples are hiker impacts to grizzly bears, snowmobile impacts on lynx habitat, and cross-country skier impacts on deer and elk winter range. As part of the Goose-Maverick lawsuit, the Forest has undertaken a study of trail recreation on wildlife habitats. The complete report, *Assessing the Cumulative effects of Linear Recreation Routes on Wildlife Habitats on the Okanogan and Wenatchee National Forests*, prepared by William Gaines, Peter Singleton and Roger Ross, is available on the Wenatchee National Forest website:

www.fs.fed.us/r6/wenatchee/recreate/rec-wildlife-effects-3-20-03.pdf

In addition, the Forest is initiating another study to look at the distribution and timing of recreation use across the entire forest. This study is using the National Visitor Use Monitoring data to model recreation use. Additional information on this study is available at:

www.fs.fed.us/r6/wenatchee/recreate/rec-use-model.pdf

Recommendations

Continue monitoring as scheduled.

Fiscal Year 2000 Recommendations

Last year's recommendation was to continue monitoring as scheduled; this was completed.

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?

Visitor use at developed recreation sites continues at high levels. Most sites were at, or close to, capacity on most summer weekends. There are campground sites available during midweek, and early and late season. The Forest is currently meeting public demand for developed recreation facilities.

The Capital Investment Program (CIP) for new construction, or reconstruction of existing recreation facilities such as campgrounds and trails, continues to decline. However, the campground concessionaire program has reduced maintenance costs, since the concessionaire now performs routine maintenance. Campgrounds that did not generate sufficient revenue to interest concessionaires have now been placed under the Recreation Fee Demo program. This program has provided supplemental funds to ranger districts for these higher maintenance cost campgrounds.

The *National Visitor Use Monitoring Report* showed that 17.8 percent of visitors used developed campgrounds, while the number of visitors who said that staying in a developed campground was their primary activity was at 10.9 percent. Forest Service campgrounds are used as a base for other recreational activities as well as being the primary focus of a National Forest visit.

Recommendations

Continue monitoring as scheduled.

Fiscal Year 2000 Recommendations

Last year's recommendation was to continue monitoring as scheduled; this was completed.

Monitoring Item-

MANAGEMENT OF DISPERSED RECREATION AREAS

The goal is to provide opportunities for dispersed recreation activities where compatible with other resource management objectives. The monitoring questions are:

Are dispersed sites meeting public demand?

Is the Recreation Opportunity Spectrum providing the expected variety for Forest users?

Dispersed camping is defined as camping in sites outside of developed campgrounds that are accessible by vehicle. The visitor use survey showed that 5.9 percent of visitors participated in dispersed camping, while for 3.0 percent of visitors, it was the primary purpose for visiting the Wenatchee National Forest. These numbers are about one-third of the use in developed campgrounds.

The highest demand is for camping spots adjacent to streams and lakes that are accessible by roads. This increase in both camping and trail use in riparian areas is a concern. In several areas, the Wenatchee National Forest has controlled vehicle access, provided toilets, and provided parking to minimize the impacts of recreation use on the riparian resource. These projects have been very successful where the sites were designed using an interdisciplinary team composed of fisheries biologists, recreation planners, engineers, archeologists and landscape architects. These sites have met the needs of recreational users while protecting the riparian resources.

The Forest conducted a review of dispersed recreation on the Cle Elum and Naches Ranger Districts. The major finding was the need to provide additional sanitation facilities in areas that have heavy recreational use. The Fee Demo program was used to address this problem. The Lake Cle Elum area was put under the Northwest Forest Pass program and the resulting funds used to rent toilets that are placed around the lake during the use season. This prevented a large amount of human sewage from entering a public drinking water supply. Similar programs were developed on other ranger districts to address sanitation issues.

Dispersed recreation use continues to increase, but it appears that public demand is being met. The Recreation Opportunity Spectrum continues to provide the expected variety for Forest users.

Recommendations

Continue monitoring as scheduled.

Fiscal Year 2000 Recommendations

Last year's recommendation was to continue monitoring as scheduled; this was completed.

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 Wenatchee National Forest that had the potential to affect the classification determined in the *Forest Plan* for recommended rivers.

Recommendations

Continue monitoring as scheduled.

Fiscal Year 2000 Recommendations

Last year's recommendation was to continue monitoring as scheduled; this was completed.

C. SCENERY MANAGEMENT

Monitoring Item -

SCENIC RESOURCE OBJECTIVES

The objective is to manage vegetation and facilities in a manner 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?

Promoting high scenic quality of the forest environment, reducing sign clutter, and providing information and use opportunities in the natural and cultural landscapes are important goals to the Forest visitors. These goals are achieved by promoting a more natural appearing vegetative pattern through variations in tree density, species composition, irregular spatial arrangement of trees, and emphasis on the existing large tree characteristics of the areas

Wenatchee National Forest landscape architects reviewed projects on ranger districts to assess the potential cumulative effects of resource activities on scenery.

Three major viewsheds: Blewett Pass Highway 97, White Pass Highway 12, and Shady Pass have been monitored continuously in past years and were again reviewed. Scenic resources on these viewsheds vary from a natural appearance to an altered condition. However, since there were no major projects in these corridors in the last year, other project areas were monitored as well. Monitoring will continue on these viewsheds as future projects develop.

Mud Creek Riparian Road Relocation Project

This year, the Mud Creek Riparian Road Relocation project on the Entiat Ranger District was monitored. Overall, the project met the desired scenic quality and lies lightly on the landscape by taking advantage of topography. The new travel route provides access away from the riparian zone, and its near ridgetop location increases views of distant landscapes. Sinuous road alignment on the landscape, earth cuts and fills, and artful design at the intersection of the main Baldy Mountain travel route provide a natural appearance and blends the new road with the landscape character of the area. Other sections of the road relocation and rehabilitation project included closure of a spur road. The use of earth mounds, rocks, and woody debris to close the old road was functionally successful, but not aesthetically integrated into the landscape character of the existing roadside. Future design should artfully design road closures with dirt, boulders, and vegetation to screen old roads from view.

Projects Monitored in Other Viewsheds

Other projects monitored were the new bridge installations on Chatter Creek and White River on the Leavenworth and Lake Wenatchee Ranger District that were installed to replace old and unsafe existing bridges. The rustic earth colored bridge structure blends well with the forest setting and is architecturally compatible with the form, line, color and texture of the landscape character of their respective places of high scenic quality.

A snow groomer storage structure at the Chiwawa Snow park area on the Lake Wenatchee Ranger District was also monitored. The structure was screened from public view both to maintain the character of the setting and provide some security for the building

Scenic Areas of The 1994 Fire Restoration Projects

Two areas were monitored this year: Tumwater Mountain and Boundary Butte on the Leavenworth Ranger District.

These areas continue to show slow recovery from the 1994 fires. The Boundary Butte landscape character is changing from a severely burned landscape of brown and gray colored snags to one with mostly gray and silver snags that are now falling at a greater rate. The foreground and middleground views still appear to be severely altered due to the lack of trees. In contrast, the mosaic pattern of the burn in the Tumwater Mountain area provides a variety of small openings, patches of silver snags, and green up of the newly emerging forest intertwined with the existing forest. The landscape scenic setting provides a diverse mix of form, line, color and texture that reflect the inherent landscape character of the Cascade Mountain Range.

Recommendations

Continue working with the Department of Transportation, White Pass Ski Area and other permittees to ensure signs and structures are esthetically designed, minimize the number of structures and signs and ensure that maintenance and repair projects maintain a high degree of esthetic integration

Continue to monitor to maintain and enhance high scenic quality along the travel routes by retaining natural appearing scenery and carefully designed fuel reduction projects.

Continue to monitor as scheduled projects in special places and areas of high scenic concern

Continue to monitor scenic areas of the 1994 fire restoration projects as scheduled.

Fiscal Year 2000 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

Monitoring Item –

STAND CHARACTER GOALS

The objective is to manage vegetation so that the stand character (species and structural mix) is moving in the direction specified for each Visual Quality Objective (VQO). The monitoring question is:

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

Fire restoration and thinning projects have been initiated to reduce fuels and promote healthy ecosystems. These projects are also achieving the long-term scenic character goals of a forested environment with more natural appearing landscapes characterized by scattered groups and individual large trees, varying patterns and densities, reduced scenic contrast and more open stand conditions. In the last five years, harvest practices exhibited a trend towards partial cutting and thinning; where trees are left to achieve scenic quality and other resource goals.

Several fuel reduction and thinning projects on the Forest were monitored. These areas include Fish Lake (Lake Wenatchee Ranger District (RD), the Peninsula area of Rimrock Lake (Naches RD) and Pendleton Canyon (Leavenworth RD). Thinning to reduce natural fuel loading enhanced the appearance and long-term health of these areas by moving the existing small black-bark ponderosa and Douglas-fir towards the scenic goal of having large yellow bark ponderosa pines and large Douglas-fir.

Recommendations

Continue monitoring as scheduled.

Fiscal Year 2000 Recommendations

Last year's recommendation was to continue monitoring as scheduled; this was completed.

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 Limits of Acceptable Change (LAC) Standards specified in the Forest Plan?

The fires of 2001 included several fires in wilderness; Rex, Swamp, Thirty-Mile, Boundary, Dog Creek and Windy. The severity of the fire season in 2001 resulted in these fires being managed under a suppression strategy. The impacts on the wilderness resource in most cases were fairly minor due to modified suppression tactics and rehabilitation following the fires.

The Rex Creek Fire of 2001, located along the north shore of Lake Chelan in the Lake Chelan-Sawtooth Wilderness, created the conditions for the potential spread of a Class A noxious weed, common crupina (*Crupina vulgaris*), from its present range adjacent to the fire into the newly disturbed area of the fire. An environmental analysis is being prepared that will consider possible herbicide and mechanical treatment options for the 2004 field season. The fire area will continue to be monitored for expansion of that weed population. On-going handpulling of individual plants has been used for over a decade, and has been moderately successful to date in containing the spread along the most popular trails. However, the Rex Creek Fire has the potential to spread the plants over thousands of acres.

The *National Visitor Use Monitoring* report found that wilderness use on the Wenatchee National Forest at 300,584 visits. This represents 11.8 percent of the total recreation use on the Forest.

Recommendations

Continue monitoring as scheduled.

Continue to work on application of Limits of Acceptable Change Standards for wilderness management.

Fiscal Year 1999 Recommendations

Last year's recommendations were the same as this year's recommendations; monitoring continued.

E. Cultural 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 FY2001, a total of 98 separate consultations occurred in compliance with Section 106 of the National Historic Preservation Act and in accordance with the 1997 Programmatic Agreement regarding cultural resource management on National Forests in the State of Washington (PMOA). This is an increase from FY2000 and reflects an overall increase in the number of small projects requiring heritage support. Project planning acreage ranged from a high of 23,300 acres for a fuel reduction project to less than 10 acres. Most projects required under ten acres of field inventory. Of the 98 consultations, 24 projects required Section 106 consultation with the Washington State Historic Preservation Officer (SHPO). Seventy-four (74) were handled internally per the 1997 PMOA. A total of 5,370 acres were systematically inventoried and 22 new cultural resource sites were documented. Of those sites, 21 were formally evaluated. This brings the Forest's total number of cultural resources to 1,471. More than half of the projects requiring heritage support had little or no potential to affect cultural resources and included weed eradication, permit renewals, wetland restoration within existing stream-river systems, road decommissioning and easements, and thinning. Most of the project requiring inventory were prescribed burns, summer home improvements, recreation and facilities-related projects.

Recreation, engineering and facilities staff routinely consulted with Forest archaeologists regarding the maintenance of Forest Service administrative sites, campground and trail shelters, and look-outs eligible for or listed on the National Register of Historic Places. In FY2001, 10 historic properties were enhanced, restored, or stabilized. A number of these projects were completed by supervised volunteers.

Site protection and heritage awareness was emphasized through more than 20 events that included site tours, talks, displays, newspaper articles, school and public presentations. A Forest history poster was created featuring a chronology through 2001 and historic photos. The poster has been nominated for a national Forest Service award. A number of ranger district employees included heritage awareness in their own area-specific presentations and some focused exclusively on local history. Three sites were under site stewardship (Leavenworth Ski Hill, American Ski Bowl, and Red Top Lookout). Two sites were added to the fee demo program (Cottonwood Guard Station and Fish Lake Guard Station).

The public had an opportunity to participate in two Passport in Time (PIT) projects. Projects included shake-making at a Naches District campground shelter and reroofing of the American Ski Bowl lodge. Students from the Spruce Street School in Seattle participated in a week long site test-

ing project on the Naches Ranger District. PIT volunteers and site stewards contributed over 1490 hours of service.

Through internal workforce actions and volunteer contributions, no site intrusions were reported for FY2001 because of site-and project monitoring efforts. Fifteen cultural sites were monitored to insure avoidance during project implementation.

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 currently has seven 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. In addition, the Forest is a signatory on a Programmatic Agreement governing the management of Depression Era (CCC) Administrative Structures on National Forests in the States of Washington and Oregon. In FY2000, these agreements provided guidance for the enhancement and/or rehabilitation of historic properties.

In FY2001, 11 historic properties were either restored or rehabilitated. Projects included six roofing projects (American Ridge Ski Bowl lodge, three C.C.C.-era picnic shelters, Silver Falls Guard Station, and Lucerne Guard Station); two painting projects (Chatter Creek compound); one building addition within a National Register listed compound (Leavenworth Ranger Station) and one site stabilization and rehabilitation project (Crow Cabin). The Salmon La Sac Guard Station (National Register) on the Cle Elum Ranger District was sanitized under professional contract. This effort paved the way for interior restoration in 2002.

F. COORDINATION OF FOREST PROGRAMS WITH INDIAN TRIBES

Monitoring Item -

AMERICAN INDIANS AND THEIR CULTURE

The monitoring questions are:

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

Are sites of religious and cultural heritage adequately protected?

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

The 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. Article 3 of that treaty states:

The exclusive right of taking fish in all the streams, where running through or bordering said reservations, is further secured to said confederated tribes and bands of Indians, as also the right of taking fish at all usual and accustomed places, in common with the citizens of the territory, and of erecting temporary buildings for curing them; together with the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed lands.

The heritage program shares project information equally with the Yakama Nation (Treaty tribe) and the Colville Confederated Tribes (Executive Order tribe) through distribution of the Forest's Schedule of Proposed Actions (SOPA), Passport in Time newsletters, and on a case-by-case basis for all projects involving a decision notice or decision memo. Government-to-government consultation was a major emphasis of the FY2001 program. Letters were sent to the Yakama Nation and to the Colville Confederated Tribes in a effort to establish an efficient and streamlined consultation protocol. That no comments were received suggests that the existing system is working to the satisfaction of the tribal governments. Every effort is made to identify and protect Traditional Cultural Properties (TCP). Detailed ethnographic studies, which often include discussions of TCPs, sometimes accompany heritage resource survey reports when a need is indicated. Relicensing of the Lake Chelan Dam generated two TCP reports. The nature of such properties (sites and TCPs) is kept confidential and is exempt from public disclosure. The Forest is not aware of any site intrusion in FY2001 nor is the heritage staff aware of any violation of treaty rights regarding procurement of natural resources. Through our participation in FERC relicensing for the Lake Chelan and Rocky Reach dams, our heritage staff worked closely with representatives for the Yakama Nation and Colville Confederated 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?

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

The Wenatchee National Forest recognizes and honors existing treaties and executive orders as a critical element in government-to-government relations with the Yakama Nation, Confederated Colville Tribes and other interested tribes. Protection of American Indian treaty and religious freedom-rights are incorporated into Forest decision-making. Consultation with tribes that may have an interest in management activities is initiated at the earliest stage of project planning and is carried through to completion of the project. Each year contact is made with tribal councils to identify appropriate contacts for various projects. 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.

G. SENSITIVE PLANTS, BIODIVERSITY, AND OLD GROWTH

Monitoring Item-

MAINTENANCE OF SENSITIVE PLANT POPULATIONS

The goal is to provide appropriate habitat to enhance or maintain viable populations of all threatened, endangered, and sensitive plant species. The monitoring question is:

Are sensitive plant species populations being maintained or increasing?

There are over 50 sensitive plants listed for the Wenatchee National Forest. Many are known to occur while others are suspected of occurring on the forest. All have limited distribution and some are in fairly inaccessible areas. Of the species known to occur, two are federally listed as Endangered (Wenatchee Mountains checker-mallow and showy stickseed) and five are Species of Concern. One additional species (Ute ladies' tresses), may occur on the Forest, and is listed as threatened. The Regional Forester's Sensitive Species List was revised in FY1999 to better identify those plants that having serious threats to their viability.

In order to maintain sensitive plants, all ground disturbing activities require biological evaluations; this allows the effects of activities on sensitive species to be determined and monitored on a project by project basis. The requirement to complete biological evaluations helps assure that management activities do not result in loss of viability for sensitive plant species. Project surveys for sensitive plants were done on over 9,600 acres, and resulted in new sightings of clustered lady's slipper, and long-sepalled globemallow.

Plot techniques can also be used to intensively monitor sensitive plants. The primary criteria to determine which species are monitored include: 1) rarity of the plant, 2) threats, 3) accessibility, and 4) funding.

Sometimes a specific project will have potential to impact sensitive species; this provides an opportunity for monitoring effects of that activity on the plant.

Generally, intensive monitoring has focused on rarer plants and those that have significant threats. Consequently, plants that occur in areas where management activities commonly take place often receive more attention. Plants growing in inaccessible areas may not be monitored due to lack of threats and the physical difficulty of reaching them. Funding is also an important consideration, for monitoring is an expensive endeavor. It is difficult to initiate or continue monitoring when funds are limited and not consistent from year to year.

The sensitive plants that have been monitored with plot techniques since 1990 include:

Wenatchee larkspur	Clustered lady's slipper
Chelan rockmat	Henderson's ricegrass
Thompson's clover	Smoky Mtn Sedge
Showy stickseed	Botrychium species
Long-sepalled globemallow	Sierran cliffbrake
Pine broomrape	Seely's silene

In 2001, Wenatchee Mountains checker-mallow (*Sidalcea oregana* var. *calva*) and showy stickseed (*Hackelia venusta*) were monitored using plot techniques. Informal monitoring was conducted on long-sepalled globemallow (*Iliamna longisepala*), Seely's silene (*Silene seelyi*), clustered lady's slipper (*Cypripedium fasciculatum*), Sierran cliffbrake (*Pellea brachyptera*) and Thompson's clover (*Trifolium thompsonii*).

As noted above, some monitoring activities have used very formal plot techniques while others have been much more informal and anecdotal in nature. Most of the rarest plant species occur on the Leavenworth Ranger District, and as a result, most formal monitoring has occurred on that district. However, all ranger districts completed either formal or informal monitoring of sensitive plants in FY2001. None of the surveys or monitoring suggests that any Threatened, Endangered or Suspected (TES), or Proposed (P) species are declining.

A long-term investigation of *Sidalcea oregana* var. *calva* continued. Six permanent plots across the entire range of the species were established and data were collected on a variety of ecological, biological, and morphological variables. These plots will be measured repeatedly over time to establish a baseline of information regarding this species. This information will be used to develop a species conservation strategy and recovery plan. Additionally, critical habitat was established on approximately 2,800 acres National Forest System Lands for the protection of the checker-mallow. Checker-mallow populations appear stable while showy stickseed populations may be increasing.

Finally, all NEPA documents completed on the Forest addressed sensitive plants where appropriate. Typically, the NEPA analyses used input from the required Biological Evaluations for plants.

Recommendations

Continue to address and evaluate the effects of proposed actions on sensitive plants. Establish quantitative formal monitoring as needed to protect sensitive plants and to ascertain the effects of natural and management activities on these species.

Monitoring Item-

BIODIVERSITY AND OLD GROWTH

The goal is to maintain native and desirable introduced or historic plant and animal species and communities and provide all seral stages of all plant associations in a distribution and abundance to assure species diversity and viability. A desired future condition is to establish the local needs of management indicator species, rare species, and the proportion of seral stages that allows for natural diversity. The monitoring questions are:

Are desired habitat conditions for at-risk fish stocks maintained where adequate, and restored where inadequate? (See Item J. Soil, Water, Fisheries and Related Watershed Mgt. -page 42)

Is a functional interacting, late-successional ecosystem maintained where adequate, and restored where inadequate?

Did silvicultural treatments benefit the creation and maintenance of late-successional conditions?

Will the overall conditions of the watersheds and provinces continue to be productive over the long-term? (See Item J. Soil, Water, Fisheries and Related Watershed Mgt. -page 42)

Biodiversity is essentially the variety of life and the processes that link them together and allow them to function; therefore, the amounts, kinds and distribution of listed, sensitive and survey and manage plants, old growth and noxious weeds all affect biological diversity. Monitoring of fire effects and recovery all relate to biological diversity as does the collection and use of native plant materials for restoration work.

A number of NEPA documents were completed in FY2001. These documents often addressed biodiversity and/or the components including old growth (late-successional habitat), sensitive plants,

and noxious weeds. Survey and Manage (S&M) species were also included in these analyses as directed by the *Northwest Forest Plan*. These attributes are critical components of biological diversity. Weeds affect biological diversity by excluding native plants. Old growth ecosystems, sensitive plants and survey and manage species are often limited in extent and as such can significantly impact biological diversity by changes in their extent.

Noxious Weeds

Each Ranger District completed some control efforts, and a variety of surveys were done for noxious weeds. A major effort continued to determine the status of dalmatian toadflax on the Forest. Most other weed surveys were completed as pre-work and follow-up to control efforts. Over 1100 acres of weed control using a variety of methods were completed on the Forest.

Recommendations

Become more quantitative in evaluations of weed populations and continue to seek ways to prevent noxious weed infestations.

Evaluate weed potential for all ground disturbing projects.

Monitoring Item-

SURVEY AND MANAGE PLANTS

Surveys have been ongoing for a variety of Survey and Manage (S&M) species deemed important late-successional habitat components. These include vascular plants, fungi, lichens and bryophytes (*Northwest Forest Plan ROD, January 2001 Table 1-1*). On the Wenatchee National Forest, S&M plants are primarily a concern in areas with climates strongly affected by maritime air from the western side of the State. Consequently, Naches, Cle Elum, Lake Wenatchee and Leavenworth Ranger Districts have the highest likelihood of supporting S&M plant species.

Project areas must be evaluated for suitable S&M habitat. Those areas that support S&M habitat are being surveyed following *Northwest Forest Plan* direction. In FY2001 over 9,600 acres of project-level surveys were completed for a plethora of S&M species.

Survey and Manage plants species found during surveys included:

Scientific Name	Common Name or Taxa Group, and (Status)
<i>Cypripedium fasciculatum</i>	Clustered lady's-slipper (R6 and SM)
<i>Cypripedium montanum</i>	Mountain lady's-slipper (SM)
<i>Buxbamia viridis</i>	Moss (SM)
<i>Schistostega pennata</i>	Goblin's gold moss (SM)
<i>Tritomaria exsectiformis</i>	Liverwort
<i>Hypogymnia duplicata</i>	Lichen (SM)
<i>Lobaria linita</i>	Lichen (SM)
<i>Bryoria tortuosa</i>	Lichen (SM)
<i>Acanthopysium farlowii</i>	Fungus (SM)
<i>Neournula pouchetii</i>	Fungus (SM)
<i>Otidea leporine</i>	Fungus (SM)
<i>Plectania melastoma</i>	Fungus (SM)
<i>Plectania milleri</i>	Fungus (SM)
<i>Sarcosoma mexicana</i>	Fungus (SM)
<i>Gyromitra californica</i>	Fungus (SM)
<i>Polyozellus multiplex</i>	Fungus (SM)

* Status: R6 = Regional Forester's Sensitive List; SM = Survey and Manage

Additionally, a variety of strategic surveys were completed (unrelated to project actions) in an attempt to ascertain the general abundance of S&M plant species. Most of these surveys were regionally directed contracts with contract inspection provided by district personnel. Results of these surveys have not yet been provided by the Regional Office.

Other Vegetation and Fire Monitoring

The Chelan Ranger District, continued monitoring of Burned Area Emergency Rehabilitation (BAER) measures for the North Twenty-five Mile Fire as part of normal field activities. This monitoring included long-term vegetation transects, evaluation of the rehabilitation seeding, evaluation of channel and hillslope structures and long term photo-point establishment. Riparian vegetation monitoring that began in 1994 also continued.

Recommendations

Continue to address biodiversity, either directly, or through its critical components in NEPA documents and Watershed Assessments.

Integrate assessments of Survey and Manage Species into activities as directed by the Northwest Forest Plan.

Continue to increase use of native plants for restoration and rehabilitation and monitor fire effects as needed.

Monitoring Item-

OLD GROWTH ECOSYSTEMS

See also the wildlife section for the discussion on old growth habitat and refer to the Timber Section for volume and acres harvested by method in FY2000.

Is old growth acreage being retained at the expected rate?

In 1990 *Wenatchee Forest Plan*, it was calculated that there was a total of 630,000 acres suitable for timber management activities on the Forest. Old growth acres were estimated to be about 319,000 acres, approximately fifty percent of which occurs in wilderness. It was predicted that 11,500 acres of old growth would be lost by the end of the first decade through the mechanisms of stand management, catastrophic fire and natural processes, leaving 307,300 acres of the original 319,000.

However, under the *Northwest Forest Plan*, only about 209,000 acres or 35% of the total timber base of 630,300 acres is now considered suitable for forest management activities. Because of this significant reduction in suitable forest acreage, it is even more unlikely that the predicted rate of loss of old growth stands is occurring. Probably the biggest threat to old growth forests at this time is fire. At the low level of current harvest, the accumulated growth of stands moved more acres toward an old growth condition than the number of acres removed through harvest. In fact, this “ingrowth” factor will likely accrue old growth stand conditions at a greater rate than harvest will remove.

Recommendations

Continue to follow old growth acres harvested and address the issue in NEPA documents, where applicable.

H. WILDLIFE

Monitoring Item_

MANAGEMENT INDICATOR SPECIES HABITAT

Management Indicator Species are plant or animals species identified in the *Wenatchee National Forest Land and Resource Management Plan* whose population characteristics can be used to evaluate the effects of land and resource management practices on the habitats they use. These species include old growth dependent species (such as the spotted owl and American marten), primary cavity excavators (such as pileated woodpecker, northern three toed woodpecker, and others), ungulates (elk, mule deer and mountain goats), and riparian dependent species (such as the beaver, ruffed grouse, amphibians). A summary of the monitoring that has occurred for each of these species groups is provided in the following discussion.

The areas being maintained as Old Growth and Mature Forest (OG) Associated Species were changed when the *Forest Plan* was amended in 1994 by the *Northwest Forest Plan*. OG1 and OG2 areas were originally designations for pileated woodpeckers, marten and northern three-toed woodpeckers and are no longer land allocations.

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?

Is habitat being used as expected?

Primary cavity excavators (PCEs) are considered to be keystone 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. Some of the results of this study are shown in the tables and figure below.

Number of active cavity nests of bird species in the treatments

Species	Tree Density		
	Low	Medium	High
Northern flicker	4	12	6
Hairy woodpecker	3	6	6
Black-backed woodpecker	0	1	1
Lewis' woodpecker	10	4	0
Western bluebird	5	7	2
Mountain bluebird	7	12	5
House wren	0	12	7
American kestrel	1	2	1
Total	30	56	28

Wenatchee National Forest, 1998-1999

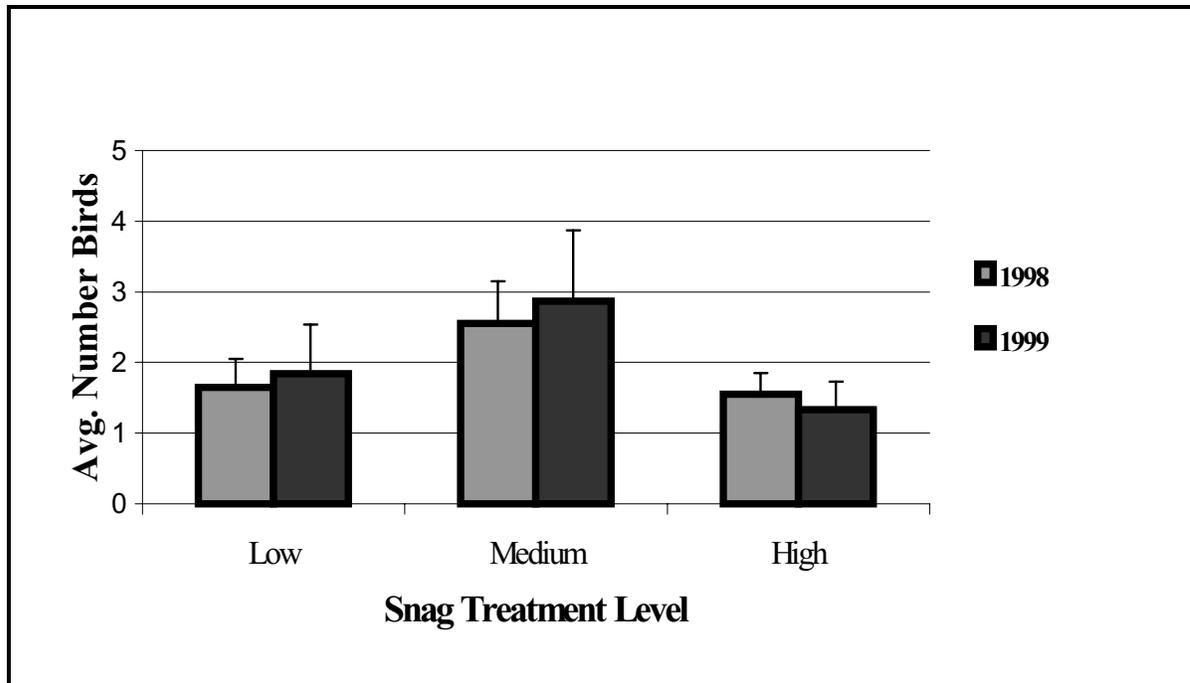
**The mean number of birds/point count station in each of the treatments,
Wenatchee National Forest, (1998-1999 averaged)**

Numbers in bold show significant differences (P = 0.05).

P = primary cavity nester, S = secondary cavity nester.

Species		Low Density		Medium Density		High Density	
		LDS1	LDS2	MDS1	MDS2	HDS1	HDS2
White-headed woodpecker (Picoides albolarvatus)	P	0.09	0	0	0.17	0	0
Lewis' woodpecker (Melanerpes lewis)	P	1.84	1.59	0	1.42	0	0
Black-backed woodpecker (Picoides arcticus)	P	0	0	0.25	0.75	1.34	0.17
Hairy woodpecker (Picoides villosus)	P	0.75	2.09	2.50	2.50	3.09	3.83
Northern flicker (Colaptes auratus)	P	1.75	2.84	4.25	3.92	3.00	2.00
Western bluebird (Sialia mexicana)	S	1.57	1.92	0.75	1.50	0.67	0
Mountain bluebird (Sialia currucoides)	S	2.33	1.59	3.25	3.67	2.25	0.67
Red-breasted nuthatch (Sitta canadensis)	S	0.09	0.17	0.34	0.75	0.25	0
House wren (Troglodytes aedon)	S	0.92	1.50	2.00	1.92	1.25	0.42
European starling (Sturnus vulgaris)	S	0.09	0.92	0	4.17	0	0.17
American kestrel (Falco sparverius)	S	0.34	1.09	0.50	1.84	0	0.17
Brown preeper (Certhia americana)	–	0	0	0.09	0	0	1.25
Northern pygmy owl (Glaucidium gnoma)	–	0	0	0	0	0	0.09

Mean number of cavity nesting birds in the three treatments areas: low, medium, and high snag density.



Haggard, M.E., and W.L. Gaines. 2001. Effects of Stand-Replacement Fire and Salvage Logging on a Cavity-Nesting Bird Community in Eastern Cascades, Washington. *Northwest Science* 75(4):387-396.

The response of cavity-nesting bird species in three snag density treatments (high = 37-80 snags/ha, medium = 15-35 snags/ha, and low = 0-12 snags/ha) was monitored during two breeding seasons, 4-5 years post-fire and logging in Douglas-fir and ponderosa pine forests. Snag surveys were used to describe habitat, and both breeding bird surveys and nest surveys were used to characterize the bird community. Stands with the medium snag density treatment had the highest abundance, species richness, and nesting population of cavity nesters. The reasons for this may be: 1) snags were not evenly distributed within a stand such that both clumped and dispersed snag density habitat were interspersed in this treatment, and 2) a greater proportion of ponderosa pine snags in medium density treatments may have attracted species that prefer ponderosa pine for nesting and foraging. Ponderosa pine was preferred for nest sites and large snags (>48 cm dbh) provided nesting habitat for more species than smaller snags. However, smaller snags were used for nesting and foraging by some species.

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 pre and post harvest snag surveys have been conducted in only a few units. Monitoring results will be presented in the 2002 monitoring report.

Recommendations

Re-sample within the fire and salvage logging study area during 2004 and 2005 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.

Fiscal Year 2000 Recommendations

Last year's recommendation was the same as this year's recommendation; monitoring continued.

Monitoring Item-

LANDBIRDS

The goal is to maintain viable populations of landbirds.

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 2002 prescribed fire treatments are being carried out and post-fire monitoring is expected to occur in 2003 and 2004. 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 is expected to occur in 2004 and 2005. Presented below are some preliminary data from the *Pendleton Study* showing the relative abundances of different bird species before and after the dry site restoration thinning treatments. A research publication is being prepared titled: *The Short-term Response of Landbirds Birds to Dry Forest Restoration*, that will provide additional details about this monitoring study. The publication should be available in the spring of 2003.

The short-term (1-3 years) response of landbirds birds to thinning treatments implemented in the Pendleton Dry Forest Restoration project are summarized as follows:

a total of 55 species were detected during the pre-treatment surveys conducted in 1996 and 1997. During the post-treatment surveys conducted in 2001, 38 species were detected. There were no significant differences in the total number of detections recorded among years ($P = 0.274$) or treatments ($P = 0.436$). Pre-treatment bird diversity was $H' = 2.551$ and post-treatment bird diversity was $H' = 2.684$. Values for the Shannon Index usually fall between 1.5 and 3.5, and only rarely surpass 4.5.

The abundance of land birds during the breeding season was evaluated in two ways. First, the abundance of individual species was evaluated for all species with >10 detections/study stand; this left 19 species to assess. Stands that were treated with thinning were compared to stands that were not treated (controls) to determine if any statistically significant differences occurred for any bird species.

Second, birds were grouped into foraging guilds based on their foraging behaviors and the abundance of birds within each guild was compared between stands that were thinned and those that were not treated.

Of the 19 bird species that were evaluated, the abundance of three bird species differed among the treatments and control stands. Cassin's finches were found in greater abundance in the control stands compared to the standard thin treatment ($P = 0.03$). Conversely, Macgivlery's warbler ($P = 0.037$) and red-breasted nuthatch ($p = 0.015$) abundance decreased in the standard thin treatment compared to the control.

The bark-insectivore foraging guild was the only guild that showed a significant trend. They significantly increased ($P = 0.026$) in abundance following the standard thinning treatments.

Recommendations

Complete post-prescribed fire monitoring of landbirds in the Pendleton Monitoring Study.

Complete post-treatment monitoring of landbirds in the FFS Study.

Publish results of short-term response of landbirds to the Pendleton Dry Site treatments and integrate findings into future restoration project designs.

Monitoring Item-

RIPARIAN DEPENDENT WILDLIFE SPECIES

The goal is to maintain viability of riparian dependent species.

Is habitat being maintained for riparian dependent wildlife species?

Riparian habitats typically support the most productive and diverse wildlife populations in temperate forest landscapes. For these reasons, it is important to monitor the populations of wildlife species that are dependent upon riparian habitats. Two efforts have been implemented to monitor riparian wildlife species. The first is an effort to monitor amphibians associated with stream riparian habitats. This effort was initiated in 1992 and it is planned to continue it as a long-term monitoring effort (although it may need to be expanded or modified). This monitoring effort samples riparian habitats along small mountain streams within Douglas-fir and mixed conifer forests. The sample sites include areas of three different riparian management strategies (unharvested, riparian buffer, no buffer). The second study was conducted by the Wenatchee Forestry Sciences Lab (J. Lehmkuhl, Principal Investigator) to monitor bird populations in streamside riparian habitats. Results from the riparian bird study are not yet available but will be presented in future monitoring reports.

Results of amphibian monitoring in streamside riparian habitats within Douglas-fir mixed conifer forests

Year	Tailed Frog	Chorus Frog	L-T Salamander	Cascade Frog	Totals
1992	31	0	0	3	34
1993	31	0	0	7	38
1995	35	0	1	8	44
1996	29	0	1	1	31
1997	15	0	0	1	16
1999	15	1	0	1	17
2001	29	0	0	6	35
Totals	185	1	2	27	215

These results include sample sites from three riparian management strategies (unharvested, riparian buffer, no buffer). These results are based on using pitfall traps to obtain estimates of amphibian abundance.

The data presented in the above table shows no upward or downward trends in the captures of amphibians within the study sites. This relationship is not statistically significant for either the total number of captures ($r^2 = 0.412$, $F = 1.020$, $p = 0.359$), for the tailed frog captures ($r^2 = 0.477$, $F = 1.471$, $p = 0.279$), or for Cascades frog captures ($r^2 = 0.185$, $F = 0.176$, $p = 0.692$). Continued monitoring is needed and consideration of expanding the monitoring to include additional sites to increase statistical power.

Recommendations

Use data from the riparian amphibian monitoring as a pilot study to determine the statistical power of determining trends in amphibian populations under the current study design. Make adjustments to the monitoring effort according to the results of this analysis.

Integrate the results of the riparian bird study into Forest Plan monitoring once they are available.

Fiscal Year 2000 Recommendations

Last year's recommendation was the same as this year's recommendation; monitoring continued.

Monitoring Item-

DEER, ELK (Forest) AND MOUNTAIN GOAT (High Elevation and Talus) HABITAT

Elk, mule deer and mountain goats use portions of the Wenatchee National Forest as summer, winter and transitional range.

Are populations of ungulates increasing, decreasing or being maintained?

Is habitat capability increasing, decreasing or being maintained?

Managing ungulate populations requires a high level of coordination with the Washington Department of Fish and Wildlife (WDFW). They are responsible for the monitoring of ungulate populations and the results of these efforts need to be incorporated into future *Forest Plan* monitoring reports. An interagency assessment of the habitat capability for the elk herds on the southern end of the Forest was initiated in 2000 and will be completed in 2002. This assessment should establish baseline information on habitat capability and result in a more accurate habitat effectiveness model than is currently available. Habitat effectiveness is evaluated on a project level basis and is important to meeting the habitat goals for these species.

During the winter of 2000 and throughout the year of 2001, the Wenatchee National Forest cooperated with the WDFW and Chelan County PUD on a study of mule deer in Chelan County. Currently, mule deer winter range habitat effectiveness is evaluated using a modified version of an elk habitat effectiveness model. Lenz (1993) tested this model and found that it did a poor job of predicting the occurrence of mule deer during the winter. Therefore, the *Chelan Mule Deer Study* presented an opportunity to develop a winter range habitat effectiveness model using local data collected during this telemetry study. It is anticipated that the study will be completed in 2003 and the results will be integrated into *Forest Plan* revision. This model will help evaluate trends in habitat effectiveness over time.

Concern has been expressed about the populations of mountain goats on the Forest, and in response, a cooperative effort between the Forest Service and the WDFW was developed to gather baseline information about their populations. Results of initial mountain goat surveys are shown in the following table.

Preliminary results of helicopter surveys for mountain goats in watersheds located on the Wenatchee National Forest

Date	No. Animals	Kids	Watershed
9/13/00	2	1	Icicle
9/27/00	3	0	Icicle
9/13/00	1	0	Wenatchee
9/27/00	9	2	Peshastin
7/26/01	22	6	Kachess
7/26/01	40	13	Blaze Ridge
8/14/01	46	14	Bumping
8/14/01	18	3	Naches Pass
9/29/01	13	0	Lake Wenatchee
9/30/01	2	0	Enchantments

Recommendations

Coordinate with the WDFW to obtain population monitoring data that can be integrated into this report for deer, elk, and mountain goats.

Complete the interagency assessment of elk habitat capability.

Collaborate with the WDFW on the Chelan County Mule Deer Study.

Revise and refine the elk and deer habitat effectiveness models based on the results of the elk habitat assessment and mule deer study.

Fiscal Year 2000 Recommendations

Last year's recommendation was the same as this year's recommendation; monitoring continued.

Monitoring Item-

NORTHERN SPOTTED OWL (*Strix Occidentalis caurina*)

The goal is to recover to a viable spotted owl population

What is the level of spotted owl productivity?

Is spotted owl habitat being maintained or restored?

Most spotted owl sites were monitored by the National Council for Air and Stream Improvement (NACSI), the Pacific Northwest Research Lab (PNW) for research purposes, or by the Wenatchee National Forest in 2001. Due to this partnership, 11 years of monitoring information on owls is available.

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	
1998	141	NA	
1999	108	26	0.2
2000*	139	57	0.4
2001	198	59	0.3

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

An assessment of the monitoring data available for the Wenatchee National Forest, shown in the above table, was completed to determine if a trends (upward or downward) occurred in the productivity at monitored owl sites. Using a simple linear model, no significant statistical trend was detected at this time.

All projects with potential effects to any federally protected wildlife species requires agencies to review actions authorized, funded, or carried out by them to insure such actions do not jeopardize the continued existence of listed species. All projects that affected spotted owl habitat have been through this screen. In 2001, a total of 23 projects were consulted on for spotted owls.

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 should be updated again in 2002 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.

Last year's recommendations were the same as this year's.

Fiscal Year 2000 Recommendations

Last year's recommendations were the same as this year's recommendations; monitoring continued.

Monitoring Item-

BALD EAGLE (Haliaeetus leucocephalus) THREATENED

The goal is species recovery.

Are existing nest sites producing young as anticipated?

Are nest, roost and perch sites being maintained?

Table showing a summary of the bald eagle monitoring information

Fiscal Year	Known Nest Sites	Known Young Produced
1989	1	1
1990	2	2
1991	2	2
1992	3	2
1993	4	4
1994	4	6
1995	4	7
1996	5	3
1997	5	4
1998	5	5
1999	4	1
2000*	4	1
2001	4	Unknown

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

These data indicate an increasing number of bald eagle nest sites and the number of young produced for the period 1989-1998. In 1999 and 2000, the number of known young that were produced was lower than the past several years. The reasons for this are unknown but may be a function of inability to monitor the nest fate closely or weather conditions. Subsequent monitoring of productivity will be important to better understand this.

All projects with potential effects to any federally protected wildlife species requires agencies to review actions authorized, funded, or carried out by them to insure such actions do not jeopardize the continued existence of listed species. All projects that affected bald eagle habitat have been through this screen. In 2001, a total of 20 projects were consulted on for bald eagles.

Recommendations

Continue to monitor nests and document the number of young produced.

Fiscal Year 2000 Recommendations

Last year's recommendations were the same as this year's recommendations; monitoring continued.

Monitoring Item-

PEREGRINE FALCONS (*Falco pergrinus*)

The goal is species recovery.

How many sites are occupied?

How many young are being produced?

The Wenatchee National Forest has achieved and exceeded the recovery goal of one active nest site. Two new nest sites were discovered in 1999 near Leavenworth. All "good or better" rated cliffs for peregrine nests have been entered into a Geographic Information System (GIS) and are being used to make project assessments.

On August 25, 1999, a notice was published in the Federal Register (64 Federal Register 46542) removing the peregrine falcon from the federal endangered species list. This is due to the continued successful recovery of this species, including several efforts made on the Wenatchee National Forest. This means that it will no longer be necessary to complete consultation with the USFWS on projects that could affect peregrine falcons. However, peregrine falcon nest sites will continue to be protected and monitored.

A summary of the peregrine falcon monitoring information

Fiscal Year	Known Nest Sites	Young Produced
1988	0	0
1989	0	0
1990	0	0
1991	0	0
1992	1	3
1993	1	2
1994	2	5
1995	2	5
1996	2-10	4
1997	2-10	7
1998	2-10	3
1999	5	9
2000	5	8
2001	6	10

The above table shows the increasing number of known nest sites and young produced on the Wenatchee National Forest. The continued increase in productivity of the peregrines on the Forest has contributed to their successful recovery.

Recommendations

Continue to monitor potential and active nest sites.

Prepare site management plans for known nest sites.

Fiscal Year 2000 Recommendations

Last year's recommendations were the same as this year's recommendations; monitoring continued.

Monitoring Item-

GRIZZLY BEAR (*Ursus arctos*)

The goal is species recovery.

Are Guidelines for the North Cascade Grizzly Bear Recovery Area being implemented as they become established?

How many Class 1 and 2 grizzly bear reports are made annually?

The *Grizzly Bear Recovery Plan* was completed in 1997 (USFWS 1997) for the North Cascades Ecosystem. Interim Access Management Guidelines and a Sanitation Policy were developed and approved for "No Net Loss" of core areas in 1998. An initial Forest-wide assessment of the availability of core areas was completed in 1998 and the results are shown in the table below. An assessment of the quality of the core areas to meet the seasonal needs of grizzly bears and to develop desired future conditions for the Bear Management Units (BMUs) is being completed in 2002. In 2001, 21 projects were consulted on for grizzly bears.

A summary of the grizzly bear core area monitoring information

Bear Management Unit	Total Acres in BMU	Early Season % Core Area	Late Season % Core Area
Chiwawa	152,726	60	55
Cle Elum	196,319	NA	35
Icicle	134,878	81	73
Lower Lake Chelan	205,822	63	54
Lower Entiat	169,801	21	21
Lower Wenatchee	225,784	40	41
Peshastin	131,124	40	41
Stehekin	107,289	NA	Na
Upper Lake Chelan	239,430	80	25
Upper Wenatchee	146,333	73	47
Swauk	161,619	NA	62

This information provides an overview of the availability of core areas within the Grizzly Bear Management Units across the Wenatchee National Forest. This information is appropriate to the broad scale assessment that was conducted, but needs to be validated and updated at the project scale. The core areas available within BMUs have been updated for some areas and may not be reflected in this table.

A summary of the grizzly bear sighting information

Year	Class 1 Observations	Class 2 Observations	Total Observations
1989	1	3	4
1990	0	9	9
1991	3	3	6
1992	0	0	0
1993	0	0	0
1994	0	0	0
1995	0	0	0
1996	0	1	1
1997	0	1	1
1998	0	0	0
1999	0	0	0
2000	0	0	0
2001	0	0	0

Recommendations

Continue to update the core area GIS layer as projects are implemented and better information becomes available.

Continue to implement the Sanitation Policy by making human garbage inaccessible to bears in our campgrounds and recreation sites.

Continue to report and follow up on grizzly bear observations in order to gather sufficient information to determine the validity of the report.

Fiscal Year 2000 Recommendations

Last year's recommendations were the same as this year's recommendations.

Monitoring Item-

GRAY WOLF (*Canis lupus*) Endangered

The goal is species recovery.

How are forest roads affecting habitat?

How many reports of gray wolves occurred per year?

Gray wolves (*Canis lupus*) historically occurred throughout the North Cascades. However, extensive predator control efforts and human expansion during the early to mid 1900's greatly reduced their numbers. Recently, gray wolves have been observed at a few locations within the North Cascades, including areas on the Wenatchee National Forest. These reports indicate that gray wolves may be recolonizing the Cascades from source populations in southern British Columbia. Presently no recovery plan or conservation strategy has been implemented for gray wolves in Washington. In 2001 a total of 21 projects were consulted on to determine their potential effects on gray wolves.

A summary of the gray wolf sightings information		
Year	Number of Confirmed and Unconfirmed Gray Wolf Reports	Number Confirmed to be Gray Wolf
1990	2	1
1991	24	1
1992	3	1
1993	0	0
1994	0	0
1995	0	0
1996	0	0
1997	2	0
1998	3	0
1999	1	0
2000	1	0
2001	5	0

In the early 1990s considerable interagency efforts were made to investigate wolf reports to determine their validity. In 1993 these efforts were greatly reduced as a result of limited funding. Because of this, fewer reports have been made and no reports have been verified for several years. This has made it very difficult to track the number and distribution of gray wolf reports over time.

Recommendations

Track road densities in GIS to monitor habitat effectiveness for wolves.

Cooperate on the development of a recovery plan or conservation strategy for the North Cascades.

Continue to follow up and evaluate wolf reports and track these in a database.

Fiscal Year 2000 Recommendations

Last year's recommendations were the same as this year's recommendations; monitoring continued.

Monitoring Item-

MARBLED MURRELET (*Brachyramphus marmoratus*) Threatened

The goal is species recovery.

Are populations and habitat being maintained?

Only a small portion of the Wenatchee National Forest lies within the range of the marbled murrelet and surveys conducted prior to habitat manipulation or disturbance have not revealed any confirmed locations or nest sites. A total of 9 projects were consulted on in 2001.

A summary of marbled murrelet sighting information

Year	General Observations	# Marbled Murrelet Reported	# Survey Station	# Marbled Murrelet Located
Pre-1989	0	0	0	0
1990	0	0	0	0
1991	0	0	0	0
1992	0	0	0	0
1993	0	0	0	0
1994	1	1	13	0
1995	0	0	14	0
1996	0	0	5	0
1997	0	0	5	0
1998	0	0	NA	0
1999	0	0	0	0
2000	0	0	0	0
2001	0	0	10	0

Recommendations

Continue to monitor projects within the range of the species.

Fiscal Year 2000 Recommendations

Last year's recommendation was the same as this year's recommendation; monitoring continued.

Monitoring Item-

CANADA LYNX (*Lynx canadensis*) – THREATENED

In 2000, the Canada lynx was listed as a Threatened species under the federal Endangered Species Act. Conservation of lynx is guided by the Canada Lynx Conservation Assessment and Strategy until a recovery plan is completed. Prior to the listing of lynx, surveys were initiated to determine the extent of lynx range in Washington and Oregon, as part of the National Lynx Survey. Several of the survey stations were located on the Wenatchee National Forest. The results of these surveys are shown in the following table. No detections of lynx were made during these surveys. In FY2001 a total of 20 projects were consulted on for lynx

Results of the 1999 -2001 lynx surveys conducted on the Wenatchee National Forest using hair snagging and DNA analysis

Year	Total Hits	Bobcat	Cougar	Lynx	Other	Poor DNA*
1999	22	7	1	0	6	8
2000				0		
2001	31	8	0	0	8	12

*Poor DNA means that analysis could not be completed.

Recommendations

Continue to monitor projects within the range of the species.

Monitoring Item-

SURVEY AND MANAGE SPECIES

Survey and Manage species were identified in the *Northwest Forest Plan* as species whose ranges are limited in extent and/or which we have little information about. On the Wenatchee National Forest mollusk and vertebrate species include 7 mollusks, 2 amphibians, and the lynx. The management strategy for the mollusk and amphibian species is to conduct surveys prior to ground disturbance activities.

Known Survey and Manage Sites for Amphibians and Mollusks

Year	Number of Survey and Manage Amphibian Sites	Number of Survey and Manage Mollusk Sites
1997		2
1998	3	20
1999	1	74
2000	0	3
2001	1	3
Total Known Sites	4	102*

*This number has been revised from last year to reflect clarifications in the taxonomy of the Chelan Mountain Snail. Sites previously considered Chelan Mountain Snail on the Leavenworth Ranger District were determined to be another snail species that is not a survey and manage species.

Recommendations

Continue surveys of projects for survey and manage mollusk species.

Monitoring the effectiveness of the mollusk management protocols where they occur in the Dry Forests.

Fiscal Year 2000 Recommendations

Last year's recommendation was the same as this year's recommendation; monitoring continued.

Summary Of Accomplishments In FY2001

Through the development of an extensive network of partnerships with other resource areas, government agencies, and private organizations, a sizeable amount of work was accomplished in FY2001 to inventory and restore wildlife habitats. Inventories and surveys were conducted over approximately 190,000 acres for species that are federally protected as Threatened or Endangered. About 45,000 acres were surveyed for other wildlife species. These surveys provide important information about wildlife numbers and their distribution, and enhance the ability to coordinate activities with other resource specialists to reduce or mitigate potential negative effects. A summary of the habitat restoration accomplishments in FY2001 is provided in the following table.

A summary of the FY2001 wildlife habitat restoration accomplishments.

Year	Wildlife Structures	Wildlife Acres	TES Structures	TES Acres
1998				
1999	144	1449	53	1534
2000		1300		200
2001		1665		100

I. TIMBER OFFERED, HARVESTED, AND RELATED SILVICULTURAL ACTIVITIES

Monitoring Item-

TIMBER OFFERED (ALLOWABLE SALE QUANTITY (ASQ) AND TIMBER SALE PROGRAM QUANTITY (TSPQ)

The goal was to achieve planned and assumed volumes of timber sold annually for the planning period in ASQ and TSPQ from FY1990 to FY1993. Since 1994, the goal stated in the *Forest Plan* has been amended by the *Northwest Forest Plan*. The new term to describe timber offered is called “probable sale quantity” (PSQ). The objective is to estimate sale levels likely to be achieved (PSQ) as opposed to estimating the ceiling or upper-limit harvest levels (ASQ). The PSQ in the amended *Forest Plan* is to sell 24.2 million board feet per year.

Fiscal Year	Timber Offered (MMBF)	Timber Harvested (MMBF)
1993	16.8	58.4
1994	12.0	32.5
1995	98.8	19.9
1996	92.5	91.7
1997	50.4	56.4
1998	43.2	27.0
1999	27.7	34.3
2000	38.4	20.4
2001	20.0	20.2
Average	44.4	40.1

Timber harvested during the FY2001, as reported in the Timber Cut and Sold Summary, is 20.2 MMBF. Timber volume harvested over the last five years has averaged 31.7 MMBF. The average is above the PSQ 24.2 due to the volumes removed from the salvage of timber from the wildfires of 1995. Since then, the volumes harvested have been reduced and are reflective of what would be expected, based on the *Northwest Forest Plan*.

Another indicator utilized is the Program Sale Statement (PSS). The PSS is used as a source of annual program accomplishment in terms of area and volume by timberland suitability class, harvest activity, forest-type group, and product. Cumulatively, this information reflects total *Forest Plan* accomplishment relative to the long-term sustained yield capacity or the allowable sale quantity (FSM 2492.12). The PSS for the Wenatchee National Forest is on the following table.

Program Sale Statement Table

Fiscal Year	Chargeable (MBF)		Non-Chargeable (MBF)	
	Dead	Live	Dead	Live
1993	11,334.45	1,422.17	3,889.25	35.6
1994	6,044.34	7,820.47	2,,389.53	181.2
1995	52,317.96	444.80	2,008.49	3.0
1996	62,512.39	12,783.70	6,152.15	13.8
1997	5,242.31	5,049.11	22,482.81	146.2
1998	7,920	4,247.9	20,453.9	4,910.4
1999	4,906.85	12809.86	2793.35	1200.61
2000	321.95	15504.22	3380.75	1484.07
2001	811.53	23525.72	3930.28	1446.19
Average	16823.53	9289.77	7497.83	1046.79

Note: Chargeable volume is volume removed from land allocations that are part of the suitable timber base, and non-chargeable volume is volume removed from land allocations outside the suitable base.

The PSS volume for FY2001 went up 44 percent from the previous year. The direction in the *Forest Plan* states that the PSQ levels are estimates. They represent neither minimum levels that must be met, nor maximum levels that cannot be exceeded. They are rough approximations because of: 1) the difficulty associated with predicting actual timber sale levels over the next decade, 2) the when and where to offer timber sales, and 3) the complex task the agency has to develop new timber sales that conform to a multitude of planning amendments.

Average volume of the Program Sale Statement for the last five years is 28.5 MMBF. The average is above the PSQ 24.2 due to the volumes removed from the salvage of timber from the wildfires of 1995. Since then, the volumes from the Program Sale Statement have come down and are reflective of what would be expected, based on the *Northwest Forest Plan*.

The PSQ on the Wenatchee National Forest is conforming to the direction addressed in the *Northwest Forest Plan*. PSQ estimates for *Northwest Forest Plan* Forests were amended for Region 6 and the Wenatchee National Forest estimates remained the same (Letter from Regional Forester, 12/1/98 - 1920/2410).

Recommendations

Continue to sell timber as directed in the *Forest Plan*.

Continue to monitor PSQ utilizing the STARS and PSS databases and compare volume to projected decade trend.

Fiscal Year 2000 Recommendations

Last year's recommendation was the same as this year's recommendation; monitoring continued.

Monitoring Item-

TIMBER HARVEST UNITS (SIZE, SHAPE AND LOCATION)

The goal is to manage vegetation cover to meet direction on size of openings created by National Forest timber harvest. The monitoring question is:

Are the Forest Plan Standards and Guidelines regarding the size and dispersal of openings and condition of adjacent vegetation (e.g. height of trees in adjacent areas) being appropriately implemented?

Based on the PSQ of 24.2 MMBF, the amount of clearcutting that would be expected is 484 acres per year (based on the original *Forest Plan* assumptions). During FY2001, 20.2 MMBF was harvested from 2,758 acres. There were no regeneration cuts, 1,086 acres were selection cuts and the remaining 1,672 acres were thinning cuts. The timber program focus for the immediate future is thinning in dry forest areas to reduce the potential for large crown fires as experienced in 1984, 1994, 1998, 1999, 2001, and 2002. Consequently, the program involves very little clearcutting.

Harvest Type (in acres) FY1996 to 2001										
Fiscal Year	Clear Cut	Prep Cut	Seed Cut	Removal Cut	Select Cut	Improve. Cut	Thin Cut	Sani. Cut	Special Cut	Total Cut
1996	9	0	0	138	348	0	0	13074	0	13569
1997	0	279	32	12	172	0	270	4731	0	5496
1998	12	25	129	26	213	0	307	727	0	1439
1999	19	0	12	359	909	0	706	412	0	2417
2000	0	0	46	0	123	0	1748	144	0	2061
2001	0	0	0	0	1086	0	1672	0	0	2758
Avg.	8	61	44	107	353	0	606	3818	0	4996

Table #20-Reforestation and timber stand improvement accomplishment report)

From FY1996 to FY2001, very little acreage has been harvested using silvicultural systems that create openings in the forest landscape. The priority has been to treat landscapes that are overstocked with thinnings from below to reduce fuels, and to salvage trees that have been damaged by wildfires, insects and disease. As a result of this *Dry Forest Strategy*, the size and dispersal of openings and condition of adjacent vegetation meet the *Forest Plan* Standards and Guidelines, as amended by the *Northwest Forest Plan*.

Volume sold during FY2001 indicates the same trend as above (PSS Report 44B). No clear cuts are scheduled or planned for any timber sales sold during FY2001. Only selection, thinning and sanitation cuts were planned for the volume sold in FY2001. Large stand replacing fires are creating large openings on the forest, but this is not due to planned or accomplished harvest activities.

The Wenatchee National Forest is meeting its *Forest Plan* Goals and Objectives. The decrease in harvested acres from the 1990 *Forest Plan*, along with the shape, size, and location has been accomplished and coincides with the new goals and objectives in the *Forest Plan*.

Recommendations

Continue monitoring as scheduled.

Fiscal Year 2000 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

Monitoring Item-

TIMBER HARVEST

The goal is to ensure that regeneration harvests are not prescribed for areas where average annual growth has not generally reached culmination of the mean annual increment. The monitoring questions are:

Are stands being harvested at an age and condition that produces the expected growth measured on an average annual cubic foot basis?

Is the amount of volume removed consistent with amounts sold?

Since 1993, the two issues that have been directing the timber harvest have been the *Northwest Forest Plan* requirements and salvage efforts related to fires. This has reduced the regeneration harvest (clearcuts) acreage to nearly zero. The focus has been to harvest fire salvage (sanitation/selective tree removal) and thinning from below on overstocked stands, especially on the drier ecosystems within the Matrix allocation and associated Late-successional Reserves.

Acres treated will remain high as harvest shifts towards thinning of small trees with low timber volume at a landscape level scale. In the next few years, the majority of the PSQ volume will come from *Dry Site Strategy* sales.

Timber sales sold during FY2001 reflect the strategy for the management of dry forest vegetation. The purpose of the timber sales is to reduce fuels, reduce large wildfires, improve long-term ecosystem sustainability and be economical. These goals are being attained.

Stands being scheduled for regeneration are within 5 percent of the culmination of mean annual increment. The Timber Sold/Harvested Table shows the current and past levels of timber sold/harvested.

The harvest volume over the last five years has averaged 35.6 MMBF per year. The amount has been consistent with the *Forest Plan* as amended by the *Northwest Forest Plan*. The higher amounts harvested reflect the volume removed from wildfires that occurred during 1994. Since then, the amount harvested, especially from regeneration or clearcut acres, has been lower and continues to reflect the *Northwest Forest Plan* direction.

The volume harvested in the last five years have been harvested at an age and condition that produces the expected growth measured on an average annual cubic foot basis. The trees that are being thinned from below or salvaged are trees that have very slow growth rates and are suppressed and need to be thinned from the stand to help maintain or improve the vigor of the remaining trees.

Timber/Sold Harvested

Fiscal Year	Timber Sold (MMBF)	Timber Harvested (MMBF)
1993	20.2	58.4
1994	16.1	32.5
1995	54.5	19.9
1996	80.5	91.7
1997	30.7	56.4
1998	29.1	27.0
1999	15.5	34.3
2000	20.7	20.4
2001	29.7	40.1
Average	33.0	42.3

Recommendations

Continue monitoring as scheduled.

Fiscal Year 2000 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

Monitoring Item-

SILVICULTURAL PRACTICES

The goal is to ensure that silvicultural prescriptions are appropriate, effective and consistent with resource objectives for each management area. The monitoring questions are:

How many acres of each planned silvicultural practices have been accomplished?

Have silvicultural prescriptions met objectives set for each management area?

Are managed stands growing at the rates estimated by Forest Plan yield models?

Summary of silvicultural activities for 2001						
Silvicultural Activities	2001	2000	1999	1998	1997	1996
	Acres	Acres	Acres	Acres	Acres	Acres
Release and weeding	576	160	134	271	598	410
Precommercial thin	2776	1,853	1251	1672	1467	756
Pruning	726	614	291	258	0	5
Fertilization	0	18	0	28	46	103
Acres planting	5107	6,966	3462	9247	10256	5858
Site prep. for planting or seeding	119	309	312	499	280	863
Animal damage control	203	25	737	775	679	117
Harvest- Clearcut	0	0	19	12	0	9
Harvest- removal cut (prep/seed/removal)	0	46	371	180	323	138
Harvest- selective cut (select/thin)	2758	1871	1615	520	442	348
Harvest- sanitation	0	144	412	727	4731	13074
Natural regeneration without site prep.	1084	6154	9371	6987	6361	8514

The silvicultural prescriptions have been implemented to foster and promote the different types of land attributes in the *Forest Plan*. The different types of silvicultural prescriptions are meeting the objectives for each type of management area.

The current program is aimed at the salvage from the wildfires and reducing the overstocked stands in the dry forest ecosystem. The original intent of the *Forest Plan* was to establish plantations on lands that were allocated as General Forest. The use of improved growing stock and an aggressive tree improvement program were aimed at making sure the *Forest Plan* was implemented. To a lesser degree, the Wenatchee National Forest is continuing to utilize the TSI approach, but with a focus at treating landscapes instead of individual trees or stands. As a result of the *Dry Site Strategy*, the WNF is applying prescriptions to reduce stocking levels so growth will be maintained on sites that already have met maximum stand density index. The current silvicultural prescriptions are meeting the intent of the *Forest Plan* to insure that stands are growing at rates that are being estimated by yield models.

The last five-year trend is consistent with the Wenatchee *Forest Plan*. The Forest continues to stress treating landscapes instead of stands or trees. The silvicultural treatments reflect an upward trend in TSI, especially in precommercial thinnings, prunings, and commercial thinnings. The major obstacle to achieving silvicultural goals is funding in timber stand improvements, especially for pre-commercial thinnings. This trend has not changed, mainly due to funding reforestation as a higher priority and not funding the overall Forest needs, both locally and regionally.

Recommendations

Continue monitoring as scheduled.

Fiscal Year 2000 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

**Monitoring Item-
REFORESTATION**

The goal is to minimize the amount of time between the removal of existing trees and reforestation with desired species. The monitoring questions are:

Is adequate tree stocking for each management area achieved within the time frame established with the desired silvicultural method?

Have adequate numbers of trees of desired species been established to realize optimum growth for management area?

The Wenatchee National Forest monitors reforestation by tracking the acres that are reforested every year. The tracking is accomplished by, and reported in, the Silva Database in TRACS and in the Survival and Growth Report.

Many of the acres reforested were not harvested. There is no direct relationship between acres reforested and acres harvested within the burned areas. Some areas did not need to be reforested because of natural regeneration, unsuitability to reforestation or adequate stocking levels.

During FY2001, 8298 acres were planted with tree seedlings, or were reforested naturally. Most of the acres were planted in stands that were burned in wildfires.

The *Survival and Growth Report* is based on field surveys conducted by ranger district personnel and field visits by the Resources Staff. The field visits indicated that the appropriate species and planting stock are being utilized on sites that required reforestation. First year survival for FY2001 was 86 percent and third year survival was 71 percent. The lower third-year survival rates are a result of planting seedlings in the drier and less fertile sites of the 1994 fires on the Entiat and Chelan Ranger Districts. The use of bare root 1-1 stock versus 1-0 plug stock on these drier sites will be utilized to improve survivability. The report shows that 93 percent of the acres reforested were satisfactorily stocked at the time of the third-year exam; and 89 percent of all acres certified in FY2000 met prescribed stocking objectives with one treatment.

**Five-year growth and survival report
FY2001-1996**

Fiscal Year	1 st Year Survival %	3 rd Year Survival %	Sat. stocked By 3 rd exam %	First time Success %
2001	86	71	93	89
2000	82	73	96	100
1999	82	78	97	95
1998	74	64	89	94
1997	87	72	94	92
1996	76	82	85	88
Average	81	73	92	93

The six-year average, as indicated in the table above for growth and survival, is fairly consistent. First-year survival averages 81percent, while third-year survival averages 73 percent. Prior to *Northwest Forest Plan* amendment, survival rates used to be higher because the Forest was harvesting higher quality, more mesic sites that were easier to reforest and more effort was utilized via KV funding to do site preparation. The Forest continues to plant a variety of species and continues to monitor

growth and survival of tree seedlings planted over a three year period to insure adequate numbers of trees are being stocked.

Recommendations

Utilize 1-1 bare root or plug-1 stock with large roots to help increase survivability. Do not use 1-0 stock on dry lower elevation ecosystems.

Continue monitoring as scheduled.

Fiscal Year 2000 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

Monitoring Item-

LANDS NOT SUITABLE FOR TIMBER MANAGEMENT

The goal is to verify that technology and/or other information has not been developed to justify reclassifying lands from a "not suitable" status to "suited for timber management", or vice versa. The monitoring questions are:

Have the lands that were identified in the Forest Plan as not suitable for timber management now become suitable for timber management?

Is the suitable/not suitable land classification accurate as identified in the Forest Plan database?

Suitability is being monitored at the ranger districts by the silviculturist. There appears to be no problems with identifying acres that do not meet *Forest Plan* Standards and Guidelines. Any new changes are being updated in the GIS database.

Recommendations

Continue to determine suitability during site specific project analysis.

Continue to update the Wenatchee National Forest GIS layer that keeps track of suitability.

Continue to monitor the reforestation success on all lands that are harvested or deforested by wildfire, especially on the drier, low elevation sites that tend to have more difficulty regenerating.

Fiscal Year 2000 Recommendations

Last year's recommendations were the same as this year's recommendations; monitoring continued.

J. SOIL, WATER, FISHERIES AND RELATED WATERSHED MANAGEMENT

Monitoring Item-

MAINTENANCE OF LONG-TERM SOIL PRODUCTIVITY

The goal is to manage the soil resources by implementing management practices that maintain or enhance productive soil nutrient and water cycles. The monitoring question is:

Is soil productivity being protected?

Soil productivity may be reduced by the mechanisms of compaction, erosion, mass failure, severe burning, and negative alteration of nutrient cycling. To maintain soil productivity, all natural soil processes should be maintained.

The Forest Plan Standard states that no more than 20 percent of an activity area shall be in a detrimentally disturbed soil condition, including roads and landings. Detrimental soil conditions include compaction, displacement, erosion, puddling, and severe burning. A second Forest Plan Standard stipulates the minimum amount of intact ground cover one and two years after an activity, dependant on the erosion hazard of the soil.

The Wenatchee National Forest is incorporating mitigation measures for soil compaction effects related to vegetation treatments in compliance with regional soil quality standards and project NEPA documents. The Forest is updating policy on ground based vegetative treatments. In 2002, a soil type risk assessment will be initiated for detrimental disturbance with expected completion in 2003. A contractual agreement for soil risk assessment related to the effects of fire is slated for completion in early 2003.

Recommendations

Continue to monitor soil rehabilitation techniques.

Emphasize early documentation of existing soil resource conditions.

Update and revise the Ground Based Harvest Policy to incorporate new monitoring results and to incorporate the Okanogan National Forest into the policy.

Reevaluate and refine winter harvest methods

Utilize yarding equipment that maximizes trail spacing and minimizes trail widening and off-trail displacement.

Emphasize skid trail spacing and width and encourage operator practices that achieve better results.

Emphasize leaving skid trails and landings in a condition that facilitates effectiveness of selected restoration treatment. For example, in a skid trail that will be treated with a self-drafting winged subsoiler, reduce wood and stumps in the skid trail.

Monitoring Item –

FISH/RIPARIAN STANDARD AND GUIDELINE IMPLEMENTATION

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

Watershed Restoration:

The Mitchell Creek watershed, located on the Chelan Ranger District, was burned by high intensity fire in the summer of 1970. The fire destroyed nearly the entire Douglas-fir and ponderosa pine overstory and consumed much of the organic soil matter. Salvage logging after the fire, reduced the large woody debris available for hillslope and channel processes over both the short and long terms. Despite rehabilitation efforts such as aerial seeding, tree transplanting and installation of channel structures, recovery was slow. Post fire flood events in 1972 and 1976 resulted in extreme runoff, surface and mass soil erosion, and channel down cutting. In 1991, an intensified program of riparian and upland treatments was applied on a sustained basis to move the watershed toward recovery.

Several projects and sites in the Mitchell Creek watershed were monitored in June, 2001 to determine the success of the various treatments in achieving long term objectives. The goal is to monitor a variety of treatments on selected sites within the drainage to determine if these treatments were effective in achieving the intended purpose of establishing a trend toward reducing erosion on hill slopes, cut slopes, and channels and to accelerating riparian and upland habitat recovery on heavily disturbed sites.

Projects included:

- Installation of living alder and willow bundle dams to help establish riparian vegetation and better regulate stream flow
- Noxious weed control
- Conifer and riparian planting,
- Placement of contour structures to help trap sediment along eroding hill slopes, cut slopes and abandoned road beds
- Bitterbrush pruning
- Seeding native brush species
- Stream channel stabilization,
- Road drainage, stabilization and obliteration
- Wildlife range improvements

General Observations and Comments:

- Overall the watershed looked much improved since the project began in 1992.
- Improvements of riparian conditions were particularly noticeable. Vegetation was vigorous in the lower drainage.
- Weeds were pervasive along FS Road #8200 leading to and within the Mitchell Creek drainage. Dalmatian toadflax was invading and a number of patches were mapped along the road and hillside.

- Recommend aggressive treatment of Dalmatian toadflax in this area.
- For more information, refer to the 2001 Watershed Restoration Monitoring Report for the Mitchell Creek Watershed Restoration Project.

Culverts:

Since 1989, the Forest has been conducting road crossing surveys to identify passage barriers. Many road-related passage barriers were replaced after the 1995 floods and later with Jobs-in-the-Woods funds. The Forest has also been active in providing technical assistance to other local agencies, primarily the Chelan County Departments of Planning and Public Works, in the planning and funding of priority off-forest passage restoration through the Washington State Salmon Recovery Act, Wyden Amendment and other programs.

All culverts on known-fish bearing streams on National Forest land in the Naches, Yakima, Wenatchee, Entiat and Chelan watersheds have been surveyed. Culverts were classified as “red,” “grey,” or “green.” Red culverts are passage barriers to some fish species/life stage during some portion of the year. Green culverts are not passage barriers. Grey culverts require further evaluation.

Naches Subbasin:

A total of 75 culverts were surveyed on the Naches Ranger District in 2000. An additional 74 were surveyed in 2001, for a grand total of 149 culverts surveyed. This completes all culvert surveys on known fish-bearing waters on this district.

Naches Subbasin-Summary of Passage Ratings by Watershed

Watershed	Green	Grey	Red	Total Crossings Surveyed
American	1	1	3	5
Bumping	0	1	10	11
Upper Tieton	5	3	31	39
Lower Tieton	0	3	10	13
Rattlesnake	1	2	6	9
Little Naches	2	1	27	30
Naches	6	2	32	40
Wenas	0	0	2	2

Naches Subbasin-Miles of Assessed Habitat Blocked by Species/Life Stage (Includes red only)

Watershed	Steelhead Adult/juv.	Chinook Adult/juv.	Bull Trout Adult/juv	Cutthroat Adult/juv.	Rainbow Adult/juv.
American	0/0	0/0	0/0	0/0	0/0
Bumping	0/0	0/0	8.2/8.2	8.2/8.2	10.2/10.2
Upper Tieton	0/0	0/0	3/3	16/16	0/0
Lower Tieton	0/0	0/0	13/13	14.8/14.8	14/14
Rattlesnake	0/0	0/0	0/0	1.8/1.8	0/0
Little Naches	0/0	0/0	0/0	0/0	23/23
Naches	12.5/12.5	12.5/12.5	17.7/17.7	39.1/39.1	24.5/24.5
Wenas	0/0	0/0	0/0	0/0	0/0

Note a total of nine open-bottomed arches were surveyed. Each of these arches was installed to provide fish passage. Four of the nine received a red rating and the remaining five received a green rating. The red rating resulted because the span of the arch was not as wide as the bank full channel width. The four arches are likely providing fish passage at flows less than bank full for adults and juveniles, but not at bank full and greater flows, especially for juveniles. Further evaluation of these sites is needed.

Upper Yakima Subbasin:

All known culverts on fish-bearing streams on National Forest lands in the Upper Yakima have been surveyed. In 2000, 94 road crossings were surveyed and 19 crossings were surveyed in 2001. An additional 31 bridge crossings on fish-bearing streams were determined not to be passage barriers, but were not entered into the culvert database.

Upper Yakima Subbasin- Summary of Passage Ratings by Watershed

Watershed	Green	Grey	Red	Total
Cle Elum	1	3	12	16
Yakima	8	6	24	38
Teanaway	2	1	5	8
Swauk-Naneum	5	0	31	36
Taneum-Manastash	3	3	9	15
Total	19 (17%)	13 (12%)	81 (72%)	113

Upper Yakima Subbasin-Miles of Assessed Habitat Blocked by Species/Life Stage (Includes red only)

Watershed	Steelhead Adult/juv.	Chinook Adult/juv.	Bull Trout Adult/juv	Cutthroat Adult/juv.
Cle Elum	0/0	0/0	2.0/2.0	4/4
Yakima	0/1.2	0/1.2	2.5/3.7	12.8/12.8
Teanaway	1.4/1.4	1.4/1.4	1.4	2.4/2.6
Swauk-Naneum	0/0	0/0	0/0	9.4/9.4
Taneum-Manastash	4.5/4.5	2/2	0/0	8.8/8.8

Chelan Subbasin:

All ten identified culverts on fish-bearing streams on National Forest in the Chelan subbasin were surveyed in 2000.

Chelan Subbasin-Summary of Passage Ratings by Watershed

Watershed	Green	Grey	Red	Total Crossings Surveyed
Chelan	1	1	8	10

**Chelan Subbasin-Miles of Assessed Habitat
Blocked by Species/Life Stage (Includes red only)**

Watershed	Steelhead Adult/juv.	Chinook Adult/juv.	Bull Trout Adult/juv	Cutthroat Adult/juv.	Rainbow Adult/juv.
Chelan				1/1	4.9/4.9

Entiat Subbasin

A total of 29 culverts were identified on fish-bearing streams on the Entiat Ranger District were surveyed in 2000.

Entiat Subbasin-Summary of Passage Ratings by Watershed

Watershed	Green	Grey	Red	Total Crossings Surveyed
Mad	3	4	7	14
Mud	1	0	3	4
Stormy, Potato	1	1	4	6
Lake, Pope, Silver	2	0	3	5

**Entiat Subbasin-Miles of Assessed Habitat
Blocked by Species/Life Stage (Includes red only)**

Watershed	Steelhead Adult/juv.	Chinook Adult/juv.	Bull Trout Adult/juv	Cutthroat Adult/juv.	Rainbow Adult/juv.
Mad	1.5/1.5	1.5/1.5	1.5/1.5	3.5/3.5	3.5/3.5
Mud	0/0	0/0	0/0	0/0	0/0
Stormy, Potato	1/1	0/1	0/0	0/0	4/4
Lake, Pope, Silver	0/0.25	0/0	0/0	0/0	0.25/0.25

Wenatchee Subbasin:

123 culverts were identified on fish-bearing streams on national forest land in the Wenatchee subbasin. 120 culverts were surveyed in 2000, and the final 3 culverts were surveyed in 2001.

Wenatchee Subbasin-Summary of Passage Ratings by Watershed

Watershed	Green	Grey	Red	Total Crossings Surveyed
Chiwawa	3	0	16	19
White	2	0	1	3
Little Wenatchee	2	2	11	15
Nason	4	2	8	14
Beaver, Clear	3	2	4	9
Chumstick	5	0	15	20
Icicle	1	1	4	6
Peshastin	5	0	12	17
Mission	4	1	11	16
Lower Wenatchee	0	1	3	4

Wenatchee Subbasin-Miles of Assessed Habitat Blocked by Species/Life Stage (Includes red only)

Watershed	Steelhead Adult/juv.	Chinook Adult/juv.	Bull Trout Adult/juv	Cutthroat Adult/juv.	Rainbow Adult/juv.
Chiwawa	4.65/4.65	4/4	0/0	17/17	11.9/11.9
White	1.5/1.5	0/0	1.5/1.5	0/0	1.5/1.5
Little Wenatchee	0/0	0/0	1.5/1.5	2.25/2.25	4.45/4.45
Nason	0.7/0.7	0/0	0/0	0/0	0.7/0.7
Beaver, Clear	2/2	0/0	0/0	0/0	2/2
Chumstick	3/3	0/0	0/0	0/0	7.3/7.3
Icicle	0/0	0/0	0/0	0/0	2.1/2.1
Peshastin	6.4/6.4	0/0	0/0	0/0	9.7/9.7
Mission	9.8/9.8	0/0	0/0	0/0	9.8/9.8
Lower Wenatchee	3.2/3.2	0/0	0/0	0/0	3.2/3.2

Recreation:

Construction of the new Hidden Lake Trail and Trailhead was completed in the summer of 2001 on the Lake Wenatchee Ranger District. Several conservation measures and design criteria were incorporated into the contract to maintain consistency with the Aquatic Conservation Strategy Objectives (ACSO). The project is located on lands allocated as Matrix and Riparian Reserve within the Forest Plan, as amended. The trailhead was located outside of Riparian Reserves and away from seasonally wet ephemeral draws however; the trail does traverse along an ephemeral draw and involves a stream crossing near the outlet of Hidden Lake.

There is no suspected use of Hidden Lake or its outlet, Hidden Creek, by ESA listed fish. Due to the stocking history in Hidden Lake, it is likely the outlet is occupied by westslope cutthroat trout and eastern brook trout. Monitoring consisted of a review of the project description as recorded in the Decision Notice and Fisheries Biological Assessment coupled with a review in the field. Objectives were to determine if projects were implemented as described and document variances and rational.

All design criteria and conservation measures were incorporated into the construction activities with the exception of transplanting vegetation onto bare soils and into the decompacted skid road

prisms. The exclusion of transplants most likely will not compromise the ACS objectives as the roads are located outside of Riparian Reserves and away from seasonally wet ephemeral draws. Furthermore, road rehabilitation projects in similar land types and precipitation gradients recover rapidly due to ample precipitation, decompacted soils, and restricted use (no motorized use). The lack of revegetation is primarily a scenic concern, as the roads still appear as roads since the “open corridor” is not visually broken up.

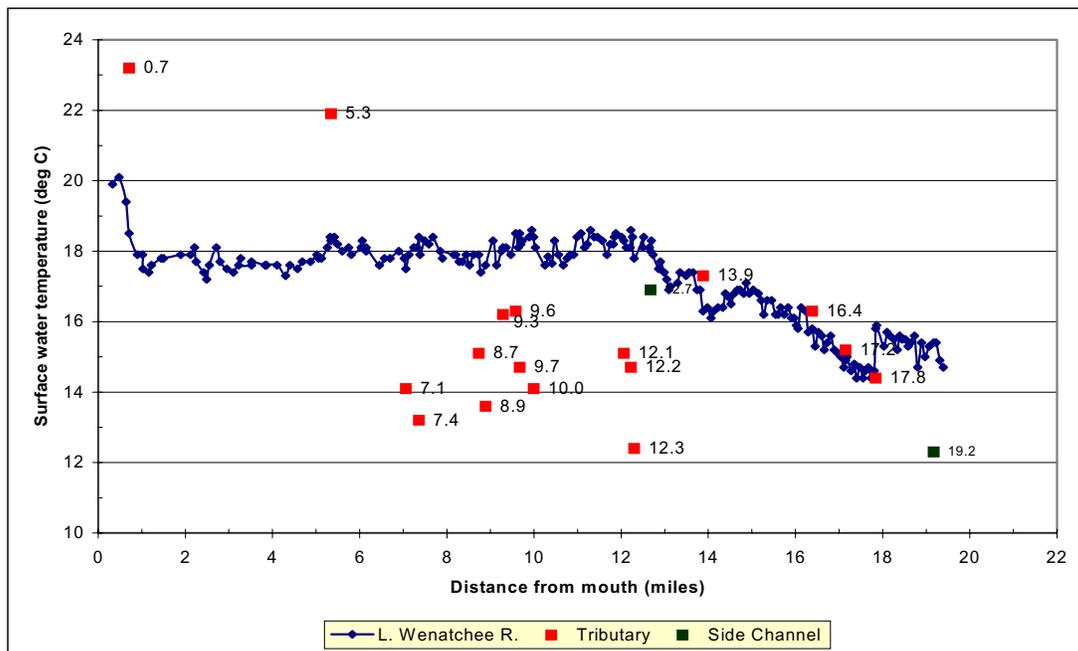
Forward Looking Infrared (FLIR):

The FLIR data offers a new dimension of analysis of water temperature variability. Prior to this work, there was only an increasing time series period of record for a relatively few sample locations. With the FLIR, there is now a picture of the spatial dimension showing variability over the entire system for one point in time. The objective of this sampling approach was to gain further insight as to important ecological factors affecting water temperature and their variability across each of the watersheds sampled.

FLIR remote sensing surveys in the Entiat River basin included the Entiat River on August 11, 2001 and the Mad River on August 12, 2001. FLIR was completed in the Wenatchee River Subbasin in August of 2001 for the Chiwawa River, Little Wenatchee River, Nason Creek and Wenatchee River from Lake Wenatchee to the town of Leavenworth at the mouth of Tumwater Canyon. Flights were made over the watersheds August 12, 13, and 14, 2001, respectively, which coincidentally were the days of highest maximum water temperature as measured at the sampling sites. Surveys were also completed in the Yakima River Basin on September 2 and 4, 2001. Rivers surveyed include the Teanaway, West Fork Teanaway, Middle Fork Teanaway, North Fork Teanaway, Cle Elum, Little Naches, Bumping and American Rivers. Low elevation rotary aircraft collected the imagery flying up-stream over the stream channel during the approximate daily maximum thermal warming period. Stream temperature and stream flow measurements were collected for major stream reaches and tributaries during that same period of time as the FLIR flights.

An example of a longitudinal temperature profile of a stream system is shown below. It illustrates a continuous line of water temperature values as a function of river mile distance. The median temperature for each of literally thousands of FLIR sampled images was plotted versus the corresponding river mile. The plot also contains the median temperature of all surface water inflows, including tributaries and canals, and off-channel features such as side-channels and backwaters that were visible in the imagery where they input to the streams. Tributaries are labeled by river mile. The value of this presentation is the display of very detailed spatial temperature variability for the entire river system at one point in time.

An example of FLIR Imagery, Little Wenatchee River, August 13, 2001.



Recommendations

Continue to monitor the function of open-bottom arches.

Continue to monitor watershed restoration projects

Incorporate the use of FLIR technology to increase understanding of ecological factors at work in watersheds.

Monitoring Item –

EFFECTIVENESS OF RIPARIAN STANDARDS AND GUIDELINES

Are Standards and Guidelines that describe Desired Future Conditions for specific riparian areas/fish habitat being met?

Standards and Guidelines that describe desired future conditions are not being met in all riparian/aquatic areas. There are two reasons for this: (1) some of the Standards and Guidelines need refinement; and (2) some of our riparian/aquatic areas are not in a “healthy” (all natural processes functioning appropriately) condition.

Aquatic zones protected by the Forest Plan include streams, lakes, and wetlands and their riparian zones, as well as unstable slopes (because they may be significant source/delivery zones for channel materials). Monitoring to date has focused on streams and lakes.

Monitoring programs to assess the condition of riparian areas and fish habitat include: stream surveys, hydrologic surveys, stream temperature monitoring, spawning gravel fine sediment monitoring, high lakes monitoring, and macroinvertebrate monitoring.

Fine Sediment in Spawning Gravels in Streams: Fine sediment in spawning riffles is monitored with McNeil Core samples following the Yakama Indian Nation Protocol (see Appendix C of 1998 Lake Wenatchee and Leavenworth Sediment Report).

Entiat Ranger District

Sediment sampling results from the Entiat and Mad Rivers are shown in the figure below. Sample mean percent fines ≤ 1.0 mm were 19.93 percent, 15.94 percent, 13.72 percent, and 18.15 percent in Entiat Reaches 1, 2, 3, and 4, respectively. Mad River Reach 1 sample mean percent fines ≤ 1.0 mm were 18.15 percent. Figure 1 shows 1993 through 2001 results for comparison. Sample mean percent fines ≤ 0.85 mm were 18.1 percent, 14.02 percent, 11.7 percent, and 16.3 percent in Entiat Reaches 1, 2, 3, and 4, respectively. Mad River sample mean percent fines ≤ 0.85 mm were 15.89 percent.

This year's results compare fairly closely to the nine-year reach grand means in the Entiat and Mad Rivers (see Figure 1). The 2001 mean percent fines for Entiat River Reach 1 was 19.93 compared to a nine-year grand mean of 19.53. The same comparison for Reach 2 was 15.94 versus 15.56, Reach 3 was 13.72 versus 13.56, Reach 4 was 18.15 versus 16.33, and Mad River was 18.15 versus 17.54. All sampled reaches except Entiat Reach 1 showed slight (~2%) decreases from last year. Reach 1 showed a fine sediment increase of 2.83% from 2000 to 2001. All reaches except Reach 1 appear to be experiencing short-term (last 5 years) increases in fine sediment. The Reach 1 trend is unclear and can be interpreted as either a long-term decrease or short-term increase.

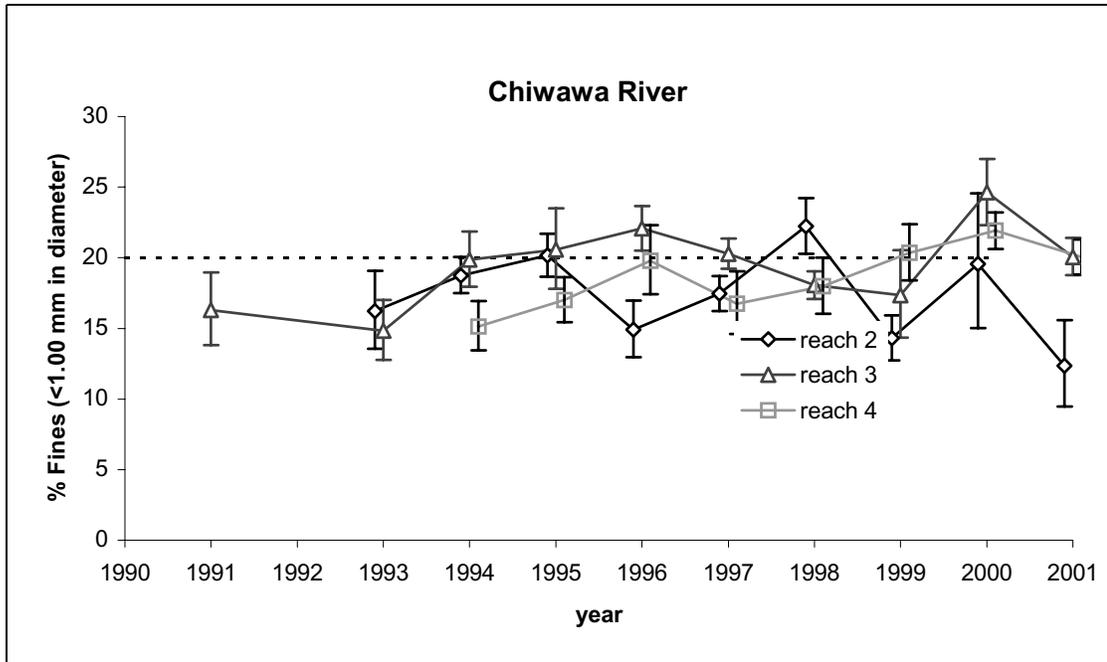
The overall trend of short term increases in fine sediment levels in the Entiat and Mad Rivers may be explained by annual weather patterns, precipitation and runoff patterns. Below normal precipitation and stream flow in 1993 and 1994 led to accumulation of fine sediment due to lack of flushing flows those years. Above average snow packs and runoff during the years 1995-1997, and 1999 transported fine sediment out of the upper three Entiat reaches and the Mad River after the 1994 Tye Fire. In 1999, Entiat River stream flow measured two to three times the 40-year average in August. Higher flows of longer duration tend to favor fine sediment transport rather than deposition. In 2000, Entiat River stream flow was close to "normal" (40-year mean, USGS Ardenvoir gage) except during the June peak period when fine sediment transport is expected to be greatest. The magnitude of peak stream flow during 2001 was 50 percent lower than the 43-year average as depicted in the 2001 hydrograph.

Leavenworth and Lake Wenatchee Ranger Districts

Chiwawa River:

Percent fines in all three reaches are close to, or have exceeded, the forest plan standard of 20% at some point in the last seven years. Fine levels during 2001 decreased in all sampled reaches. After the decrease in fine sediment found in 2001, future activities in the watershed should continue to be carefully evaluated for the potential to increase the amount of fine sediment entering the river. Chinook and Steelhead spawn in the mainstem Chiwawa River. The existing levels of fines in this river are a concern, although much of the watershed is in a wilderness land allocation and road densities are low.

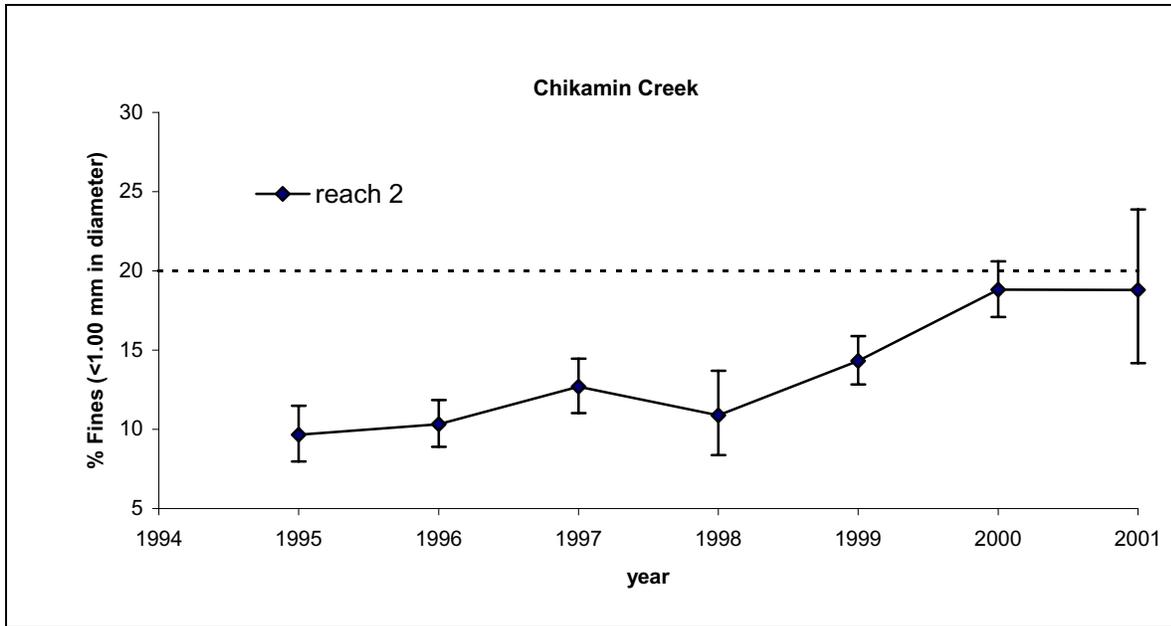
**Fines (diameter <1.00 mm) in reach 2, 3, and 4 of the Chiwawa River.
Error bars represent 80% confidence intervals**



Chikamin Creek:

In previous years the volume of fine sediment has been consistently low in Chikamin Creek (1995-1999), but 2000 and 2001 highlight a significant increase in percent fines. Causes for the increase have not yet been identified, but verification of correct the sampling site may lead to a causal factor. There has been no change in management activities that would explain the potential increase in fines. The volume of fine sediments has been consistently below the standard of 20% in Chikamin Creek for the seven years sampled (1995-2001). Chinook juveniles rear and adults spawn in the confluence area and Reach 1 of Chikamin Creek. Non-resident bull trout spawn in Chikamin Creek. Increases in fine sediment could adversely affect these populations. Increased sediment delivery to Chikamin Creek also has the potential to affect the Chiwawa River, which it flows into. The data collected over the past seven years provides a baseline against which to evaluate future effects of the Gold Ring Mine, located in the headwaters of Chikamin Creek, or the effects of other management activities such as timber harvesting on Chikamin Flat (private land).

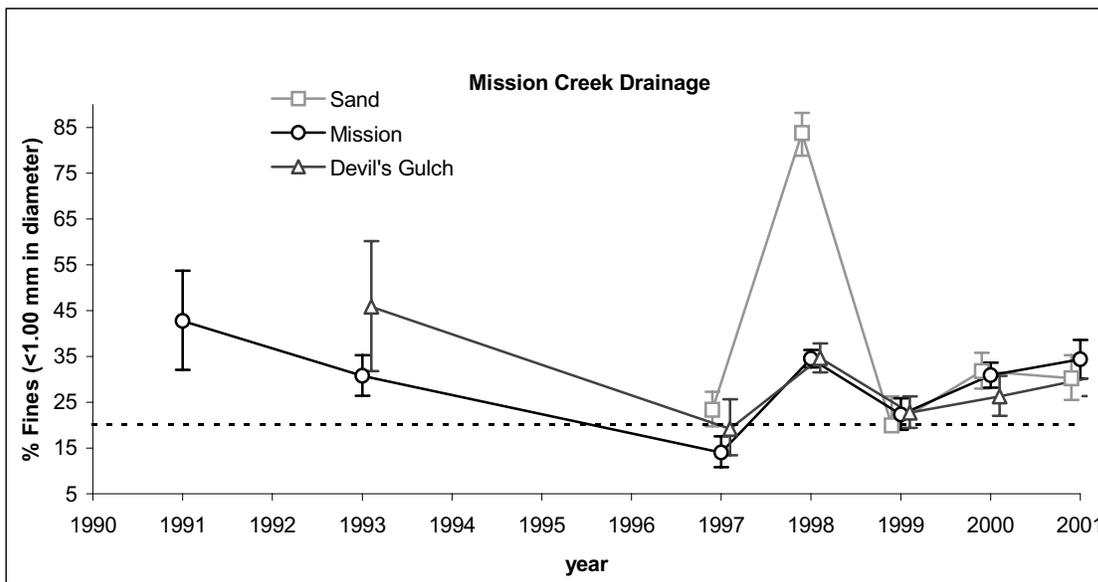
Percent fines in Chikamin Creek Reach 2 sediment samples between 1995 and 2001



Mission Creek, Devil's Gulch, and Sand Creek:

Percent fines in Mission Creek, and Devil's Gulch continued to increase in 2000 from the local minimums observed in 1999. The exception was in Sand Creek where fines decreased slightly in 2001. However, the comparison test for Sand Creek was not refined enough to determine whether there was indeed a difference between 2000 and 2001. Fine levels increased significantly from 1997 to 1998 and were well above the Forest Plan Standards in 1998. The 1998 increase likely reflects a late spring (early July) erosion event in the Mission Creek watershed.

Mission Creek, Devil's Gulch, and Sand Creek percent fines. Error bars represent the 80% confidence interval



Naches Ranger District:

A total of 128 samples were collected and processed this year by field technicians from the Yakama Nation. All of the regular sites in the Little Naches were sampled, except for Little Naches Reach 1, Riffle 3 (10 reaches, 116 samples). This particular riffle was skipped this sampling season due to spring Chinook spawning activity. Four redds had already been constructed in the riffle and live fish were present when sampling was planned. The continued sampling effort in the Little Naches extends our knowledge of trends and conditions in spawning habitat. With this year's monitoring work, the data set for the Little Naches drainage now covers a time period of 17 years for the historical reaches and 10 years for the expanded sampling area. One reach (12 samples) on the South Fork Tieton River was sampled again this past season by US Forest Service employees to provide further information on bull trout spawning conditions and now spans three years. The South Fork Tieton samples were collected in the vicinity of Minnie Meadows.

The overall average fine sediment levels in the Little Naches this year (2001) were somewhat higher than the previous year (2000), but comparable to the monitoring results from 1995-1999. The overall level of fine sediment in spawning gravels has been fairly uniform for the past few years, after declines in the middle 1990's. The monitoring results seem to indicate that past improvements to roads, trails, and other land practices initially curtailed fine sediment delivery, but now a constant level of fine sediment contribution is being maintained. The current fine sediment conditions are still higher than those found in the earliest years of monitoring. All potential sediment sources should be assessed, quantified and addressed. In particular, dispersed camping and recreational activities near streams appear to be increasing and their role in sediment contribution needs to be evaluated.

Fine sediment rates in the South Fork Tieton reach continue to be elevated in comparison to the results from 1999. The reach average for fines less than 0.85 mm were similar to those found in 2000, and approximately 50 percent greater than 1999 (8.9% in 1999, 12.9% in 2000, and 12.9 in 2001). An explanation for the pronounced change since 2000 is as yet unknown. Recent livestock enclosures were expected to help remedy this situation. Camping and other recreational activity also occurs in this area.

Stream Temperature:

The Forest Plan Standard and Guidelines for temperature in Class I, II and III streams are: a) the maximum temperature will be less than or equal to 61 degrees Fahrenheit on any day and/or the average 7-day maximum temperature will be less than or equal to 58 degrees Fahrenheit; b) where streams naturally exceed the above standards, management activities will not cause further measurable temperature increase.

During the 2001 monitoring season, the region was experiencing one of the lowest water years on record. Consequently, most streams were experiencing low flows for longer periods of time when compared to an average year.

Leavenworth and Lake Wenatchee Ranger Districts:

Summer stream temperature was monitored at 42 sites during 2001 on the Leavenworth and Lake Wenatchee Ranger Districts. Air temperatures were monitored at 8 of these sites. Streams were chosen to reflect various amounts of management within watersheds (timber harvest, roads, etc.) and suspected natural temperature fluctuations. Twenty-three of the streams monitored exceeded daily maximum temperature standards at some point during the monitoring period. Of monitored streams

on the Lake Wenatchee District, the lower most reaches of the Chiwawa River, Rock Creek, all the Little Wenatchee sites with the exception of sites Rainy Creek (LW #) 4, Chikamin Creek and of course, Nason Creek sites exceeded this standard. On the Leavenworth District, all sites with the exception of Chiwaukum Creek, exceeded this standard. Thirty-two of the streams monitored exceeded the maximum temperature 7-day average standard. On the Lake Wenatchee District, sites not exceeding this standard include: Beaver Creek North Fork; Minnow Creek; Marble Creek; Chiwawa River #4; and Phelps Creek. On the Leavenworth District, all sites exceeded the standard. A Water Quality Restoration Report (WQRP) for the Chiwawa and Little Wenatchee Rivers and Nason Creek was also generated using stream temperature data in conjunction with FLIR information.

The use of the stream water temperature model known as SSTEMP allowed the analysis of current and potential water temperature on a reach basis for comparable fifth field watersheds. Designated stream reaches that had similar stream channel characteristics were used in the model application. A list of restoration efforts and desired future conditions was gathered. Individual reaches were compared to a reach with similar model variables in another watershed, and then the SSTEMP model was rerun with input variables that would represent a desired future watershed condition. The effects on the stream reach and on the entire system as a whole are evaluated and applied to the statements of current condition and desired future condition for key stream channel attributes. The attainment of these desired future conditions is linked to the current and potential water temperature regimes. Model reruns with anticipated changes in stream characteristics from completed watershed restoration showed a potential reduction in maximum water temperature of 4.4 and 5.6°F and in mean temperature of 1.5 and 2.4°F from the current condition model output for the Little Wenatchee and Nason Creek. Further study is needed to fully understand current and potential water temperature fluctuations.

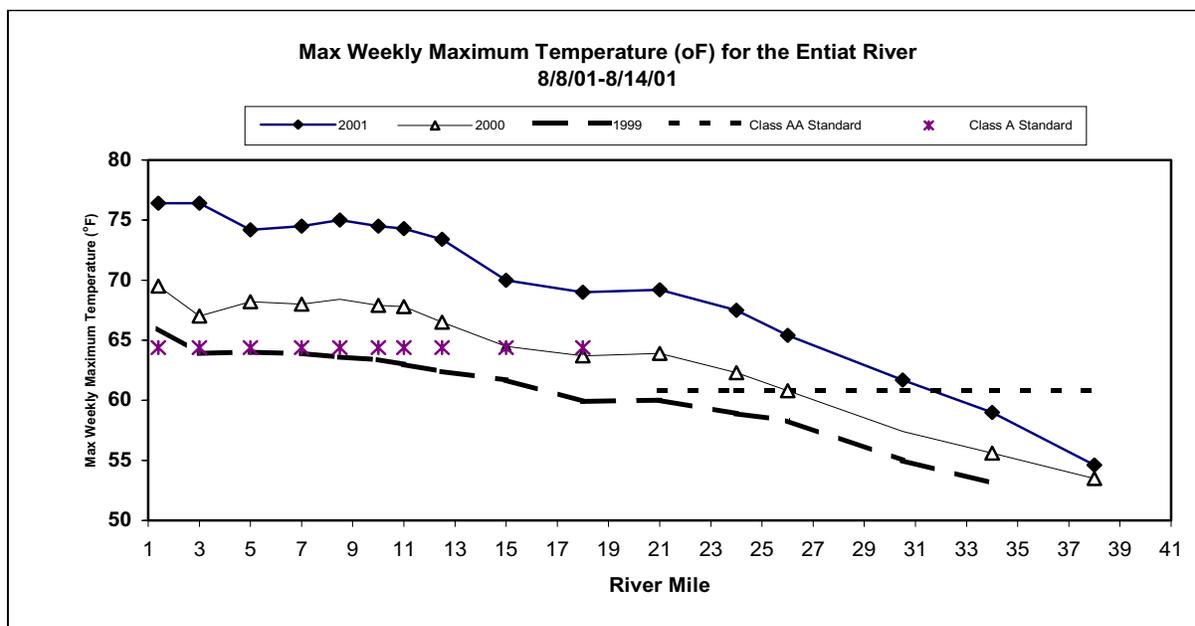
Entiat and Chelan Ranger Districts:

A total of 8904 stream-days of water temperature monitoring were accomplished in 2001 compared with 6137 stream-days in 2000. Data from the US Fish and Wildlife Service Entiat Hatchery location contributed an additional 244 stream-days to our temperature monitoring database, for a total of 9148 stream-days of monitoring completed in 2001. The Forest Plan Standard specified maximum of 61°F on any day was exceeded on 892 stream-days in the following Entiat and Chelan subbasin waters/dates. The Forest Plan Standard average 7-day maximum temperature of 58°F was exceeded on 1479 stream-days in the Entiat and Chelan subbasin waters.

The highest recorded stream temperatures on the Entiat Ranger District occurred during the week of August 11-16, and consisted of the following: 75.5°F in Swakane Canyon Creek; 69.7°F in Potato Creek; 69.2°F in Mills Canyon Creek; 70.1°F in lower Roaring Creek; 70.1°F in the lower Mad River near Tillicum Creek; and 76.4°F in the Entiat River (RM 3.2). The highest recorded temperatures on the Chelan Ranger District were: 61.2°F in Mitchell Creek and 63.4°F in lower Twentyfive-mile Creek.

Monitoring locations in the Entiat River from River Miles (RM) 1.4 to 20 are in Class A rather than Class AA waters. At these locations, Class A water quality standards established by the Washington State Department of Ecology are applicable rather than the Forest Plan Standards. Maximum daily stream temperatures of > 64.4°F (18°C) are considered to be in exceedence for Class A waters. This standard was exceeded on 498 stream-days in 2001.

Entiat River longitudinal temperature profile (RM 1-38) 1999, 2000 and 2001.



Naches Ranger District:

Stream temperature monitoring continued this season on the American, Bumping, Little Naches, Tieton and Rattlesnake drainages. During the summer of 2001, a total of 44 stream temperature sites were monitored. At 14 of these sites, air temperatures were also monitored. Many of these sites were a continuation of the monitoring started in 1998 as part of the cooperative project with the EPA and include longitudinal profiles on the Little Naches, American and Bumping Rivers. In summary, the summer of 2001 can be characterized as one with well below average stream flows and average air temperatures resulting generally in above average stream temperatures.

Cle Elum Ranger District:

During the summer of 2001 a total of 30 stream temperature sites were monitored within the Yakima, Cle Elum, Teanaway, Swauk and Taneum-Manastash watersheds. A total of 2388 stream-days of water temperature monitoring were accomplished in 2001. Of those 2388 stream-days, the Forest maximum daily water temperature standard was exceeded 627 days. The Forest maximum seven-day average was exceeded 983 days.

Lake surveys:

Lakes have been monitored from 1989-2000 for riparian condition, water chemistry, phytoplankton and zooplankton, fish species, age, and condition. Water chemistry data have been supplied to the Forest Service's Regional Air Quality Specialist for analysis and comparison to EPA lake monitoring in the mid-1980's (contact Janice Peterson, Mount Baker - Snoqualmie National Forest, for more information). Otoliths have been supplied to Washington Department of Fish and Wildlife for age analysis (contact Ken Williams, WDFW, for more information). Riparian information has been useful for coordinating with Forest Service recreation personnel regarding concerns raised by recreational uses. Recreation personnel sometimes suggest a lake for monitoring when they suspect concerns exist.

A long-term goal of the lake monitoring effort is to use the data to assist formulation of stocking recommendations to help the Forest coordinate with state stocking programs while protecting resources, without any fish and downstream native fish populations. Other goals include monitoring

long-term changes in regional air quality through changes in lake chemistry and determining impacts of recreation use.

Stream surveys:

Periodic stream surveys of all major streams on the Wenatchee National Forest allow characterization of channel condition and function. Qualitative and quantitative data, and photo-documentation are collected. This data is combined with hydrologic surveys, geomorphic analysis, and data from related systems to a complete as possible understanding of the stream, riparian and watershed functioning. This data forms the backbone of project analysis, watershed analysis, and Endangered Species Act (ESA) consultation.

Stream surveys have been conducted following a standard Region 6 protocol since 1989 and over 1600 miles of stream have been surveyed on the Wenatchee National Forest. Streams surveyed in 2001 included Marble and Fortune Creeks, Upper Icicle, Little Naches and American Rivers. Please refer to individual survey reports for more information.

Recommendations

Continue to monitor activities in the Chiwawa River for the potential increases in the amount of fine sediment entering the river.

Continue to monitor Chickamin Creek and verify the monitoring site.

Continue to evaluate the role of dispersed camping activities and its role in sedimentation, especially in the Little Naches drainage.

Continue stream temperature monitoring.

Monitoring Item-

LONG-TERM TRENDS IN WATERSHED CONDITION

The goal is to evaluate the potential direct, indirect and cumulative effects of proposed activities on water resources. The monitoring question is:

Is watershed condition being maintained or improved?

For the past three years, a new type of instrumentation has been piloted (aquarods) on ten watersheds within the Wenatchee National Forest to record water level, water and air temperature. The instrumented watersheds are:

Watershed Name	Ranger District
Potato Creek	Entiat
Tillicum Creek	Entiat
Chikamin Creek	Lake Wenatchee
Phelps Creek	Lake Wenatchee
East Branch Mission Creek	Leavenworth
Mission Creek	Leavenworth
Swauk Creek	Cle Elum
Lion Gulch	Cle Elum
Nile Creek	Naches
Oak Creek	Naches

Specific management activities in each watershed vary, but the monitoring objective is the same; to measure long-term stream flow and water temperature regimes on representative watersheds. Chikamin and Phelps Creeks are higher elevation, high precipitation zone watersheds. Both watersheds are fairly undisturbed. Phelps Creek has a water diversion for power generation purposes for the Trinity Mine site. East Branch Mission Creek, Lion Gulch, Mission Creek, Nile Creek, Oak Creek and Swauk Creek are dry site watersheds where management emphasis is to reduce fuel loadings and understory timber stocking levels so as to reduce the risk of large-scale stand replacement fires. Both Potato Creek and Tillicum Creek were burned in the 1994 wildfires. The Tillicum site was previously an instrumented site operated by the USGS. Documenting the stream flow and water temperature regime for these watersheds will be used as an indicator of long-term watershed health and condition. Instruments are set to measure water level, water and air temperature at 30-minute intervals. Data are downloaded and reduced to average daily values.

Results:

Data are plotted on graphs for each water year. Instruments were installed in summer and fall of 1999. Data were plotted for Water Year 2001 and are now being collected for Water Year 2002. Since this is but the third year of data collection, no detailed comparison of data has been made. Plans will be considered for posting of graphs on the Forest Internet site.

Recommendations

Continue to operate instruments this year, developing stage-discharge relationships, so that water level can be equated to stream flow volume. Since this year is expected to be a low runoff water year, the data will document stream flow and water temperature regimes for drought conditions.

Monitoring Item –

FISH MANAGEMENT INDICATOR SPECIES (MIS) POPULATIONS

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

Management indicator fish species on the Wenatchee National Forest are anadromous salmonids, bull trout, and cutthroat trout. Anadromous fish are native to all subbasins on Wenatchee National Forest except the Chelan subbasin.

The native coho run from all subbasins on the Forest is now considered extinct. Coho reintroduction has begun in several areas.

Spring chinook in the Yakima basin are not federally listed; all other spring chinook on the Forest are federally listed as endangered. Steelhead in the Yakima basin are federally listed as threatened; steelhead elsewhere on the Forest are federally listed as endangered. Bull trout are federally listed as threatened throughout Wenatchee National Forest. Westslope cutthroat were petitioned for listing and are under state review.

Spring chinook salmon, steelhead trout, and bull trout are found in the Naches and Upper Yakima. Spring and summer chinook, sockeye salmon, steelhead and bull trout are found in the Entiat and Wenatchee Rivers. In addition to anadromous species, westslope cutthroat, redband trout, and lamprey are species of concern.

The Wenatchee National Forest has not been actively monitoring anadromous fish returns due to established monitoring programs at mainstem Columbia River dams, and by the Yakama Nation, Chelan County PUD, Washington Department of Fish and Wildlife, and US Fish and Wildlife Service mid-Columbia Fisheries Resource Office (MCFRO).

The Forest continues to expand its knowledge of fish distribution and abundance through snorkeling, minnow trapping, and during the course of other surveys (e.g. stream surveys, lake surveys). The Forest actively coordinates and assists other agencies with bull trout and steelhead redd surveys and the collection of genetic samples. In 2000, a cutthroat genetics study was initiated and genetic samples are collected from most major basins on the Forest. Analysis is currently being performed by the University of Montana.

Bull Trout:

Bull trout are found in all subbasins on the Wenatchee National Forest except the Chelan subbasin where they are now believed to be extirpated. The Wenatchee National Forest, the Washington Department of Fish and Wildlife and the US Fish and Wildlife Service are cooperatively monitoring bull trout redds using a standardized protocol. Surveys are conducted annually on “index” streams. Counts for a few streams began in the early 1980’s; most long-term index reaches date back to 1989. The monitoring focuses on migratory populations.

Chelan Basin:

Bull trout are believed to be extinct.

Entiat Basin:

There is a small and apparently increasing population in Mad River, with some connectivity to a very small number of bull trout in Entiat River. The population appears to have doubled in the past decade, but is of concern due to its isolation and low numbers.

Wenatchee Basin:

There appears to be connectivity among all monitored populations in the Wenatchee basin. A telemetry study of the Wenatchee basin bull trout, begun in 2000 by USFWS will provide better information. Isolated bull trout populations exist in the Wenatchee basin (Icicle watershed and Ingalls Creek) but are not monitored with redd counts. There is little information about the isolated populations in the Wenatchee basin, but it is assumed they are at risk.

Upper Yakima Basin:

Four small populations, spatially isolated from each other by dams, are known from the upper Yakima basin. All are at extreme risk due to isolation and low population size. For Kachess and Keechelus populations, there are redd counts dating back to 1984; for Cle Elum and Teanaway populations, there are only recently located redds. Wenatchee National Forest is a partner in a genetics study of Yakima bull trout.

Naches Basin:

Three or four populations occur in the Naches, two of which are isolated by dams; the remaining fish may be either a single population or two separate populations. The two isolated populations (Bumping and Tieton Reservoirs) are moderately large, but the Bumping population is not spatially diversified. Redd counts appear to be increasing in Indian and Deep Creeks, and are stable in South Fork Tieton.

Entiat Basin:

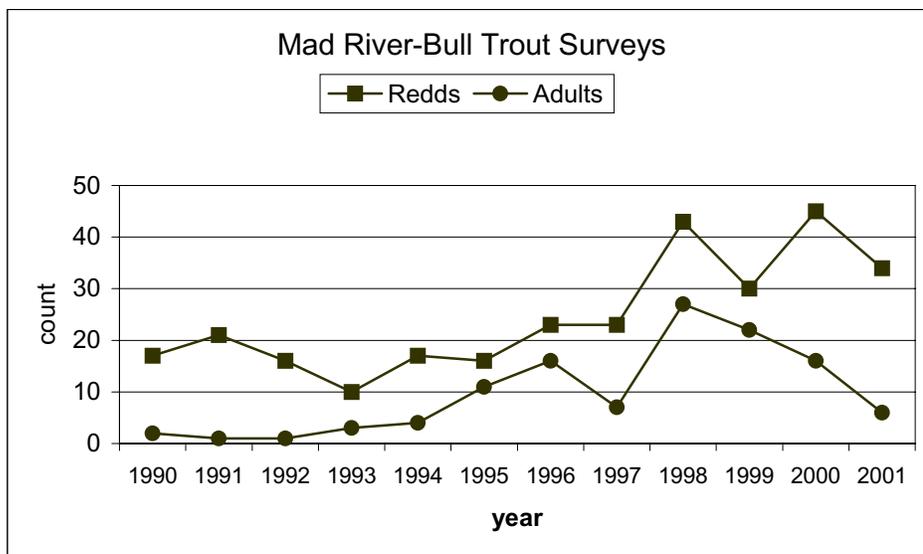
Bull trout redds and adults observed in the Mad River Index Reach 1989-2001

Year	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Mean
Redds	18	17	21	16	10	17	16	23	23	43	30	45	34	24.1
Adults	3	2	1	1	3	4	11	16	7	27	22	16	6	9.2

Distribution of bull trout redds by survey segment, 1992 to 2001

Survey Section	Length	1992	1993	1994	1995	1996	1997	1998	Avg. 92-98	1999	2000	2001
Young to Alma Cr.	2.3 mi	1	0	0	7	2	3	4	2.4	30	45	34
Alma to Berg Camp	2.9 mi	13	7	13	7	19	15	35	15.6	0	0	0
Berg to Jimmy Cr.	2.3 mi	2	3	4	2	2	5	4	3.1	0	0	0
Totals	7.5 mi	16	10	17	16	23	23	43		30	45	34

Bull trout redds and adults identified in the Mad River Index Reach 1990-2001



WENATCHEE BASIN

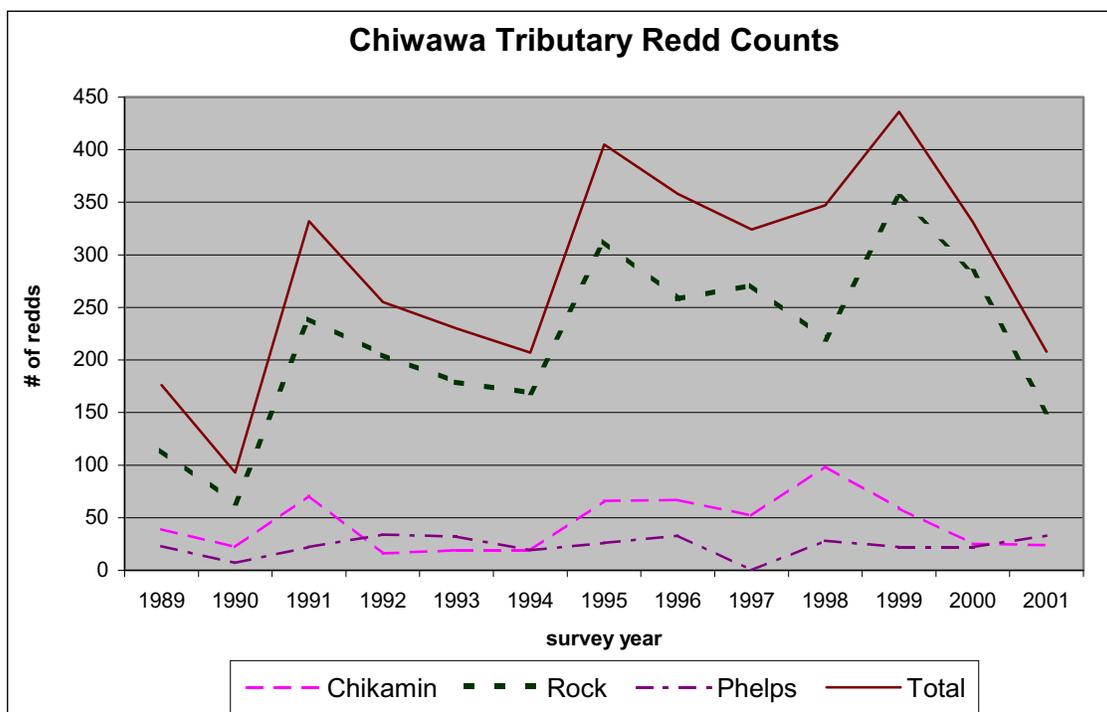
Chiwawa Watershed:

Table 5. Summary of bull trout redds on Chiwawa watershed index streams

Stream	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Chikamin Creek	39	22	71	16	19	19	66	67	52	99	59	25	24
Rock Creek	114	64	239	205	179	169	313	258	271	220	355	284	151
Phelps Creek	23	7	22	34	32	19	26	33	1*	28	22	22	33
Total	176	93	332	255	230	207	405	358	324	347	436	331	208

* Incomplete count due to high water/inaccessibility.

Redd summary for Chiwawa watershed index streams, 1989-2001.



Upper Chiwawa (non-index reach):

Numbers of redds and bull trout observed by survey date in Upper Chiwawa River, 2001

	Survey Date	Water Temp. (°F)	New Redds	Total Redds	Bull Trout Observed
Reach 1	Sept. 11	48	13 def. 8 prob.	21	7
	Sept 27	47	15 def. 2 prob.	17	14
Total				38	21

White River Watershed

Panther Creek (index stream):

A total of 11 bull trout redds were counted during four surveys of Panther Creek. This total, along with that of 1999, was the lowest complete redd count since surveys began in 1983 (Table 8). The average for the 14 completed surveys to date is 30 redds. U.S. Fish and Wildlife Service, Mid-Columbia River Fishery Resource Office (MCRFRO) is preparing a full report.

Upper White – Napeequa to Panther (non-index):

The White River was surveyed three times in 2001. Ten probable and three possible redds were identified for a count of ten redds. Redds were “probable” rather than “definite” because of uncertainty in determining if they were spring chinook or bull trout redds. In 2000, 43 redds were counted in the same White River reach. U.S. Fish and Wildlife Service, MCRFRO is preparing a full report.

Little Wenatchee Watershed

Little Wenatchee River – Hidden Creek to Falls (non-index):

The Little Wenatchee River was surveyed three times by USFWS crews between the dates of September 24, 2001 and October 11, 2001. A total of four possible redds were counted over the first two surveys and on the last survey one definite redd was identified. On the first survey, many spring chinook salmon were spawning, complicating redd identification, however, no bull trout were observed. Bull trout were not observed on any of the survey dates.

Other observations

USFS crews observed numerous bull trout (14-18 inches in size) near Two Rivers Gravel (at the temperature monitoring site – RM 1.6) on June 21 and June 22, 2001. These fish likely migrated from Lake Wenatchee to feed on sockeye salmon as they emerged from gravels. When this area was snorkeled on June 25, only four to six large bull trout were observed, along with 12-20 large whitefish, six to 12 large rainbow/steelhead, and approximately 30 large suckers. Many of the fish were of similar size to the bull trout and several large schools of fish were observed in deep areas (Barb Kelly-Ringle, personal communication).

Nason Watershed

Mill Creek (non-index):

Mill creek was surveyed three times in 2001 between the dates of September 13 and October 10. One probable and one definite redd were counted during the second survey (September 29); no new redds were counted on the first or third surveys. In previous years, counts varied from one to ten redds.

Upper Nason – from Mill Creek to Bygone Byways Interpretive Trail (non-index):

Upper Nason Creek was surveyed three times in 2001 between the dates of September 13 and October 10. Two possible redds were identified during the second survey (September 26) and one probable redd was identified on the last survey, for a total of one countable redd. Bull trout were not observed on any of the survey dates. U.S. Fish and Wildlife Service, MCRFRO is preparing a full report.

Upper Wenatchee Watershed

Chiwaukum Creek (non-index):

Redd counts and snorkel surveys were conducted between RM 0.6 and 6.7 (1993 stream survey Reaches 2 and 3) during the annual *Salvelinus confluentus* Curiosity Society meeting held at Tumwater Campground. On September 6, 20 fifty-meter units in Reach 2 (RM 0.6-3.4) were statistically sampled using methods described in the bull trout protocol (Dunham 2001). Five other units were snorkeled on August 10, and on this date only one bull trout was observed, but rainbow trout were abundant, as well as spring chinook (<200 mm) and one brook trout. A portion of Reach 2 was also surveyed for redds. During this survey, bull trout and spring chinook were actively spawning. It appeared that on this date chinook spawning was near its peak and bull trout spawning was just beginning. Due to this spawning activity, most of the definite redds enumerated were attributed to spring chinook based on redd size (six to ten foot long redds were chinook, < 5 feet long were bull trout). A redd survey was conducted over the length of Reach 3 on September 6 and a snorkel team spot sampled between RM 6.5 and 6.7, above the bull trout barrier near the confluence with South Fork Chiwaukum Creek.

Results of snorkel surveys:

In snorkel surveys between RM 0.6 and 3.4, 27 juvenile bull trout were seen. Most bull trout were 100-199 mm; the largest bull trout was approximately 300 mm and was near RM 0.6. Only one brook trout was observed in the 25 snorkel units between RM 0.6 and RM 3.4. In the spot snorkel surveys, no bull trout were observed, however, 17 brook trout were counted. The brook trout were 100-299 mm in length. On September 6, snorkelers also enumerated 390 rainbow/steelhead trout, 23 cutthroat trout, 91 juvenile coho salmon, 87 juvenile chinook salmon, and 21 unknown salmonids.

Results of redd surveys:

Eight adult bull trout (500-600 mm) were observed in Reach 3, no chinook salmon were observed. A barrier to chinook salmon is located a few hundred meters above RM 3.4; it is a combination of a six to eight-foot falls with a 20-foot long bedrock chute above. A deep (15 feet) punchbowl pool is located at the bottom of the falls.

Table 6. Results of Redd Surveys, September 6, 2001

	Survey Date	Water Temp. (°F)	New Redds	Total Redds	Bull Trout Observed
Reach 2	September 6	50-51	1 def. 4 prob.	5	0
Reach 3	September 6	47-48	1 prob.	1	8
Total				6	8

In follow-up surveys conducted by USFWS crews at later dates, four adult bull trout were observed and more redds were tallied. The final redd count (includes September 6 data) was 29 total redds (20 definite, nine probable).

At this time, we still consider the bedrock canyon area (beginning at approximate RM 6.0) to be the upper extent of bull trout in Chiwaukum Creek.

Peshastin Watershed

Ingalls Creek (non-index)

Summary of redd counts on Ingalls Creek, 2001

	Survey Date	Water Temp. (°F)	New Redds	Total Redds	Bull Trout Observed
Reach 1 (upper)	September 13	50	0	0	1 (6-8" length)
Reach 2 (lower)	September 20	50	1 def.	1	1 carcass
Total				1	1

The upper reach (Reach 1) begins at a perennial tributary that enters from the north near the center of Section 29 (T23N, R17E). No redds or large bull trout were seen. The migration barrier is located about halfway between Falls Creek and Cascade Creek, in section 25, 0.1 miles or less below a mapped (on USGS topographic map) intermittent tributary that enters from the south near the center of Section 25.

The lower reach (Reach 2) began at the trail bridge and continued up to the beginning of Reach 1. A segment of this reach was also surveyed in 2000 and the surveyor concluded that future surveys

should be conducted earlier in the spawning season (before late September) since the nature and color of the gravels makes it difficult to discern redds.

One 10-inch bull trout sampled (electroshocked) by Washington State Department of Ecology crews conducting freshwater monitoring for the Environmental Assessment Program. The fish was caught just upstream from the confluence with Falls Creek on August 1, 2001.

A large (estimated at six lbs) migratory bull trout was found dead within the screen bypass system at Peshastin Dam. WDFW personnel believe the fish was already above the dam and came through the screen site rather than migrating upstream through the bypass channel (e-mail dated October 5, 2001 from Ray Gilmour to Bob Steele, both WDFW employees).

Upper Yakima Basin

Summary of bull trout spawning surveys in the Yakima sub-basin during 2000 and 2001

Stream Index	2000	2001
Yakima River (F) Keechelus to Easton Reach	2*	1*
Ahtanum Creek (R) N.F. Ahtanum Cr. (Shellneck Cr.) M.F. Ahtanum Cr. S.F. Ahtanum Cr.	11 10* 5*	20 1* 14*
Naches River (F) Rattlesnake Cr. (Little Wildcat Cr.) American R. (Union Cr., Kettle Cr.) Crow Cr.	45 44 26	57 36 6
Rimrock Lake (AD) S.F. Tieton R. (Bear Cr.) Indian Cr.	144 226	158 117
Bumping Lake (AD) Deep Cr.	147	51
N.F. Teanaway River (F/R) NF Teanaway R./DeRoux Cr.	0*	0*
Kachess Lake (AD) Box Canyon Cr. Kachess R. (upper)	10 15	14 14
Keechelus Lake (AD) Gold Cr.	19	15
Cle Elum Lake (AD) Cle Elum R. (upper)	7*	0*

(R = Resident, F = Fluvial, F/R = Fluvial/Resident, AD = Adfluvial).

Washington Department Fish & Wildlife files, Yakima, WA.

* Incomplete survey; index area not fully defined or adequately monitored.

Redds in small tributaries (listed in parenthesis) were included in the total stream count.

NOTE: Drought conditions in 2001 affected some spawning populations more than others. Redd counts were considerably lower in Indian, Deep and Crow Creeks.

Dam counts of adult bull trout in the Upper and Mid Columbia:

Tables of bull trout passage through Rock Island and Rocky Reach Dams, 1998-2001

Rocky Reach Dam	1998	1999	2000	2001
April-June	74	84	152	160
July-October	9	9	45	34
Total	83	93	197	194

Unpublished data from 24-hour video counts of adult fish ladders at Rocky Reach and Rock Island Dams, Chelan County Public Utility District

Rock Island Dam	1998	1999	2000	2001
April-June	30	33	57	62
July-October	18	23	31	20
Total	48	56	88	82

Chelan County PUD, in cooperation with Douglas and Grant County PUDs radio-tagged a total of 39 bull trout between May 11 and July 13, 2001 (7 at Rock Island, 22 at Rocky Reach, and 10 at Wells Dam). Based on detections as of September 27, 2001, 14 of the 39 fish (36 percent) were in the Entiat subbasin. Nine of the 14 were detected in the Mad River and the other five were detected in the Entiat River.

The most recent detection results through October 5, 2001 showed 13 fish in the Entiat subbasin, 8 in the Mad River and 5 in the Entiat River. One fish left the Entiat River and was detected in the Columbia River between Rocky Reach Dam and the Wenatchee River confluence. Another fish emigrated from the Mad River to the Columbia River near Turtle Rock upstream from Rocky Reach Dam. More complete results from the bull trout telemetry study will be available with the publication of the final report in 2002.

Steelhead:

Summer steelhead populations on the Wenatchee National Forest are a mix of naturally spawning and hatchery fish. All stocks on the Wenatchee National Forest are depressed. In the Wenatchee and Yakima basins, the majority of the steelhead run is wild (naturally reproducing).

Steelhead in the Yakima basin are federally listed as threatened, and steelhead in all other basins on the Wenatchee National Forest are federally listed as endangered. Wild escapement estimates are similar for Wenatchee and Yakima basins in the past decade. Based on dam data, the total Wenatchee run (wild and hatchery) was much smaller in the 1990s than in the previous decade.

Entiat and Chelan Ranger Districts

A total of 17 steelhead redds were identified in the Mad River between River Miles 1 and 10, consisting of 15 definite redds (most with spawners present) and 2 probable redds (see Table 1 and attachment 1 for specifics). Nine steelhead adults (16 to 24 inches estimated total length) were observed on redds in the Mad River. A total of 18 steelhead redds were identified in the Entiat River between River Miles 0 and 1.5 (Keystone Bridge), and River Mile 17 to 26. These redds consisted of 16 definite redds, 1 probable redd, and 3 possible redds (see attached table for specifics). Eighteen steelhead adults (18 to 26 inches estimated total length) were observed on redds in the Entiat River.

Steelhead/Rainbow trout redd counts on the Mad River in 1997, 1999, 2000 and 2001

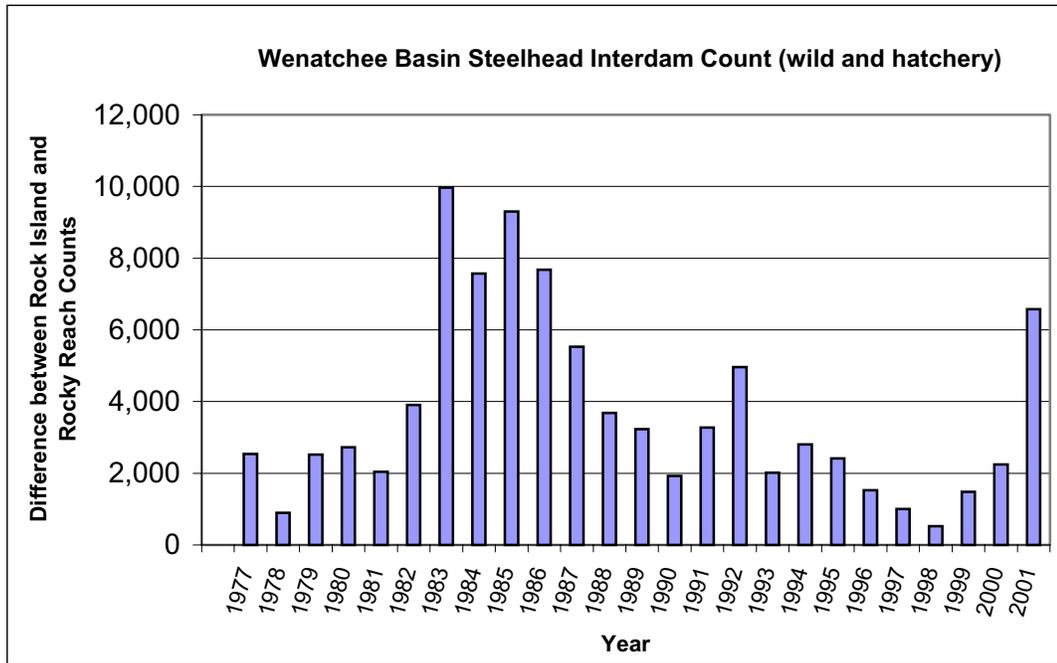
Year	1997	1998	1999	2000	2001
Definite Redds	8	No survey	0	3	15
Probable or Possible Redds	Not distinguished	No survey	3	5	2
RM surveyed	1 to 3	No survey	1 to 4	1 to 10	1 to 10

This year, for the first time in several years, rainbow/steelhead were observed spawning in Roaring Creek which joins the Entiat at RM 6.2. Rainbow/steelhead spawning in this stream has been suspected due to the large, robust population of small rainbows annually observed there in addition to anecdotal reports of historical steelhead use of Roaring Creek

No rainbow or cutthroat trout redds were observed in First Creek or Twentyfive-Mile Creek on the Chelan Ranger District. Forest biologists collected 30 apparently pure westslope cutthroat trout for allozyme analysis from Falls Creek on the North Shore of Lake Chelan on June 19, 2001. Active cutthroat spawning was observed during this sampling excursion with the following; 3 definite redds, one pair of 8-inch (estimated total length) fish present on each redd, water depths over redds ranged from .5 to 1 foot, all redds in pool tailouts with small (<12mm) gravel, surface water velocity over redds ranged from .5 to 3 feet per second, all redds about 1 foot in diameter, and water temperature of 47°F. Thirteen (43%) of the 30 fish collected were ripe and ejected either milt or eggs when gently squeezed. The sex ratio of the ripe fish was 3:1, male (77%) to female (23%).

Bill McMillan of Washington Trout sampled the Entiat River and many of its tributaries during June 2001. The following observations were recorded in his unpublished notes:

- Many cutthroat actively spawning in Tommy Creek on 6/20/01, caught 11 westslope cutthroat (4"-10"), water temp 46°F, 4035' elev.
- Saw two pairs of spawning rainbow in Silver Creek and caught two freshly spawned female rainbow (10"-11") on 6/20-21/01, upstream from FR51 crossing near Silver Falls trail
- Many rainbow actively spawning in Pope Creek on 6/20/01, caught 12 rainbow (3"-10"), lost a large (14") colorful rainbow male, all between FR51 crossing and glacial trough wall bedrock chute.



Spring Chinook:

Spring chinook in the Yakima basin are not federally listed due to the presence of other strong populations in their Ecologically Significant Unit (ESU). All other spring chinook on the Wenatchee National Forest are federally listed as endangered. All spring chinook stocks on the Wenatchee National Forest are depressed and of critical concern. These populations oscillate naturally. The 2001 returns are higher than the previous few years due to an oscillation peak; the runs will return to an oscillation valley in the near future, and these valleys are becoming extremely low and have continued to decline over the past decades. Care needs to be taken to make sure that no management action has a negative impact on the elements of fine sediment, temperature and habitat complexity on chinook habitat. In 1998, 407 wild adult spring chinook were collected at Rosa Dam for Cle Elum hatchery brood stock. This likely contributes to the sharp drop in upper Yakima spring chinook redds in 1998.

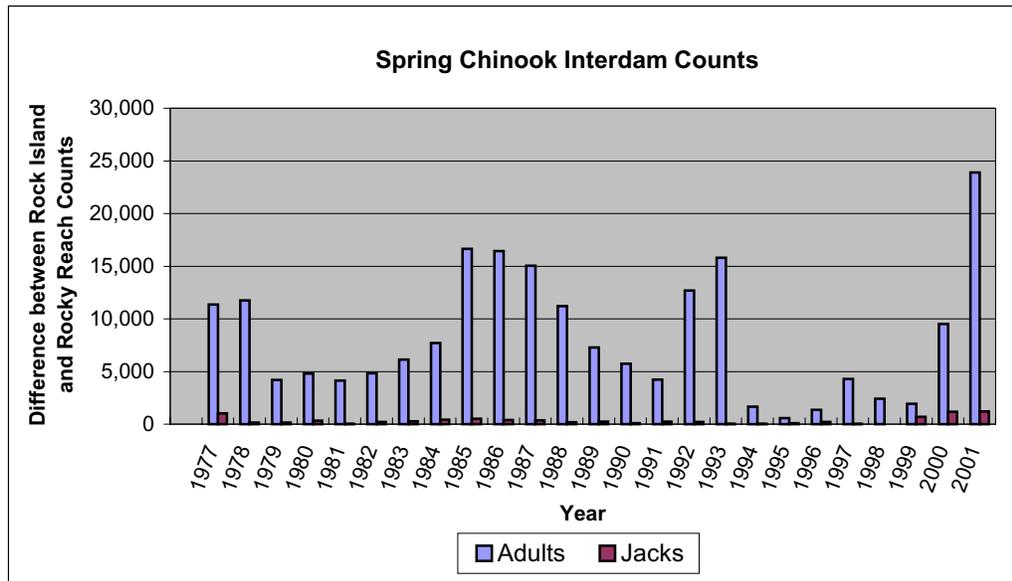
Spring Chinook Redd Counts, WNF Subbasins

Year	Naches subbasin	Upper Yakima subbasin	Wenatchee subbasin	Entiat subbasin
1981	172	2924		
1982	54	573		
1983	83	360		
1984	220	634	623	
1985	427	951	998	
1986	1313	1793	636	
1987	677	1043	801	
1988	490	443	696	
1989	541	968	637	
1990	464	773	496	83
1991	460	630	291	32
1992	425	1246	528	42
1993	554	656	589	100
1994	272	290	140	24
1995	104	117	32	1
1996	184	814	84	8
1997	339	420	208	20
1998	330	148	94	24
1999	186	224	54	27
2000	887	3836		
2001			2109	202

Surveys on the Wenatchee River Basin, 2001 Wenatchee data from: Mosey and Murphy, Spring and Summer Chinook Spawning Ground; Chelan Co. PUD.

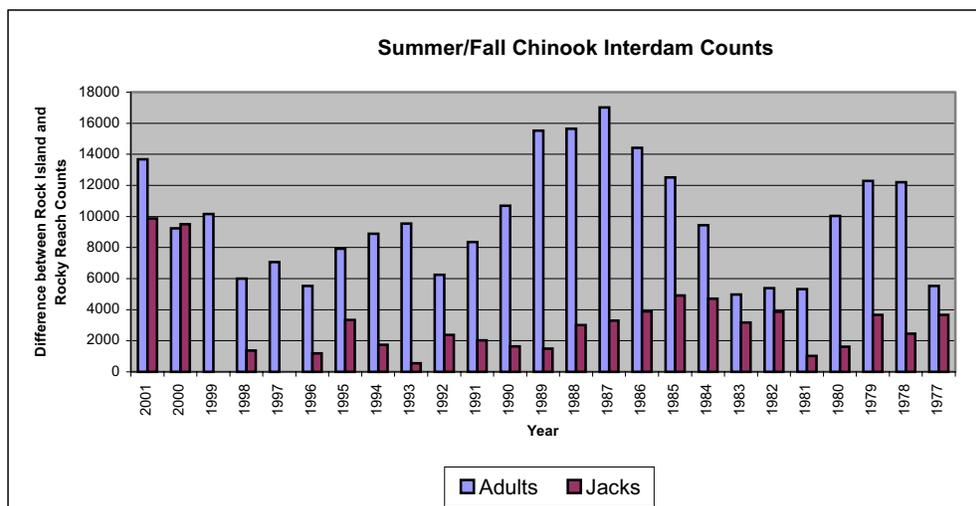
Entiat data from Dave Carie, Mid-Columbia FRO, USFWS.

Yakima and Naches data from Lee Carlson, Yakama Indian Nation



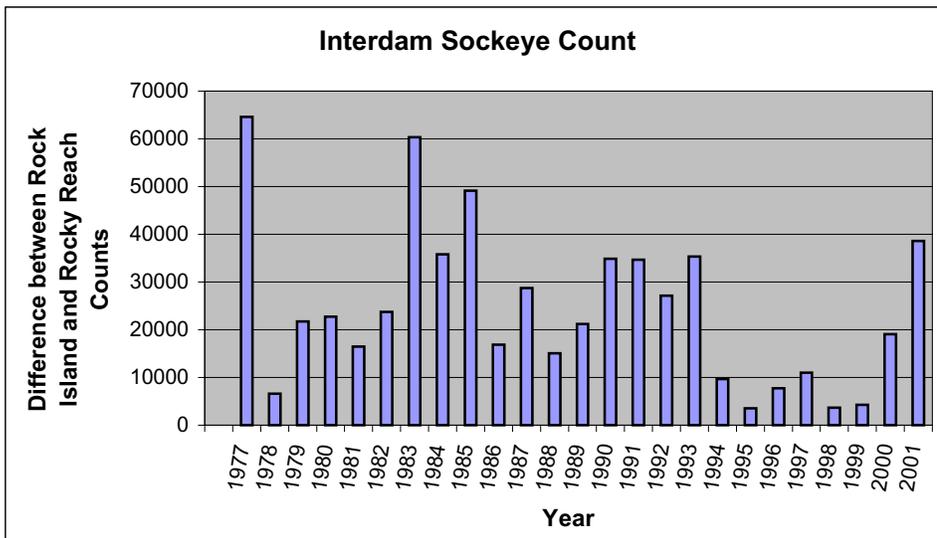
Summer/Fall Chinook:

Naturally spawning summer chinook salmon are found in the Entiat and Wenatchee subbasins. It has been suggested that summer chinook may not have been native to the Entiat River system, but that the existing run may be an artifact of past hatchery outplants as part of the Grand Coulee Fish Maintenance Project. Regardless, they are part of the Upper Columbia summer/fall chinook population.



Sockeye:

The Wenatchee River supports one of the last two viable sockeye salmon populations in the Columbia River. Annual returns to the Wenatchee can be highly variable, possibly reflecting ocean conditions, but have dropped sharply in the last 6 years. Typical values (inter-quartile range) for sockeye returns for the last 22 years range from 11,000 - 35,000. However, in the last 6 years returns have ranged 3,500-11,000. Most of the spawning for this sockeye run occurs on private land where development pressures are increasing. Ocean conditions may be a major factor in the observed sockeye population fluctuations.



Recommendations

Continue to ensure that no management action has a negative impact on the elements of fine sediment, temperature and habitat complexity on chinook habitat.

Monitoring Item –

AQUATIC HABITAT OBJECTIVES

The monitoring question is:

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

Surveys and analysis of data is ongoing and will be used in the *Forest Plan* Revision.

Monitoring Item –

AQUATIC ECOSYSTEMS

Is the ecological health of the aquatic ecosystems recovering or sufficiently maintained to support stable and well-distributed populations of fish species and stocks?

Surveys and analysis of data is ongoing and will be used in the *Forest Plan* Revision.

K. RANGE MANAGEMENT AND RELATED ACTIVITIES

Monitoring Item-

FORAGE UTILIZATION

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

Are the forage utilization levels consistent with goals for riparian and upland areas?

The Forest currently has 24 active allotments. Of these allotments, 4 are currently vacant. There has been a gradual decline in active allotments in the last few years. The decline of active allotments is related to the decline of timber harvest and the associated grazing of timber plantations, and permittee retirements. There are 14 inactive allotments that will need to be closed during *Forest Plan* revision. These inactive allotments no longer provide adequate forage and are no longer suitable for grazing.

Most of the decline in livestock numbers is associated with cow/calf pairs. In the last few years cow/pair operations have declined approximately 65 percent and in the last 10 years, almost 90 percent. Most of the grazing that is currently taking place on the Wenatchee National Forest is associated with permitted sheep operations.

According to 2000 range reports, these active allotments contain approximately 378,990 acres; and of these acres, approximately 129,192 acres are suitable for grazing. 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, result in less forage.

The result 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.

In the 2001 grazing season, all the allotments were inspected at least once during the grazing season. Allotments with resource concerns were visited on a reoccurring basis. Approximately 50 percent of the utilization monitoring transects exceeded the *Forest Plan* Standards. The remaining 40 percent were either at *Forest Plan* Standards or well below the standard. Administrative actions were taken when grazing utilization standards were exceeded.

Listed below are the administration actions taken with the grazing permittees to gain compliance with utilization standards:

- Completed pasture fencing to protect riparian areas.
- Removed livestock early from allotments to protect riparian areas and forage vigor.
- Closed pastures to grazing to help watershed and range recovery.
- Issued new grazing permits with reduced permitted livestock.
- Constructed improvements to help improve livestock distribution.
- Changed sheep routing and bedding practices.
- Monitored operations that were in non-compliance in previous years more frequently.

Utilization records have indicated that elk grazing is increasing on the Cle Elum and Naches Ranger District. Monitoring transects indicate that 10 percent to almost 70 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.

In 1998, all grazing allotments were assessed for effects on chinook, steelhead, bull trout, and cutthroat trout, in consultation with USFWS and NMFS. Of the grazing allotments on the Forest, four were not assessed due to vacant status. Nineteen allotments were determined to have “No Effect” on these species. Four allotments (Rainy-Jove, Potato, Tieton, and Swauk) were determined to have a “May Affect, Not Likely to Adversely Affect” effect. These four allotments were monitored for one to two additional years to gather more information on effects and annual operating plans were adjusted to resolve grazing concerns. After monitoring in the 2001 season, grazing strategies were either adjusted or monitoring results indicated that effects to listed species was a “No Effect”.

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 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. This plan will be completed in FY2003.

In FY2001, NEPA analysis was initiated on the Manastash Allotment Cluster (Nile, Naches, Rattlesnake, and Manastash cluster) to update allotment management plans. The analysis is expected to be completed and a decision reached in the 2003 grazing season. This project will update grazing strategies and coordinate them with current resource concerns. With the completion of this cluster, most of the sheep allotments will have been updated to meet current resource concerns.

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 ranges

Develop a plan to resolve livestock/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 CONSTRUCTION/RECONSTRUCTION

The goal is to ensure that the transportation system is being constructed and reconstructed to serve the planned resource management objectives at the assumed annual rates.

Roads are to be designed as safe and durable structures suitable for their intended uses. Within the Riparian-Aquatic Habitat Protection Zone, there are 11 Management Practices intended to minimize the number of roads and their impacts. The “Threshold of Variability” for the road miles is 25 percent of the annual *Forest Plan* projections and 10 percent for the decade. Additional Standards and Guidelines are contained in the *Northwest Forest Plan*.

	Unit of Measure	FY 2001 Actual
Forest Road Program		
Construction Miles	2	0.0
Reconstruction Miles	16	1.5
Timber Purchaser		
Construction Miles	80	0.0
Reconstruction Miles	3	1.2

The *Northwest Forest Plan* requires monitoring of: 1) net increase of roads in Key Watersheds, and 2) new roads in roadless areas. There was no net increase of roads in key watersheds and no new roads were built in roadless areas.

The estimated average annual output for arterial and collector road construction and reconstruction is 18 miles per year. The actual accomplishment for FY2001 was 1.5 miles. This is outside of the 25 percent annual “Threshold of Variability”. The original estimates were based upon the amount of historical funding available for this purpose.

Timber Purchaser:

The estimated average annual output for Timber Purchaser Road Construction is 83 miles. The actual accomplishment for FY2001 was 1.2 miles. The amount of road construction and reconstruction by Timber Purchasers is entirely dependent upon the amount and location of the timber contracted for harvesting. The assumption that this system will be completed in the first 18 years of the *Forest Plan* is not valid.

Recommendations:

Continue monitoring as scheduled.

Monitoring indicates management objectives of the original *Forest Plan* are not being achieved. The revision of these estimates will be addressed in the *Forest Plan* revision.

Monitoring Item-
ROAD MAINTENANCE

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

Unit of Measure	Forest Plan Decade Average	FY 2001 Actual
Roads Maintained for: Passenger Cars Miles & High Clearance Vehicles Miles	4233	4204

The Wenatchee National Forest continues to experience the effects of the loss of maintenance performed and/or paid for by timber purchasers. 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, 69 percent of the roads were not maintained to full road management objectives.

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 those roads no longer necessary where appropriate.

Monitoring Item-
ROADS CLOSED/OBLITERATED

The goal is to determine how much of the transportation system is no longer needed for management activities. Short and long-term needs are to be considered. Roads can be closed and placed in Maintenance Level 1 or obliterated (decommissioned) and removed from the transportation system inventory.

The *Forest Plan* Standard state that unless a resource need is documented in a project analysis, roads currently open will remain open and newly constructed roads will be closed to public vehicle access.

Unit of Measure	Forest Plan Decade Average	FY 2001 Actual
Roads Closed Total System Miles	1703	1303
Roads Obliterated Miles	NA	0

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. From 1995 to 2001, the effects of the reduced timber program combined with the aftermath of the large wildfires on the northern portion of the Forest continued to impact the transportation system. An increase in our total road miles was discovered through the process of converting our road inventories into centralized databases and GIS. In 1995

we reported a total of 5,090 total system miles, while our FY 2001 annual road accomplishment report listed 5,507 total miles. It is believed most, if not all of this increase in miles was due to re-opening of old roads (which had previously been removed from the system) to manage the large areas impacted from wildfire.

In 1999 and 2000, the Forest Service began a national effort to determine the backlog of deferred maintenance on the road system. When this was completed on the Wenatchee National Forest, it was determined that the Forest needed approximately \$62 million to eliminate its deferred road maintenance.

A new national roads management policy requires that a science based Roads Analysis be completed to determine an appropriate balance between the benefits of access and the costs of road associated effects to the ecosystem. This analysis needs to be completed at both the forest and watershed scale to provide a road system that is safe, responsive to public needs, environmentally sound, affordable, and efficient to manage.

Recommendations:

Further evaluation; additional yearly information is needed. Due to the uncertainty about the future, it would be premature to make new assumptions for the purposes of estimating outputs.

M. INSECT AND DISEASE

Monitoring Item-

INSECT AND DISEASE CONTROL

The goal is to assure that management practices do not contribute to increases in the incidence of destructive insects and diseases, such as western spruce budworm, tussock moth, pine beetles, dwarf mistletoes, root rots, and others. The monitoring question is:

Are destructive insect and disease organisms remaining below potentially damaging levels following management activities?

A survey was conducted during the summer of 2001 by the Forest Insect and Disease (FID) staff of the Pacific Northwest Region, in cooperation with the Washington Department of Natural Resources. Copies of the survey maps were given to the Forest and each ranger district.

The survey was conducted from airplanes, and represents current insect conditions across the forested landscapes of the WNF. The aerial survey, supplemented with other observations, indicates that insect and disease levels changed in 2001 from 2000.

Defoliation caused by the western spruce budworm was mapped on 134,000 acres on the Naches Ranger District. Area defoliated decreased 30,000 acres from 2000. The population will be monitored; there are no plans to do any suppression action in 2002.

No defoliation attributable to Douglas-fir tussock moth was observed in 2001.

Bark beetle activity increased in 2001 compared to 2000. A substantial increase in acres of lodgepole pines affected by mountain pine beetles was observed in 2001. Fir engraver activity was recorded on 2,400 acres of the WNF, compared to 700 acres in 2000. The increase in acres affected beetle activity is a reflection of droughty conditions.

The Wenatchee National Forest's *Strategy For Management of Dry Forest Vegetation* has management objectives for protecting, maintaining, or enhancing forest health on dry forests is to reduce susceptibility to insects and disease occurrence outside of endemic levels.

Options for achieving management objectives related to insect and disease are to thin to reduce adjacency of potential brood trees, to reduce spread potential of disease, and to increase tree resistance to insect and disease and to favor insect-disease resistant tree species.

Recommendations

Incorporate options for achieving management objectives as identified in the "Strategy for management of dry forest vegetation on the Wenatchee National Forest".

Fiscal Year 1999 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

N. FOREST FIRE PROTECTION

Monitoring Item –

FOREST FIRE PROTECTION

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

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

Are costs of protection in line with those projected by the National Fire Management Analysis System?

The Forest experienced a total of 107 fire starts; this number is below the average of 120. However, the 72,000 acres burned, was above average. Wenatchee National Forest employees supported fire suppression efforts in Region 6 as well as other regions in the National Forest system, with the first assignment occurring in April. Additionally, Forest personnel supported prescribed burning fuel treatment operations in Regions 3 and 8.

The first statistical fire of the season occurred on April 1st. Large fire activity became steady in July and remained such through September. Lightning storms and human activity on July 12th and 29th resulted in two fires greater than 100 acres. Dog Creek fire on the Naches Ranger District burned 550 acres, and Union Valley Fire on the Chelan Ranger District burned 4,930 acres. Lightning storm activity on August 12th resulted in five large fires that required Incident Management Teams. All fires greater than 100 acres during the 2001 season are identified below; lightning was the cause of all fires except Union Valley:

Fires Greater than 100 Acres on the WNF

Date	Fire Name	Ranger District	Acres	Fire Type
7/12/2001	Dog Creek	Naches	550	2
7/29/2001	Union Valley	Chelan	4,930	2
8/12/2001	Trout	Leavenworth	185	1
8/12/2001	Johnny/Jay	Leavenworth	327	1
8/12/2001	Fourth of July	Leavenworth	6,941	1
8/12/2001	Rex Creek	Chelan	54,298	1 & 2
8/12/2001	Spruce Dome	Naches	2,720	2
8/14/2001	Glory	Chelan	1,000	2
9/16/2001	Tommy Creek	Entiat	646	2

For the year 2001, the Forest had 107 fires or 89 percent of the 10-year average. Lightning accounted for 54 fire starts and the remaining 53 fire starts were human caused. The Forest was funded and staffed at the Most Efficient Level of protection. This level of funding enhanced the Forest's initial attack and large incident Type II crew support.

Emphasis was placed on developing and maintaining interagency programs to improve the efficiency of the Fire Management Program. The Forest continued to participate in the Central Washington Interagency Communication Center (CWICC), to staff fire suppression crews and engines, to participate in the Eastern Washington Wildland Fire Coordinating Group, and to develop Incident Management Teams in partnership with the State of Washington Department of Natural Resources and other federal agencies. Enhancement of interagency efforts in Okanogan County continued to be an emphasis item, during the second year of the administratively combined Okanogan and Wenatchee National Forests.

The Wenatchee National Forest hosted national and regional fire suppression resources. These included a National Interagency Hotshot Crew stationed on the Entiat Ranger District. The Wenatchee National Forest also hosted national, regional, and forest helicopter programs. These were a National Type II Helicopter for large incident support, a Regional Rappel Crew with Type III Helicopter and a Forest Type III Helicopter. All helicopter aircraft and crews were based at Pangborn Airport. The completion of the modern-era Moses Lake Air Tanker Base facility resulted in the closure of the Pangborn Air Tanker Base, which had been in service since 1961.

In FY2001, the Forest emphasized safety both in training and daily work activities. Managers organized for the fire season by providing advanced training and encouraging employees to participate on Type I and Type II Incident Management Teams. All employees available for fire suppression attended a firefighter safety refresher, including a practice shelter deployment, and took the work capacity fitness-test. New employees attended Interagency Firefighter Training at either West Valley High School in Yakima, or Entiat High School in Entiat. The Fire Staff emphasized safety to all initial attack personnel at the annual fire preparedness reviews.

In concert with the fire suppression program, the Forest continued to emphasize fire detection and prevention as important components of the Fire Management Program. During a period of very high fire danger from July through September, the Forest hosted a National Fire Prevention Team. During this period, most of the Wenatchee National Forest was closed to campfire use. The Fire Prevention Team provided advanced on-the-job prevention training to four forests employees. Districts provided extra fire prevention personnel to make field contacts. At the same time, additional fire severity suppression personnel were stationed on the forest.

On July 10th, four firefighters from the Naches Ranger District, Wenatchee National Forest, lost their lives after becoming entrapped in the Thirty Mile Fire on the Okanogan National Forest. Numerous Forest employees participated in the subsequent investigations, as well as the memorial service held in Yakima, Washington.

Recommendations

Continue to monitor the effectiveness of the fire protection and prevention programs.

Fiscal Year 2000 Recommendations

Last year's recommendation was to continue monitoring as scheduled; monitoring continued.

Monitoring Item –

USE OF PRESCRIBED FIRE

The goal is to provide appropriate, efficient application of prescribed fire in support of the Forest Management Program. The monitoring questions are:

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

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

The use of fire as a tool to manage unwanted vegetation and debris, to prepare areas for tree planting, and to improve wildlife habitat continued to be a significant portion of the fire program. During FY2001, 3479 acres were treated with prescribed fire and 509 acres had mechanical treatments of natural and activity fuels.

The Wenatchee National Forest continued to develop and implement the Dry Site Strategy, which allows managers to implement fuel reduction and vegetation management activities on a large acreage scale that will decrease the possibility of high intensity fires.

The Forest successfully implemented prescribed burns that met resource management objectives and reduced fuel loadings. However, today's increased awareness about the dry forest ecosystem, which includes fuel loadings and stand densities in excess of historic conditions, has caused the Forest to look for new management techniques which can be applied on a much larger scale than used in the past.

The Wenatchee National Forest completed Wildland Fire Use planning on all ranger districts. These plans are scheduled for approval by the Regional Forester in early 2002 with implementation to follow.

Recommendations

Continue to support on-going research supporting fire as an important disturbance process in all dry site ecosystems.

Manage wildland fires within designated wildernesses for resource benefit.

Fiscal Year 2000 Recommendations

Last year's recommendation was to support on-going research supporting fires as and important disturbance process in all dry site ecosystems. Monitoring of this research has continued.

O. AIR RESOURCE MANAGEMENT – Monitoring item not evaluated this year

P. MINERALS

Monitoring Item -

MINE SITE RECLAMATION

The goal is to ensure that disturbed lands are reclaimed to a use consistent with the Rehabilitation Standards and Guidelines.

This report includes large and small historic mine sites under the Comprehensive Environmental Recovery, Cleanup and Liability Act (CERCLA) and Abandoned Mine Land (AML) programs; small scale mining activities such as one to three person underground mining; drill, backhoe and underground mineral exploration; recreational-level prospecting including panning, metal detecting, rocker box operations, and 2 to 5-inch suction dredge operations; and small tonnage sand & gravel, pit run, and building stone removals (mineral material permits and contracts). During FY2001, there were no moderate or large scale exploration or mining activities on the Forest, and there were no leaseable energy or non-energy related mineral activities.

Monitoring of CERCLA and historic AML sites and current operations during FY2001 indicates that approximately a minimum of 175 acres were in a disturbed status from mining-related activities on the Wenatchee National Forest. Most of the disturbed acres (approximately 120 acres) involve the historic Holden Mine Site. The Holden Mine is under a CERCLA remediation effort. Additional acres of disturbance involve historic AML sites across the forest. As inventories are completed and funding is made available, many of these sites will be restored. An estimated 50 acres of disturbance were the result of recent small-scale mining operations that were approved in the recent past and have activity continuing today. A small portion of these disturbed acres represents new disturbances and a small portion was satisfactorily reclaimed and met reclamation objectives. But many of the sites were not reclaimed because the operations are ongoing. Several operators have been instructed through Notices of Noncompliance to bring their operations into compliance with regulations and/or their operation plans.

Due to the lack of funding and staffing, many of the very small-scale prospecting and mining activities (e.g. recreational mining or building stone collection) were not monitored. Of those monitored, probably about 90 percent either did not require reclamation because the activity was inside an established borrow pit, or stone was picked along drainage ditches or cut slopes, or reclamation efforts were appropriate and successful. Most of the remaining ten percent have not been reclaimed because the operation is continuing.

There were 12 ongoing mining operations where the Forest Service maintained a reclamation bond. They represent surface disturbing operations of such an extent that reclamation would be required. All bonded plan of operation-level mining activities were monitored and appropriately administered. Where appropriate, bonds may be used to fund reclamation to bring the project up to standard.

The objectives in the *Forest Plan* appear to be adequate, and reclamation bonds and regulatory authority provide for compliance when the objectives are not achieved.

Recommendations

The major problem with appropriate monitoring is not the process, but the available funding and staff. Continue to request funding that would allow 100 percent monitoring of all bonded mineral related activities, as has been the case over the last several years.

If additional funding is provided, then conduct additional monitoring to ensure adequate reclamation is being completed on non-bonded operations. Where it is not being properly completed, take regulatory action to require the operator to do the required reclamation.

Fiscal Year 2000 Recommendations

Last year's recommendation were essentially the same as this year's recommendations; monitoring continued.

Monitoring Item -

MINE OPERATING PLANS

The goal is to ensure that mining notices of intent to operate and plans of operations are processed in a timely manner and administered to standard, complying with regulation, Forest Management Goals, and *Forest Plan* Standards and Guidelines.

Notices of Intent are generally processed within the fifteen-day time frame established in regulations (36 CFR 228 subpart A). Notices are processed by evaluating the described work and either returning a letter to the proponent that acknowledges the notice as sufficient or requires the submittal of a plan. Plans of operations are often not processed within the thirty plus sixty day established time frame. The primary reason is Forest Service compliance with Federal environmental laws and their implementing regulations.

Approximately 70 Notices of Intent and Plans of Operations were processed in FY2001, with a total of about 150 active plans or notices (many were multi-year activities). Of these, about 50 percent of the total operations were administered to standard. However, all of the bonded operations 12 were administered to standard. The operations that were not administered were anticipated to have such small impacts that monitoring was considered not necessary. Most of these very small activities are recreational in nature and occur briefly and/or are conducted over the weekends.

The number of new Notices of Intent and Plans of Operations that are submitted to the Forest has remained relatively constant over the previous five-year period. Recent inventories of recreational-level activities indicate that many are simply not complying with notification requirements. Notices and plans are proposals from the public to enter onto Federal lands to conduct minerals-related activities as authorized under the U.S. Mining Laws. Because these activities occur at the initiative of the public, and because they fluctuate with the economy, with mineral demand, and with mining industry and recreational interest, it is difficult to decipher a trend. Mining activities on Federal lands also fluctuate in response to the difficulties that the proponent perceives in the approval process. These difficulties may be time delays in obtaining approval to operate, limitations in access or the type of equipment that may be used, or imposition of seasonal operating periods to avoid impacts to resources. It is reasonable to conclude that *Forest Plan* Standards and Guidelines that place possibly significant limits or restrictions or delays on the operator do not promote a favorable climate for the mineral industry or the recreating public.

Recommendations

The objectives and Standards and Guidelines in the Forest Plan appear adequate, but the level of funding is inadequate to ensure total compliance. If determined to be desirable, request adequate funding that will allow monitoring of all mineral related activities.

Based upon the administration and monitoring completed, a Forest Plan adjustment is not necessary at this time.

Actively conduct programmatic resource surveys that will accommodate anticipated mineral activities. This will allow the processing of Plans of Operation in a more timely and efficient manner.

Fiscal Year 2000 Recommendations

Last year's recommendation were the same as this year's recommendations; monitoring continued.

Q. COMMUNITY EFFECTS AND RESOURCE BUDGETS -

Monitoring Item -

COMMUNITY EFFECTS

The goal is to provide local communities with a constant source of opportunity for the use of goods and services that provide for desired community growth. The Wenatchee National Forest impact area includes Chelan, Douglas, Kittitas, and Yakima Counties. The monitoring questions are:

Are payments to counties changing?

Are local populations changing?

Are local employment patterns changing?

Are life-styles, attitudes, beliefs, or values changing?

Changes in Payments to Counties

By law, 25 percent of the revenues collected by the Forest Service from the use of National Forest System lands and resources is returned to the counties as a source of funds for schools and roads. In Washington State, half of the funds (school portion) are redistributed throughout the state, while the road portion remains within the county.

Historically, the majority of the receipts have been generated by timber sales. The sharp reduction in timber sales on public lands has caused the receipts to decline dramatically. In spite of this decline, timber sales still provide the majority of receipts. Recreation fees for campgrounds also declined over the past 5 years as more Forest Service campgrounds have been converted to concessionaire operations.

Since these funds were a significant source of county revenue, they were originally included as a monitoring item in the *Forest Plan*.

In 1993, Congress passed Section 315 of the Interior and Related Agencies 1993 Appropriations Act that was designed to mitigate the economic effects associated with the listing of the northern

spotted owl. The “owl guarantee” was based on the 1986-1990 payment to counties. It declined at 3 percent each year and was to be phased out in early in this decade.

The “owl guarantee” has been superceded by passage in Congress of The Secure Rural Schools and Community Self-Determination Act of 2000 (Public Law No. 106-393). This act redefined the payments to counties as the average of the eligible state’s three highest 25-percent payments for the years from 1986-1999. This payment is derived from any revenues, fees, penalties, or miscellaneous receipts, received by the Federal Government from activities by the Forest Service on the federal lands and to the extent of any shortfall, out of any funds in the US Treasury not otherwise appropriated. The full payment amount is adjusted annually to reflect 50% of the change in the consumer price index for rural areas.

Passage of this act has effectively decoupled the value of goods and services provided by the Forest Service from payments to counties. Since payments to counties are now set by law and will not fluctuate as a result of Forest Service activities, there is no change expected in payments in the future.

Change in Local Population

The population continues to increase within the counties influenced by the Wenatchee National Forest. According to the State of Washington Office of Financial Management, growth rates in the Wenatchee National Forest impact area have dropped below state averages from 1999 to 2000. The growth rate of 1.47 percent is the lowest since the 1988-1989 comparison. For Chelan, Douglas, and Kittitas Counties, that growth rate is due primarily to in-migration into the county. For Yakima County, the growth rate is due to natural increase of births over deaths. This data reflects the 2000 and 1990 census with the intermediate years being adjusted to reflect the new population figures. As a result, these numbers are slightly different than those shown in previous monitoring reports.

Percent Annual Population Growth Rates

Area	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Chelan Co.	1.82%	2.63%	2.56%	3.57%	3.45%	2.17%	1.47%	0.48%	0.80%	1.59%
Douglas Co.	4.94%	1.45%	2.15%	2.81%	1.02%	2.70%	1.32%	1.95%	0.96%	1.77%
Kittitas Co.	2.53%	1.46%	5.04%	1.71%	1.35%	2.33%	2.27%	-0.32%	3.18%	1.35%
Yakima Co.	0.89%	1.78%	1.60%	2.59%	0.99%	1.71%	0.53%	0.86%	0.86%	1.41%
Impact Area	1.55%	1.86%	2.12%	2.69%	1.46%	1.95%	0.94%	0.78%	1.07%	1.47%
WA State	2.75%	2.33%	2.43%	1.78%	1.79%	1.60%	1.63%	1.40%	1.27%	1.76%
King County	2.32%	1.44%	1.48%	0.74%	0.88%	.94%	1.07%	0.58%	1.28%	1.46%

Estimated Total Population 1991-2000

Area	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Chelan Co.	53436	54965	56423	58319	60079	61240	62895	64199	65575	66616
Douglas Co.	27648	27423	28143	28692	29312	29967	30548	31247	32035	32603
Kittitas Co.	27203	27684	28295	28938	29791	30372	30989	31845	32916	33362
Yakima Co.	191490	198225	198225	202044	206046	209381	212375	215587	219483	222581
Impact Area	299777	305011	311086	317993	325228	330100	336807	342878	350009	355162
WA State	5000353	5091138	5188009	5291577	5396569	5483103	5579140	5685459	5792214	5894121
King County	1549991	1570997	1590603	1609529	1625241	1640249	1659106	1686266	171212	1737034

Changes in Local Employment Patterns

The State of Washington Employment Security Reports for Employment and Wages are published on a delayed basis. The employment data for 2000 are the most recent available. Covered employment in the Wenatchee Impact Area since 1990 grew 15.40 percent. This compares with a growth rate of 26.06 percent for Washington State. This is a significant change from 1990 through 1994, when the local economy grew significantly faster than the state economy. Since 1994, the growth rate for the impact area has been slower than the state economy. From 1998 to 1999 employment in the Wenatchee National Forest impact area declined by 2.95 percent, while the state grew at 1.99 percent. From 1999 to 2000, employment grew by 2.13 percent in the four counties while the state grew at 2.20 percent.

Total Covered Employment Wenatchee Impact Area

Area	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Chelan Co.	30296	30655	32166	34479	33777	33890	34714	36270	34959	36021
Douglas Co.	8303	8091	7950	8379	8259	8416	8485	8714	8757	8910
Kittitas Co.	9249	9538	10270	10772	11190	11343	12052	12280	11507	11822
Yakima Co.	81466	85919	87867	90022	89354	90481	92753	94021	92634	94243
Impact Area	129314	134203	138253	143652	142580	144130	148004	151285	146826	149940
WA State	2160883	2205665	2248245	2303539	2339727	2404623	2508962	2593426	2645008	2703237

Percent Change from Previous Year in Covered Employment

Area	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Chelan Co.	1.81	1.1	4.93	7.19	-2.04	0.33	2.43	4.48	-3.61	3.04
Douglas Co.	-0.37	-2.55	-1.74	5.4	-1.43	1.90	0.82	2.70	0.49	1.75
Kittitas Co.	1.12	3.12	7.67	4.89	3.88	1.37	6.25	1.89	-6.29	2.74
Yakima Co.	-1.50	5.47	2.27	2.45	-0.74	1.26	2.51	1.37	-1.48	1.74
Impact Area	-0.48	3.78	3.02	3.91	-0.75	1.09	2.69	2.22	-2.95	2.13
WA State	0.77	2.07	1.93	2.46	1.57	2.77	4.34	3.37	1.99	2.20

In addition to tracking total employment trends, past monitoring reports have also tracked the following sectors in the economy using Standard Industrial Classification (SIC): Manufacturing- Lumber and Wood Products, Manufacturing- Paper and Allied Products, Retail Trade-Eating and Drinking Places, Hotels and Lodging Places, and Services- Amusement and Recreation Services. These sectors were originally chosen to track the effect of Forest Service activities on these local economic sectors. In the early 1990's when the *Forest Plan* was completed, these sectors tended to be dominated by Forest Service outputs and services. Since that time, the timber output from National Forest lands has declined significantly to where outputs from public land are a minor part of the supply picture. At that time the Amusement and Recreation Services sector was dominated by the ski industry that was based on public land. This sector has significantly changed as water slides, video gaming parlors and other recreation services were counted. The Retail Trade-Eating and Drinking Places and Hotels and Lodging Places were felt to have a significant component due to National Forest users in the early 1990's. Since that time, the Wenatchee National Forest impact area has changed significantly in these sectors. Yakima County in the early 1990's was the only metropolitan area in the four counties. In 2000, the US Census Bureau classified the Wenatchee and East Wenatchee area as a metropolitan area. Metropolitan areas tend to generate more business than tourist travel for these

two sectors. In addition, throughout the four county area, there have been significant developments of tourist attractions outside of National Forest lands during the past decade. In the Wenatchee Valley, this includes a string of parks along the Columbia River, destination golf courses, and a significant expansion of tournaments for various sports bring in participants from throughout the state. The Yakima Valley has also developed these types of tourist amenities, and the Yakima Valley wine industry has become a significant draw throughout the western United States. These types of developments are also occurring in Kittitas County. The National Forest expenditures are no longer considered significant.

The National Visitor Use Monitoring of Recreation Use on the Wenatchee National Forest collected information on economic expenditures by recreational visitors. These expenditures can then be used to predict economic impact of National Forest recreation on the local economies. This is the data that will be used in the future to show the effect of visitors to the Wenatchee National Forest on local economies.

Change in Life-styles, Attitudes, Beliefs, or Values

The first half of the 1990's was characterized by heavy urban migration to rural areas. This migration was particularly heavy in those areas with outdoor recreation opportunities. In Kittitas County, there has been an influx of residents that continue to work in the Puget Sound area. It is likely that within the next 10 to 20 years, Kittitas County will become a bedroom community of the Seattle area.

The second half of the 1990's showed strong growth in western Washington, while the communities east of the Cascades lagged behind. There was some out-migration, particularly of the working age population to those urban areas. With the dramatic slowing of the economy in western Washington, it is expected that this migration pattern will be reversed.

The area is changing and becoming more urban in life-styles, attitudes, beliefs, and values. The east slope of the Cascades continues to be popular with retirees from western Washington as they move east for a better quality of life. This had led to increasing population growth, while job growth continues to trail behind. Overall, the rate of change has slowed in the past 2 years. These changes are driven by national trends and are outside the scope Forest Service programs.

Recommendations

The monitoring question, "Are payments to counties changing?" should be dropped. When the Forest Plan was signed in 1990, payments to counties were dependent on Forest activities. These payments are now made under Public Law No. 106-363 and are no longer related to outputs produced by the Wenatchee National Forest.

The monitoring question "are local employment patterns changing" should be dropped. As noted in the monitoring report, these sectors are no longer dominated by Wenatchee National Forest outputs. There is no reason to continue to track these specific sectors. As the National Visitor Use Monitoring reports for recreation economic impacts become available, they can be substituted into this section.

Monitoring item –
RESOURCE BUDGETS

The goal is to provide funding levels necessary to achieve outputs in the *Forest Plan*. The monitoring question is:

Are the budgets received adequate for achieving the objectives described in the Forest Plan?

The following table reflects the program budgets on the Wenatchee National Forest since 1991. The definitions of program areas changed from FY 1991 to FY1996, and this reflects some of the changes in funding for individual program areas.

Program Area	Fiscal Year 1991	Fiscal Year 1992	Fiscal Year 1993	Fiscal Year 1994	Fiscal Year 1995	Fiscal Year 1996	Fiscal Year 1997	Fiscal Year 1998	Fiscal Year 1999
Recreation	3,027,000	3,739,000	4,535,035	3,428,690	2,577,795	2,250,240	2,084,844	2,287,848	2,574,000
Fisheries	520,000	956,000	1,381,889	761,487	485,205	500,151	550,252	713,208	682,000
Threatened & Endangered Species	244,000	255,000	175,908	317,008	170,437	174,726	172,957	161,832	197,000
Wildlife	244,000	279,000	156,329	206,614	436,327	486,087	400,775	418,239	136,000
Range	198,000	149,000	276,630	254,533	324,608	212,983	226,124	340,907	201,000
Timber	7,944,000	7,096,000	5,423,457	5,420,986	8,612,462	7,817,329	10,569,634	7,664,036	4,712,000
Other Resource Support to Timber	973,000	1,326,000	1,077,171	709,364					
Watershed & Air	1,772,000	1,075,000	885,223	2,938,457	581,286	601,236	597,545	547,080	383,000
Minerals & Geology	188,000	161,000	240,104	203,359	327,398	290,070	269,746	394,161	332,000
Lands	1,257,000	4,347,000	4,328,440	901,096	4,006,100	366,543	1,867,012	1,067,686	554,000
Facilities & Transportation	5,005,000	6,200,000	3,999,503	3,854,485	3,192,169	2,683,177	8,316,813	3,708,386	2,598,000
Protection, State & Private Forestry	3,357,000	5,692,000	3,339,958	11,774,526*	11,762,625*	4,360,732	4,891,244	6,730,226*	6,063,000
General Administration	2,691,000	4,372,000	2,419,543	2,332,846	2,449,668	2,125,070	1,630,304	1,391,666	1,081,000
Overhead Assessments	3,111,000	3,321,000	2,764,588	2,991,427	3,264,416	3,160,177	2,965,493	3,946,661	3,526,798
Total Expenditures	30,531,000	38,968,000	31,063,778	36,094,878	39,809,950	26,117,162	34,542,743	29,371,976	22,939,780

* FY 1994 figure includes \$7.8 million for emergency fire recovery. FY 1995 figure includes \$7.7 million for emergency fire recovery. FY 1998 figure includes \$983,000 for emergency fire recovery.

The budgets reflect emergency federal action and shifts in Congressional funding (e.g. the large expenditure in Watershed and Air in 1990 reflects the cleanup and rehabilitation after the floods of 1990). The FY1994 and FY1995 budgets reflect emergency fire recovery funds as a result of the 1994 fires. The program area funding is determined at the national level by Congressional appropriation. This funding is then distributed at the Regional, Forest and Ranger District level to achieve objectives established by Congress in the budget process.

The following table gives the budget information for FY2000 and FY2001 by program area for the Okanogan and Wenatchee National Forests. The dollars shown are in thousands.

Program	BLI	2000	2001
STATE & PRIVATE FORESTRY			
State Fire Assistance	SPCF		
Forest Health, Coop Lands	SPCH		
Economic Action Programs	SPEA		4
Forest Health, Fed Lands	SPFH	362	302
Stewardship Incentives	SPIT		
Forest Legacy	SPLG		
Pacific Northwest Plan	SPNW	24	38
Forest Stewardship	SPST		
Urban/Community Forestry	SPUF		
Volunteer Fire Assistance	SPVF		
For. Resources Info & Analysis	SPIA		
International Forestry	SPIF		
Subtotal		386	344
NATIONAL FOREST SYSTEM			
Land Management Planning	NFPN	50	370
General Administration	NFGA	1,400	
Inventory and Monitoring	NFIM	944	993
Rec/Heritage/Wilderness	NFRW	2,490	3,029
Wildlife & Fisheries Habitat Mgmt	NFWF	1,510	2,022
Grazing Mgmt.	NFRG	248	255
Forest Products	NFTM	1,945	2,822
Vegetation & Watershed Mgmt	NFVW	2,592	2,201
Minerals & Geology Mgmt	NFMG	402	598
Landownership Mgmt	NFLM	1,109	570
Law Enforcement	NFLE	90	100
Subtotal		12,780	12960
WILDLAND FIRE MANAGEMENT			
Wildland Fire, Preparedness	WFPR	8,203	11,133
Hazardous Fuels Reduction	WFHF	1,334	444
Fire Operations	WFSU		
Subtotal		9,537	11,577
CAPITAL IMPROVEMENTS & MAINTENANCE			
Facilities Capital Improvs & Mtce	CMFC	1,448	1,308
Roads Capital Improvs & Mtce	CMRD	2,567	2,886
Trails Capital Improvs & Mtce	CMTL	586	750
Subtotal		4,601	4944
PERMS & TRUST FUNDS			
Brush Disposal	BDBD	519	634
Cooperative Work, Other	CWFS	323	375
Cooperative Work, KV	CWKV	1,994	1,776
Rec Fee Demo-Agency	FDAS		
Rec Fee Demo-Collection	FDCL	53	117
Rec Fee Demo-Site	FDDS	421	530
Rec Fee Collection	FEFR		11
Purchaser Elect-Timber Roads	PEPE		

Program	BLI	2000	2001
Ops & Mtce of Quarters	QMQM	172	115
Restoration of Forest Lands	RIRI		
Reforestation Trust Funds	RTRT	2,180	2,508
Timber Salvage Sales	SSSS	4,244	4,113
Rec Backlog/Timber Pipeline	TPCD		
Timber Sales/Timber Pipeline	TPPS		
Roads & Trails for States	TRTR	732	
Subtotal		10,638	10179
LAND ACQUISITION & L&WCF			
Land Acquisition Mgmt	LALW	35	36
Subtotal		35	36
OTHER			
Acquisition-Special Acts	ACAC		
Land Exchange	EXEX		
Hazardous Waste	HWHW		
Fed Highway Relief	HTER		
Fed Highway Admin. Expense	HTAE	17	
Range Betterment	RBRB	28	
Senior Citizen	NFSA/ NFSD		
Working Capital Funds	WCFE		
Subtotal		45	0
TOTAL		38,022	40,040

Recommendations

In 2000, the Okanogan and Wenatchee National Forests were administratively combined and received a combined budget. Records of expenditures are now only kept for the combined Forests. It is recommended that this item be dropped from future monitoring reports because a comparison to previous Wenatchee National Forests budgets would be meaningless.

R. GENERAL MONITORING OF STANDARDS AND GUIDELINES

Monitoring Item-

STANDARD AND GUIDELINES GENERAL

The goal is to ensure implementation and validation of *Forest Plan* Standards and Guidelines including those in the *Northwest Forest Plan*. Monitoring seeks to assure Wenatchee National Forest goals, outputs, and the desired future condition. The monitoring questions are:

Are Forest Plan Standards and Guidelines being implemented?

Are implemented Standards and Guidelines achieving the expected results?

Proposed projects are reviewed for consistency with *Forest Plan* Standards and Guidelines during the National Environmental Policy Act process. After the signing of the *Northwest Forest Plan*, training sessions were held to ensure that Wenatchee National Forest employees understood the rationale and Standards and Guidelines within the *Northwest Forest Plan*. These training sessions and reviews are done on a continuing basis.

The *Northwest Forest Plan* established an interagency monitoring program on implementation monitoring. The procedures were developed in Fiscal Year 1995. In 1996 and 1997, the Forest led an interagency team comprised of various members of the Provincial Advisory Committee in conducting monitoring of how management activities such as timber sales, roads, and restoration projects complied with the Standards and Guidelines contained in the *Northwest Forest Plan Record of Decision*. This monitoring program on the Forest documented a high level of project-level compliance. This interagency monitoring program was expanded in 1998 and 1999 to include “watershed-level” monitoring as well as “project-level” monitoring. Watershed-level monitoring is an important step beyond project-level assessments. Monitoring at this landscape scale:

- Helps fulfill the legal commitment to monitor at all scales.
- Allows management activities (projects) to be assessed in regard to achieving Northwest Forest Plan goals.
- Provides a more balanced view of the Forest’s compliance by complementing project-level reviews with an assessment of more pro-active Northwest Forest Plan requirements associated with the management of “areas” such as Key Watersheds and Late-successional Reserves. Typically, requirements associated with landscapes at the watershed scale address planning, prioritizing, and integration of activities.

Watershed monitoring was originally scheduled for The Twisp River and Mission Creek watersheds, but due to the extreme wildfire situation in the Twisp River watershed, monitoring in this watershed was cancelled. Efforts were focused on the Mission Creek watershed where past activities of fire suppression, historic logging and grazing created forest conditions that were not sustainable. The review team consisted of representatives of the USDI Fish and Wildlife Service, USDI, Environmental Protection Agency, Yakama Indian Nation, the Bureau of Indian Affairs, a representative of Longview Fibre Company, and the USDA Forest Service. The team concluded that the Forest met the intent of the *Northwest Forest Plan* in assessing, and integrating projects in this watershed.

The team then focused on monitoring the Pendleton Restoration Project within the Mission Creek watershed. This project was a commercial thinning project aimed at implementing the Forest's Drysite Strategy. The team looked at silvicultural treatments, slash disposal and burning, snag recruitment and large woody debris and how Riparian Reserve boundaries were determined. The team completed a detailed monitoring report on the project and concluded that it met the intent of the *Northwest Forest Plan*.

Recommendations

Continue Monitoring as scheduled at the watershed scale. Focus on recreation projects, especially those within the Riparian Reserves for next year's monitoring.

Support the regional interagency effort in developing effectiveness monitoring protocols which will lead to answering the question: are implemented Standards and Guidelines achieving the expected results.

S. LANDS

SUMMARY OF LANDS ACTIVITY - 2001

The Wenatchee National Forest has an active lands program. Land exchanges and land acquisitions in the past few years have resulted in significant acreage additions to the Forest. These acquired lands are managed according to the *Forest Plan* allocation held by the surrounding National Forest System lands. During the next round of Forest planning, these lands will be reevaluated, along with the surrounding National Forest Lands, to determine their final *Plan* allocation.

Land Exchanges

No Land Exchanges were completed in 2001, but there were a number of purchases and several donations as outlined below.

LANDS ACTIVITY TABLE					
	Number	Name	Price	No. of Acres	General Location
LAND EXCHANGES	NONE FOR 2001				
PURCHASES	WEN #247	Chastek	\$120,000	35.81	Near Stevens Pass along Nason Creek
	WEN #250	Trust for Public Lands	\$1,362,000	594.14	Eagle Creek Ranch on Eagle Creek
	WEN #251	Trust for Public Lands	\$7,397,000	3,790.26	Along I-90, near Lake Keechelus
	WEN #252-259	Plum Creek escrow parcels	\$8,605,997.00	4,218.18	Along I-90, upper Cle Elum Valley
Subtotal			\$17,484,997.00	8638.39	
DONATIONS	WEN #263D	Cascade Coalition Partnership		640	Along North Fork of the Tanenum River
	WEN #264D	Cascade Coalition Partnership		640	Along Taneum Ridge in headwaters of Jim Creek
Subtotal				1240	
TOTALS			\$17,484,997.00	9876.39	

IV. FOREST PLAN UPDATE

WENATCHEE FOREST PLAN AMENDMENTS

AMENDMENT	DATE	LOCATION	DESCRIPTION
Amendment 1	10/90	Forest-wide	Amendment by Secretary of Agriculture vacating ROD for Northwest Regional Guide Supplement, and returning Spotted Owl Habitat Areas (SOHAs) to the land classification of the adjacent land
Amendment 2	03/92	Forest-wide	ROD signed by Regional Forester (Region 6) for FEIS on Management of the Northern Spotted Owl in the National Forests, which directed each National Forest to insure that all management activities are consistent with the management directions adopted by the ROD.
Amendment 3	05/92	Forest-wide	General corrections and definitions made or added to the 1990 Forest Plan
Amendment 4	06/92	Sec 16 T.22N., R.11E.	Site-specific amendment for reallocation of 300 acres in the Snoqualmie Pass (Ski Acres) area from ST-1 Scenic Travel, Retention, to RE-1 Developed Recreation. This amendment was later rescinded.
Amendment 5	07/92	Sec 20 & 21 T. 28N., R. 21E.	Site-specific amendment to modify the VQO on 5 acres in the RE-3 allocation from Retention to Modification, and to allow harvest and disposal of trees for the purpose of constructing a flood control debris channel on Slide Ridge.
Amendment 5	10/92	Forest-wide	[Note: there was a duplication of amendment numbers.] Adjustments to the Activity Schedules provided in the 1990 Forest Plan.
Amendment 6	07/95	T.27N., R.19-21E. Multiple Sections	Site-specific amendment to assign allocations to lands within the Bear-Potato Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 7	07/95	Sec 27 & 35 T.25N., R.17E.	Site-specific amendment to assign allocations to lands within the Freund Recovery project area acquired by the Forest Service since publication of the Forest Plan. Lands were allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 8	07/95	Section 27 T.24N., R.17E.	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	T.24-25N., R.17E. 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 10	10/95	T.24N., R.16-17E. 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	Section 16 T.26-27N., R.19E.	Site-specific amendment to assign allocations to lands within the Tye Ridge Wild-fire 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	T.25N., R.20E. 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	T.24-25N. R.19-20E. Multiple Sections	Authorization of grazing on a temporary pasture outside an existing livestock allotment.

AMENDMENT	DATE	LOCATION	DESCRIPTION
Amendment 14	02/97	T.27N., 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 Cor- ridor)	Establishment of standards and guidelines and management direction for the Snoqualmie Pass AMA as directed by the Northwest Forest Plan amendment
Amendment 18	09/98	Section 22 T.22N., R.19E.	Site-specific amendment to assign an allocation to a parcel of land within the Sand Ecosystem Restoration project area acquired by the Forest Service since publication of the Forest Plan. The parcel was allocated to the same management prescriptions given the surrounding National Forest lands.
Amendment 19	09/98	Section 12, T.21N., R.13E. Section 36, T.22N., R.11E. Section 8, T.19N., R.13E.	Site-specific amendment to allow for wetland crossings by access road segments to private inholdings where no other options exist.
Amendment 20	09/99	Section 22, T.27N., R.17E.	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	T.18-20N. R.12-15E. 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 22	04/94	Forest-wide	Northwest Forest Plan Amendment of the Wenatchee National Forest Plan.
Amendment 23	01/01	Region-wide	"Amendments to the Survey and Manage, Protection Buffer, and Other Mitigation Measures Standards and Guideline" in documents within the range of the northern spotted owl.

LIST OF PREPARERS

Susan Carter	Forest NEPA, Appeals and Litigation Coordinator Forest Plan Appeals and Litigation
Vladimir Steblina	Forest Recreation & Wilderness Program Manager Forest Economist Recreation Trails and Wilderness Community Effects
Henry Maekawa	Forest Landscape Architect Scenery Management
Powys Gadd	Forest Archeologist Cultural Resources
Terry Lillybridge	Forest Botanist/Ecologist Sensitive Plants, Biodiversity and Old Growth
William Gaines	Forest Wildlife Biologist Wildlife
William Armes	Silviculturist Timber Offered, Harvested and Related Silvicultural Activities
Carl Davis	Forest Soil Scientist/Range Program Manager Soils, Range Management and Related Activities
Ken MacDonald	Forest Fisheries Biologist Soil, Water, Fisheries and Related Activities
Sarah Feser	Fisheries Biologist Soil, Water, Fisheries and Related Watershed Fire
Shari Miller	Fire Planning Specialist Forest Fire Protection
Tom Robison	Forest Hydrologist/Water & Air Program Manager Soil, Water, Fisheries and Related Watershed
Richard Stearns	Minerals Management Area Mineral Examiner
Steve Johnson	Lands