



United States
Department
of Agriculture



Forest
Service

Pacific
Northwest
Region

2000

Monitoring and Evaluation Report Fiscal Year 1999



Summary



Introduction



Accomplishments/Results/
Recommendations



Financial Review



Forest Plan Admendments/
Interpretation Process



Ongoing Planning Actions

Mt. Hood National Forest Land and Resource Management Plan

Monitoring Report Fiscal Year 1999

Mt. Hood National Forest
Land and Resource Management Plan

July 2000

Table of Contents

Summary	S-1
Summary of Key Resource Conditions	S-2
Chapter 1 - Introduction	1-1
Chapter 2 -Accomplishments/Results/Recommendations	2-1
Monitoring Elements:	
Fire Management	2-1
Air Quality	2-7
Soil Resources	2-11
Range Management	2-14
Noxious Weeds	2-17
Heritage Resources	2-21
Geologic Resources	2-28
Mineral Resources	2-30
Fish Resources	2-32
Water Resources	2-42
Transportation/Roads	2-72
Wildlife/Plants	2-78
Timber Resources	2-88
Scenic Resources	2-107
Recreation Resources	2-108

Chapter 3 - Financial Review	3-1
Chapter 4 - Forest Plan Amendments/Interpretation Process.	4-1
Amendments.	4-1
Chapter 5 - Ongoing Planning Actions	5-1
Northwest Forest Plan.	5-1
Appendix A - Summary of Flood Repair and Associated Monitoring	A-1
Appendix B - List of Preparers.	B-1
Figures	
Figure 1. Mt. Hood National Forest Volume Summary	2-90
Figure 2. Silvicultural Harvest Methods (Acres Treated - 3,344)	2-91
Figure 3. Reforestation and Timber Stand Improvement Accomplishments.	2-93
Figure 4. Mt. Hood National Forest Budget Trends	3-4
Figure 5. Mt. Hood National Forest FTE/Position Usage.	3-4
Maps	
Map 1. Mt. Hood National Forest Watersheds - Watershed Analyses Completed	5-26
Tables	
Table 1. Summary Comparison Chart	S-8
Table 2. Fire Causes and Types of People 1990-1998	2-3
Table 3. Summary of Wildfires - Acres Burned by Size Class 1990-1998.	2-3
Table 4. Fire Management Effectiveness Index	2-4
Table 5. Prescribed Burning - FY 99.	2-8
Table 6. Measured Detrimental Impacts by Silvicultural Treatment and Logging System	2-12
Table 7. Summary of Percent Soil Damage by Planning Area.	2-12
Table 8. Total Acres with Range Vegetation Management Objectives	2-16
Table 9. Acres of Noxious Weed Treatment	2-17

Table 10. CCC Historic Structure - Summary Report	2-24
Table 11. Status of Threatened or Endangered Fish on Mt. Hood National Forest in 1999.	2-32
Table 12. Stream Shade Evaluations in Pine/Oak Vegetation Types.	2-37
Table 13. Stream Habitat Pre- and Post-Project Monitoring.	2-38
Table 14. Aquatic Mollusc Survey and Manage Results	2-39
Table 15. ARP Results by Watershed, Rain-on-Snow Zone	2-51
Table 16. ARP Results by Watershed	2-53
Table 17. Watershed Impact Area (Percent of the Area Assessed in a Hydrologically Disturbed Condition	2-53
Table 18. Summary of 7-Day Maximum Water Temperature.	2-56
Table 19. Summary of Stream Temperature Monitoring Results - Zigzag Ranger District	2-57
Table 20. Road Maintenance Levels.	2-75
Table 21. Wildlife Resources.	2-84
Table 22. Timber Volume Sold/Harvested - FY 99.	2-89
Table 23. Forest Health Indicators - Insect Activity	2-96
Table 24. Forest Health Restoration Spreadsheet	2-99
Table 25. Percent of Acres Harvested by Management Area Category	2-103
Table 26. Acres Harvested by Forest Plan Management Area in FY92, FY93, FY94, FY95, FY96, FY97 and FY98.	2-104
Table 27. Budget Levels Predicted/Actual (Partial List)	3-2
Table 28. Watershed Analyses Completed in FY 99.	5-3
Table 29. Jobs-in-the-Woods Expenditures (thousands \$).	5-3

Summary



Summary

The matrix found in Table 1 offers a comparison of key resource monitoring items and program accomplishments for fiscal years 91 through 99. This comparison chart is the start to identifying long term trends in resource conditions and program outputs. Some conclusions can be drawn at this time. There are indications that Forest Plan adjustments are needed in some cases. Adjustments in management practices are taking place (in response to information learned through our monitoring efforts). These include a reliance on concessionaires for campground management, development of a prescribed natural fire policy for Wilderness areas and a focus on using designated skid trails to protect soil resources.

Projections of accomplishment that are not consistent with the original Forest Plan include Allowable Sale Quantity and Total Sale Program Quantity, Road Construction and Reconstruction and Trail Construction and Reconstruction. This is due to lower budgets and significantly lower timber outputs as well as additional requirements outlined in the Northwest Forest Plan.

Continued monitoring is necessary to assess management activities and draw meaningful conclusions. A more detailed examination of Key Resource Areas can be found in Chapter 2 of this document.

Based on overall forest condition, review of monitoring information and ongoing management activities, the Mt. Hood Forest Plan as amended by the Northwest Forest Plan of 1994 is sufficient to guide management of the Forest over the next year. Minor nonsignificant amendments will be made as the need arises. A review/revision of the Forest Plan is expected upon completion of revised planning regulations.

Summary of Key Resource Conditions

Air Quality

The management activities that affect air quality by the Mt. Hood National Forest remained in compliance throughout the monitoring period (10/98 to 9/99). No deviations from the State's Smoke Management Plan occurred and compliance with all Forest Service and State Air Quality Guidelines were maintained. A total of 2,161 acres were treated during the course of the period with a total of 16,140 tons consumed. No intrusions into smoke sensitive areas occurred as a result of Forest management activities. Visibility in the Mt. Hood Wilderness Class I Area was not significantly impaired as a result of management activities. All burning operations were properly recorded and submitted to Salem Smoke Management for approval and recording purposes.

In addition to monitoring prescribed fire emissions, air quality monitoring on the Mt. Hood National Forest occurs within a cooperative framework among the National Forests of western Oregon. The focus of the work is on assessment of air pollution effects to forests through biomonitoring, specifically by monitoring of lichen abundance (especially of those species known to be sensitive to air toxins) and tissue analysis. Monitoring occurs in cooperation with the Continuous Vegetation Survey (CVS) program; lichen plots are collocated with CVS plots such that in addition to lichen data, a wide range of forest composition and structure attributes are monitored as well. Lichen plots are expected to be revisited on a four-year cycle. Methodologies are adapted from and fully interfaceable with the EPA/FS National Forest Health Monitoring Program.

At the present time, 146 plots (100% of the total target number) have been installed. It appears that the western portions of the forest have lower amounts of toxin-sensitive lichens than normally would be expected. Also, lead levels in lichen tissues collected from the Mt. Hood Wilderness appear higher than would be expected in a completely natural environment. These results are only preliminary and have not been subjected to rigorous statistical testing or peer review. It has also not been established that the effects observed to lichens are the result of air pollution. Further investigation is underway to strengthen the analysis and findings.

Fisheries

The continued decline in numbers, listing and proposed listing of stocks of fish which inhabit the Mt. Hood National Forest are indicators of the overall weak condition of anadromous wild fish in the Pacific Northwest. As habitat managers, Forest personnel continue to protect and restore valuable riparian areas. Anadromous fish have a complex life history which includes freshwater, migration and saltwater phases. The available habitat on the Forest continues to be underutilized. With the implementation of the Northwest Forest Plan, and watershed restoration, instream and riparian conditions continue to improve.

Stream habitat restoration is critical to recovery of threatened and endangered stocks of salmon. Many restoration projects were monitored for their effectiveness. Most projects are meeting objectives.

Surveys of aquatic mollusks, as required under the Northwest Forest Plan began in 1998. Surveys are conducted for the Columbia dusky snail and the basalt juga on the Mt. Hood National Forest. It appears the Columbia dusky snail may be more common than initially believed, and the basalt juga species may be more rare than initially believed.

Threatened, Endangered and Sensitive (TES) Plants

Sensitive plant species found in non-forested habitats such as meadows, grasslands and balds continue to be vulnerable to impacts from noxious weed encroachment, while those species in forested habitat appear to be stable. Efforts made in 1999 to reduce impacts by recreational rock climbers at a violet *Suksdorfia* site have resulted in joint management of the site by the Forest and a climbing association. Limitations of funding and personnel did not allow for all the recommendations of the 1998 Monitoring and Evaluation Report to be completed. Recommendations for 2000 will continue to focus on habitat enhancement and monitoring of sensitive species in non-forested habitats.

Of the 548 acres of noxious weeds treated on the Forest in 1999, a majority were accomplished by manual, mechanical or biological methods. Herbicide was used as a treatment method for common hound's-tongue on the Forest for the first time, after several years of hand pulling failed to control populations. Two new invad-

ers identified in the 1998 Monitoring and Evaluation Report, Scotch thistle (*Onopordum acanthium*) and rush skeleton weed (*Chondrilla juncea*) appear to have been eradicated. Two other species groups, non-native hawkweeds and knotweeds, have established on the Forest and are a high priority for control. Not all projects that result in ground disturbance completed mitigations to reduce the potential for noxious weed establishment and spread. Further effort needs to be made to assure that all ground disturbing projects meet this requirement.

Timber, Silviculture

Prescriptions to treat forest health concerns have been implemented over the last several years. Selection cuts, salvage harvest, and commercial thinnings make up the majority of the Forest program. However, there are several areas of concern regarding current and potential future forest health issues. These include a backlog of overly dense, young stands in need of precommercial thinning, large acreage of natural fuel accumulation on the eastside of the forest, and large acreage of overly dense stands in the small diameter size class. Recommendations are for more thinning to improve forest health in both the precommercial and commercial size classes; however, adequate funding has been a barrier.

The amount of timber offered for sale in FY99, 46.5 MMBF, was below the Probable Sale Quantity of 64 MMBF. This was due to a circuit court ruling last August which prohibited the advertisement of timber sales in the region until field surveys of several plant and animal species were completed.

Evaluation

In FY 99, the timber volume offered was less than the revised Northwest Forest Plan target by 17.5 MMBF. The Forest failed to meet the NFP target because of a Circuit Court ruling which prohibited the advertisement of timber sales in Region 6 and the northern part of Region 5. The ruling, which occurred in early August, required field surveys of several plant and animal species which had not previously been done. The Forest would have achieved its target had it not been for the court imposed injunction. The injunction remained in force until February of 2000.

Wildlife

Emphasis on the Forest has shifted from monitoring to survey efforts for species presence to include Northwest Forest Plan Survey and Monitoring species. Twenty seven projects were surveyed for mollusk. A total of 198 populations of mollusk, representing 6 species were located on 8,840 project acres.

Since last fiscal year the peregrine falcon status has changed to sensitive and the lynx has just recently been listed as threatened by the US Fish and Wildlife Service. Peregrine falcons and bald eagles show stable populations. Efforts to determine the presence of lynx are still underway. Hair samples have been found that are thought to be lynx and DNA confirmation is in progress. In the mean time, GIS mapping efforts are attempting to define potential lynx habitat.

The small populations of bald eagle and peregrine falcon appear to be stable. Very little monitoring efforts have been completed for spotted owls. The philosophy on the Mt Hood has been that the retention of adequate habitat has precluded the need to monitor the spotted owl populations. Additionally, there is an ongoing demographic study that should support this theory.

Many sensitive species were not surveyed due to increasing demands on personnel and decreasing budgets. For the species that were surveyed there appears to be little change in their populations.

Fire Management

Estimates of the magnitude of the fire-dependent ecosystems on the Mt. Hood National Forest that are ecologically outside the range of natural conditions are varied. An effort to consolidate and update the forest's vegetation/fuel data will be started this year and will greatly enhance our ability to quantify any deteriorating conditions in these ecosystems. This effort should provide fire managers with the landscape-scale information that will help improve strategic decision-making in both the prescribed fire and wildfire arenas.

Summary

The risk of large stand-replacing fires escaping the Badger Creek Wilderness continues to be a threat due to current fuel conditions. A combination of management ignited fire inside the Badger Creek Wilderness and mechanical treatment outside the wilderness area will be needed to reduce the existing and future fuel hazard so that prescribed natural fire can be successful inside the Wilderness boundary. Recreation, Lands and Fire Management are working on completing the Badger Creek Wilderness Fire Management Plan.

The application of prescribed fire to natural fuels will continue to contribute to the maintenance of a healthy fire-dependent ecosystem on the forest's eastside zone. Outyear funding for prescribed fire projects with natural fuels will potentially increase our ability to treat up to 5,000 acres per year. However, if implemented, this increase could affect ambient air quality standards in small communities adjacent to the forest, the Mt. Hood Wilderness and potentially the Portland metro area.

Where feasible, mechanical treatment of activity-generated fuels will continue to maintain a high priority of choice for treatment methods. Mechanical treatment of natural fuels and timbered stands will also be necessary throughout portions of our eastside zone prior to the reintroduction of management-ignited fire.

Water

With continued implementation of Best Management Practices (BMP's), watershed restoration, and the Northwest and Mt. Hood N.F. Plans, water quality and watershed conditions are expected to be maintained and in some areas show an improving trend. For streams that have been identified as water quality limited by the Oregon Department of Environmental Quality, Water Quality Restoration Plans are being developed to describe planned restoration measures and management requirements that will over time restore water quality for the listed parameters.

In order to monitor trends water clarity over time, permanent monitoring stations have been installed on the Clackamas River (Carter Bridge) and Alder Creek (Forest boundary). Both of these watersheds serve as municipal water supplies. Other continuous turbidity monitoring stations are planned for Eagle Creek (Fish hatchery) and Fish Creek in the Clackamas River. The water monitoring stations will continuously monitor turbidity and flow depth, and provide easy data access via telephone.

Trends in summer water temperatures are monitored by a network of seasonal water temperature monitoring stations across the forest. The data will be used to study long term trends in summer water temperatures and monitor recovery in streams currently identified as water quality limited for water temperature.

In FY99 we accomplished 45 acres of watershed restoration work.

Soil

Monitoring results in 1998 and 1999 suggest that progress is being made in regard to the number of harvest units where soil damage exceeded the standards.

Soil compaction damage related to timber harvest remains a concern on the Forest. On a Forest-wide basis, the extent of damage has decreased as timber harvest levels have declined since the beginning of the decade. Where stands have been entered for the first time, regardless of the silviculture prescription, designated skid trails have been effective in limiting soil resource impacts in a manner consistent with Forest Plan standards. Activities in stands where multiple harvest entries have been made, the cumulative impacts from these prior activities plus planned treatments have a much higher likelihood of exceeding the standard for protecting soil productivity.

The reduction of damage is primarily due to three main factors. First, sale administrators and operators are working together to minimize impact. Second, advances in equipment technology reduces impacts. Third, sale areas are located on soil types that are more resistant and resilient than past sale areas.

Preliminary results continue to show that soil biology is rebounding on skid trails and roads where subsoiling was used to alleviate compaction damage.

Recreation

Recreation opportunities and condition of recreation facilities such as trails and camping facilities have declined over time due to reduced budgets. They will likely decline further if recreation budgets continue to decline. In an effort to continue to respond to recreational needs, changes in how we provide recreation opportunities will occur. The use of a concession operation of our campgrounds is one example. Moving toward additional privatization, use of reservations and increased fees are other future possibilities.

Travel and Access Management

We are continuing to move towards open road densities as identified in the Forest Plan. During the planning process, opportunities to reduce road densities are being identified. However, there is not enough funding available to implement the total reduction planned. Many of these roads identified for decommissioning will close naturally. If funding becomes available for decommissioning, the implementation rate would increase. In FY 99 approximately 27 miles of road were closed and 88 miles of road were decommissioned. We have completed the final draft of the Access and Travel Management (ATM) Plan. It was signed in early 1999.

Summary

Table 1. Summary Comparison Chart (by Fiscal Year)

Element	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	Recommendation/ Comments
Fire Management										
• Human caused fires	61	49	42	55	29	43	27	32	45	Continue monitoring, management direction achieved.
• Natural occurring	29	30	3	11	19	2	9	38	22	
Total Fires Suppressed	90	79	45	66	48	45	36	70	67	
Air Quality										
• Acres treated by prescribed fire	1,516	3,559	2,727	2,809	1,962	2,448	1,082	1,643	2,161	Continue monitoring, management direction achieved.
• Intrusions into Class I areas	0	0	0	0	0	0	0	0	0	
Soil Resources										
• Activity areas monitored	21	15	8	0	8	2	10	8	13	Restrict sub-soiling to areas that exceed 15% damage standard.
• % areas not meeting soil productivity S&Gs	25	33	36	-	0	0	70	25	8	
• Soil improvement acres	198	244	301	42	70	55	11	0	0	
Range Management										
• Permitted AUMs	7,288	3,927	3,607	3,954	1,848	1,548	1,548	1,548	1,407	Revise AMPs as scheduled. Continue monitoring.
• % of allotments receiving reviews	100	100	-	-	-	100	100	100	100	
• % sites meeting utilization S&Gs	33	42	62	51	70	88	91	94	92	
Heritage Resources										
• Evaluations/eligible			0	1	5/0	1/0	0	2/0	6/3	Complete process for those that are started.
• # of condition reviews of existing sites	52	56	0	29	7	32	73	50+	50+	
• Nominations to National Register	1	0	0	0	0	0	0	1	0	
• # of CCC maintenance projects	44	41	8	72	15	31	47	70	56	
Geologic Resources										
• Created openings on mapped earthflows	2	13	19	0	7	19	7	0	3	Continue monitoring.
• Created openings on mapped landslides	0	3	16	0	3	2	0	0	1	

Summary

Element	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	Recommendation/ Comments
• Openings not meeting S&Gs size limits	1	0	0	0	0	0	0	0	3	
Mineral Resources										
• Mineral material used by other agencies (cu.yd.)	86,000	187,500	23,000	5,000	82,000	191,850	25,500	216,700	76,200	Complete development plans for common variety sources.
• Mineral material used by MTH (cu.yd.)	110,000	78,400	4,800	9,000	12,550	13,300	151,800	52,900	56,800	
• % projects inspected for compliance	100	100	100	100	100	100	100	100	100	
• Mineral material sold to public (cu.yd.)	915	900	910	900	1,400	1,600	865	1,160	350	
• % major projects with operating plans	39	100	100	100	100	100	100	100	100	
Fish Resources										
• Acres of lakes inventoried/ improved	30/0	1,342/302	3,635/3	1,935/5	707/9	90/0	0/0	54/0	54/0	Continue surveys.
• Miles of streams inventoried/ improved	217	214/35	373/26	365/26	367/15	125/29.5	99/39.1	45/19	49/0	Continue surveys.
• Chinook salmon redd counts - WF Hood River	25	0	-	-	0	19	40	17	1	Continue monitoring.
• Lakes surveyed	30	31	17	16	4	4	0	1	1	Continue surveys.
• Riparian surveys										
-% meeting pool S&Gs	0	0.7	7	.1	1	3.8	11.3	13.6	12.0	Continue monitoring.
-% meeting LWD S&Gs	29	22	23	16	.4	0	3.2	2.1	9.8	Continue monitoring.
• % habitat structures meeting S&Gs	-	99	90	-	64	79	91	-	-	Continue monitoring.

Summary

Element	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	Recommendation/ Comments
Water Resources										
• Best Management Practices implemented?	yes	yes	yes	Inconcl	yes	yes	yes	yes	yes	Continue implementation of Best Management Practices Evaluation Process. Continue monitoring and develop a consistent cumulative effects analysis.
• Projects meeting % ARP S&Gs	-	86	87	-	-	100	100	100	100	
Transportation/Roads										
• Miles constructed/ Forest Plan projection	10/ 16.6	6.4/ 16.6	3.3/ 16.6	7.7/ 16.6	2.4/ 16.6	.6/ 16.6	2.3/ 16.6	5/ 16.6	4.6/ 16.5	Adjust Forest Plan
• Miles reconstructed/ Forest Plan projection	24.2/ 91.5	19.3/ 91.5	3.2/ 91.5	15.5/ 91.5	15.4/ 91.5	31.9/ 91.5	111.4/ 91.5	35.7/ 91.5	39.5/ 91.5	Adjust Forest Plan
• Road miles obliterated		41.0	47.5	47.4	29.4	38.9	84.2	27	89	
• Road maintenance meeting S&Gs?	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Wildlife Resources										
• Peregrine Falcon nest sites		0	2	0	1	1	0	2	2	Complete implementation Plan including site specific Habitat Mgmt. Areas and Mgmt. Direction.
• % projects meeting Bald Eagle S&Gs		100	100	100	100	100	100	100	100	Continue surveying, complete Mgmt. Plan.
• % projects meeting primary cavity nester S&Gs	Inconcl	Inconcl	39	Inconcl	90+	50	71	65	100	Continue monitoring and surveying.
• % summer range S&Gs met	100		100	-	100	NA	100	100	100	Continue monitoring.
• Pine-oak habitat S&Gs met?	yes	yes	yes	yes	yes	yes	yes	yes	yes	Continue monitoring.

Summary

Element	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	Recommendation/ Comments	
Timber Resources											
• % timber offered of Forest Plan Total Sale Program Quantity	28	15	20	13	19	30	34.4	31	22	Initiate Forest Plan adjustment to match NFP.	
• % timber offered of Forest Plan Allowable Sale Quantity	32	17	23	14	22	34	39	35	25	Initiate Forest Plan adjustment.	
• % of PSQ target offered for sale.				39 27.3 mmbf	106 41.4 mmbf	122 63.6 mmbf	114 74.0 mmbf	104 66.6 mmbf	73 46.5 mmbf		
• Silviculture acres treated (harvest methods)	8,046	5,190	3,722	1,637	2,030	1,685	1,948	3,344	3,044	Continue monitoring.	
• Silviculture activities (Ac.) (planting, fertilizer, etc.)	11,104	10,191	8,954	7,193	12,361	9,852	6,172	7,589	5,282	Continue monitoring.	
• Regeneration meets S&Gs?	yes	yes	yes	yes	yes	yes	yes	97% meets S&Gs	98%	Continue monitoring.	
Scenic Resources											
• Projects monitored		23	2	3	1	1	3	5	2	Continue monitoring of selected projects	
Recreation Resources											
• Miles trail constructed/projections	1.6/ 6.6	0/6.6	0/6.6	5/6.6	0/6.6	0/6.6	0/6.6	0/6.6	0/6.6	0/6.6	Continue monitoring
• Miles trail reconstructed/projections	14.9/ 30.5	7.9/ 30.5	14.9/ 30.5	12/30.5	14/30.5	21/30.5	14.8/ 30.5	14.8	63/ 30.5		Continue monitoring
• Wilderness issues of concern - overuse, nonconforming uses			-				Prepare Wilderness Mgmt. Plan				Continue monitoring
• W&SR Plans completed/remaining	0/5	2/3	4/1	All complete	All complete	All complete	All	All	All		Completed
• W&SR suitability studies completed	0	0	0	0	0	0	0	0	0		Defer due to budget constraints.

Summary

Element	FY 91	FY 92	FY 93	FY 94	FY 95	FY 96	FY 97	FY 98	FY 99	Recommendation/ Comments
Financial Review										
• Full plan implement budget/actual expense	65.3MM \$/44.4M M\$	65.3MM \$/39.5M M\$	65.3MM \$/40.9M M\$	65.3MM \$/32.7M M\$	65.3MM \$/31.7 MM\$	65.3MM \$/30.4M M\$	65.3MM \$/38.2M M\$	65.3MM/ 33.7MM \$	65.3MM/ 25.7MM \$	

Chapter 1 Introduction



Chapter 1

Introduction

The Land and Resource Management Plan (Forest Plan for the Mt. Hood National Forest) as amended in 1994 by the Record of Decision for the Northwest Forest Plan, was approved by Regional Forester John F. Butruille on October 17, 1990, and implementation of the Forest Plan began on February 11, 1991. The Forest is now in its ninth year of management under the Forest Plan direction.

The Forest Plan established integrated multiple use goals and objectives, established standards and guidelines for resource activities, identified management areas and set their direction, established the maximum decadal sale quantity, and determined monitoring and evaluation requirements.

A part of implementing the Plan involves a commitment to monitor and evaluate how well we are doing. Monitoring provides the decision makers and the public information on the progress and results of implementing the Forest Plan. This document highlights what the Forest is doing in key resource areas.

Monitoring is the gathering of information and observing management activities to provide a basis for periodic evaluation. The overall objective of monitoring is to ensure that the commitments we made in the Forest Plan are being correctly applied and are achieving the desired results.

Monitoring is fundamental for us to fulfill our responsibilities as stewards of the land. The years activities are not complete unless we monitor the effects of those activities, evaluate the results (i.e. what do the results mean?) and recommend actions or modifications to be made (i.e. what should be done now?). This process allows the Forest Plan to remain an active, usable document.

This report is composed of five chapters:

Chapter 1 - Introduction

Chapter 2 - Accomplishments/Results/Recommendations

Summarized individual resource program accomplishments, activities monitored, evaluations, and recommendations.

Chapter 3 - Financial Review

Contains information which describes the Mt. Hood National Forest in financial terms.

Chapter 4 - Forest Plan Amendments

Reviews amendments made to date.

Chapter 5 - Ongoing Planning Actions

Highlights a variety of additional planning and analysis activities, and implementation of the Northwest Forest Plan.

Although some information with respect to Forest Plan implementation may be reported now, continued monitoring allows meaningful evaluation and conclusions to be made. As monitoring continues, trends are being established that will provide valuable information for shaping the future management of the Forest.

A review of the plan was made three years ago in an effort to determine if major changes had taken place to cause a significant amendment or revision to our plan. It was determined that because the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl had significantly modified our plan in 1994, no further significant revision was needed at that time. New planning regulations are in the development process now. Once they are completed, the Forest Plan will likely be revised.

Chapter 2 Accomplishments/Results/ Recommendations



Chapter 2

Accomplishments/Results/ Recommendations

Monitoring Element: Fire Management

Goal

The overall goal of fire management is to support land and resource management goals and objectives. This program includes all activities for the protection of resources and other values from wildfire. Fire programs are to be implemented consistent with Forest Plan Standards and Guidelines, Management Prescriptions, and the Pacific Northwest Plan.

The 1999 Fire Season

The 1999 fire season was represented by average to below average rainfall conditions throughout the Pacific Northwest area. There were periods when drying conditions raised the fire danger levels to high in the month of September. A total of 67 fires were reported in 1999: 22 lightning and 45 human-caused fires. Reported acreage burned totaled 28 acres. No industrial operations fires occurred in 1999. Cooperative relations with other agencies continued to be well coordinated. Other fire management program activities (e.g. Prevention and Detection) were accomplished within expectations.

Monitoring Activities and Evaluation

The Forest Plan identified three fire protection and two fuel treatment objectives to be monitored and evaluated in determination of fire management's capability to attain other land and resource management objectives. For each objective, information is collected annually. Information for objectives one through three are to be analyzed and results reported every five years. Objectives four and five are to be reported annually. The five fire management objectives and their current status are:

- ① Are the number of human-caused wildfires within levels considered in the plan?

Unit of measure, number of wildfires by cause and by type of people.

Table 2. Fire Causes and Type of People, 1990-1999

Causes	No.	%	Type of People	No.	%
Equipment Use	13	3.2	Owner	2	.5
Smoking	105	25.5	Permittees	5	1.2
Campfire	211	50.4	Contractor	7	1.7
Debris Burning	9	2.4	Public Employee	8	1.9
Railroad	0	0.0	Local Permanent	0	0
Arson	19	4.6	Seasonal	4	.97
Children	2	.5	Transient	13	3.5
Unknown	55	13.4	Other	30	8.7
			Recreation Visitor	300	81.6
Totals	414	100		414	100

Are the number of, size of, and intensity of wildfires within levels considered in the plan?

Unit of measure, number of wildfires by size and intensity.

Table 3. Summary of Wildfires - Acres Burned by Size Class 1990-1999

Size Class (Acres)	Number Fires	Acres Burned by Fire Intensity Level						Total Acres
		1	2	3	4	5	6	
D (100-299)	7	0	250.0	837.0	176.0	0	0	1,263.0
C (10-99)	7	26.0	51.1	88.0	0	20.0	0	185.1
B (.26 - 9)	99	42.1	49.5	12.3	6.8	5.7	3.0	119.6
A (<.25)	539	61.3	4.6	1.4	.1	0	0	67.4
Total*	652	129.6	355.2	938.7	182.9	25.7	3.0	1,635.1

*Includes both lightning and human-caused wildfires.

Is the Fire Management Effectiveness Index (FMEI) within levels expected in the Plan?

Unit of measure, Fire Management Effectiveness Index. The equation for determining the FMEI is to total presuppression (FFFP), suppression (FFFF), and net value change (NVC) cost and divide the total by the number of acres protected.

Table 4. Fire Management Effectiveness Index

Year	FFFP \$	FFFF \$	NVC \$	Total	Acres	FMEI
1990	1,312,000	134,000	86,000	1,532,000	1,068,000	1.43
1991	1,359,000	4,963,000	692,000	7,014,000	1,068,000	6.57
1992	1,620,000	1,078,000	164,000	2,862,000	*1,034,000	2.77
1993	1,814,000	872,000	3,000	2,689,000	1,034,000	2.60
1994	1,839,000	1,038,000	313,000	3,190,000	1,034,000	3.09
1995	1,911,000	66,000	52,000	2,029,000	1,034,000	1.96
1996	2,162,000	24,000	28,000	2,214,000	1,034,000	2.14
1997	2,583,000	135,000	23,000	2,741,000	1,034,000	2.65
1998	2,072,000	105,100	40,000	2,217,000	1,034,000	2.14
1999	1,895,000	127,000	28,000	2,050,000	1,034,000	1.98
Average	2,063,000	949,000	159,000	3,171,000	1,041,500	3.03

*Reduction in total acres due to the creation of the Columbia River Gorge National Scenic Area and lands being transferred to the Scenic Area for management.

Results

The threshold of concern for items #1 and #2 above is, “no more than 20% departure from the expected number per decade.” It was anticipated that the human-caused occurrence would average 559 fires/decade and 56/year. Presently, the forest is averaging 46/year. Additionally, the Forest Plan estimated an average annual acreage burned by wildfire to be 408 acres/year. For the past nine years of this decade the forest has averaged 182 acres/year. These numbers are well below the threshold of concern.

The Fire Management Effectiveness Index (#3) represents a measure of the combination of mitigation efforts which encompass fuel treatments, fire prevention programs, and cost effective suppression programs. It is being measured against a historical level of forest activities and fire suppression efforts. The Plan's estimate for the FMEI for the first decade is 2.873. Item #3 has a threshold of concern of "no more than 40% departure from expected number per decade." For the first nine years of decade one, the forest annual average of 3.03 is slightly higher than estimated in the Plan, but well below the unacceptable threshold level of 4.02.

Are desired residue (fuel) profiles being met?

As part of the total fire and fuels management program, the forest also continued to meet the desired fuel residue profiles. All districts reported that they had met the profiles with less than a 10% deviation from what was stated in the environmental analysis or other forest standard. See Air Quality Monitoring Element for acres treated and tons of fuel consumed.

Treat natural fuels on estimated 800 acres annually (a projected average for first decade of the Plan).

For the current reporting period, 285 acres were treated. Less than expected accomplishment is due to the acres that were originally targeted for treatment were held up due to unanticipated mollusk survey work that needed to be accomplished.

Recommendations

Fire and fuels management direction is being achieved and current program effort should continue.

- Continue to reduce activity fuel residues through a variety of treatment methods.
- Continue to plan for and treat natural fuels to better mitigate identified forest health issues.
- Continue to collect and consolidate data to support the assessment of ecological conditions in the context of the Range of Natural Conditions for fire dependent ecosystems.
- Continue to work towards the completion of the Badger Creek Wilderness Fire Plan.
- Continue to emphasize prevention of industrial operation caused fires.
- Continue to focus prevention and presuppression efforts on reducing campfire and smoking caused fires.
- Implement the Federal Wildland Fire Policy.

Since the vast majority of our campfire incidences occur near water-oriented campsites, our prevention and presuppression forces will continue to focus their efforts there.

Monitoring Element: Air Quality

Prescribed Fire Emissions

Goal

The overall goal is to manage prescribed fire emissions to meet the requirements of the State Implementation Plan (SIP) for the Clean Air Act. Management activities will also be managed to ensure that no deviations to the State Smoke Management Plan occur.

Accomplishment

The management activities that affect air quality by the Mt. Hood National Forest remained in compliance throughout the monitoring period (10/98 to 9/99). No deviations from the State's Smoke Management Plan occurred and compliance with all Forest Service and State Air Quality Guidelines were maintained. A total of 2,161 acres were treated during the course of the period with a total of 16,140 tons consumed. No intrusions into smoke sensitive areas occurred as a result of Forest management activities. Visibility in the Mt. Hood Wilderness Class I Area was not significantly impaired as a result of management activities. All burning operations were properly recorded and submitted to Salem Smoke Management for approval and recording purposes.

Table 5. Prescribed Burning - FY 99

Burn Type	Acres Treated by Area				Total
	Hood River	Barlow	Clackamas River	Zigzag	
Broadcast	0	0	0	0	0
Piles	0	400	150	20	570
Underburn	5	1,586	0	0	1,591
Total Acres	5	1,986	150	20	2,161
Tons Consumed	13	15,582	491	54	16,140

Summary

The Forest continues to reduce emissions from burning activities. The goal of the Forest Plan is to reduce emissions 63% by the end of the first decade of the Plan, and that is being achieved.

Lichen Biomonitoring

In addition to monitoring prescribed fire emissions, air quality monitoring on the Mt. Hood National Forest occurs within a cooperative framework among the National Forests of Oregon and Washington. The focus of the work is on assessment of air pollution effects to forests through biomonitoring, specifically by monitoring lichen distribution and abundance (especially species sensitive to acid rain or enhanced by eutrophication) and analyzing pollutant concentrations in lichen tissue. Monitoring occurs in cooperation with the Continuous Vegetation Survey (CVS) program; lichen plots are co-located with CVS plots so that changes in lichen communities related to forest composition and structure may be differentiated from air pollution effects. Lichen plots are monitored on a four-year cycle, once every ten years. Methodologies are adapted from, and fully inter-faceable with, the EPA/FS National Forest Health Monitoring Program.

Between 1994 and 1997, 146 CVS plots (100% of the total target number) were installed. An additional 51 plots were monitored in the Mt. Hood Wilderness during a pilot study in 1993. In 1999, the primary accomplishment was the establishment of a web-site from which lichen monitoring data, estimates of acid rain (kg/ha/yr sulfur and nitrogen compounds), and pollution scores based on lichen communities may be obtained. The url for this website is <http://www.fs.fed.us/r6/aq/lichen>. Users may design their own queries to get data from the Mt. Hood, Siuslaw, Willamette, Deschutes, Gifford Pinchot, Umpqua, Winema, Wallowa-Whitman National Forests and the Columbia River Gorge National Scenic Area. Data from all forests is fully interfaceable. Users may map distribution of sensitive species, and find out where sulfur, nitrogen, lead and other pollutants are elevated. In addition to detailed forest maps, a series of interchangeable base maps are provided that can be used to interpret species distribution. Base maps include sulfur and nitrogen deposition, precipitation, vegetation zones, temperature, and elevations.

Much of the Mt. Hood National Forest experiences relatively little air pollution. Specifically, deposition of acidic sulfur and nitrogen compounds and accumulation of nitrogen and sulfur in lichens throughout the south half of the Mt. Hood NF are within background levels observed at clean sites throughout the Region. However, incipient impairment of air quality has been detected in the north half of the Forest, particularly along the western, northern and eastern boundaries. Five most sensitive lichens: *Nephroma bellum*, *N. resupinatum*, *Pseudocyphellaria anthraspis*, *P. anomola*, and *P. crocata* are very sparse or absent in expected habitats in the northwest part of the Forest, particularly in the Bull Run watershed, and other sites in the Columbia Gorge and Zigzag Ranger Districts. Nine sites in these Districts were at the threshold for maximum tolerable levels of sulfur and nitrogen pollution for normal growth of the region's most sensitive lichens. If air quality continues to deteriorate, declines in biodiversity and abundance of sensitive species and their ecological functions, can be expected.

Lead may be the criteria pollutant of greatest concern on the Mt. Hood National Forest. Of the 191 sites where lead and other metal concentrations in lichen tissue were measured, 35 (20%) had elevated lead levels. Most of these sites were in the northern half of the forest. Approximately half of the elevated sites were in the Mt. Hood Wilderness, the Mt. Jefferson Wilderness, the Columbia Wilderness, or the Bull Run Watershed. In a clean area, only 2.5% of plots would be expected to have elevated tissue readings. On the Willamette National Forest, for example, lead levels were elevated at only 4.5% of plots, including sites near major roads.

Lichen tissue concentrations of other toxic metals (Cd, Cr, Ni and Zn) were elevated at fewer sites (< 5%), a rate comparable to other national forests in the Region. Again, most of the sites with high values were in the north half or along boundaries of the Forest. Elevated pollutant concentrations at Old Maid Flats, Highway 26 near Tollgate Campground, the parking lot at Timberline lodge and in the Zig Zag River Basin, are most likely attributable to local pollution from vehicles and power generators. Although pollution from roads and campgrounds is localized, high vehicle traffic does bring air pollution to Wilderness boundaries and into areas, such as Old Maid Flats, of special botanical interest.

Local traffic or human activity does not explain elevated pollutant concentrations and sparsity of sensitive lichens at other sites. Most of the pollution reaching the Mt. Hood National Forest originates in the Portland metropolitan area, the Columbia River Gorge and northeast of the Forest. Pollutants come from mobile sources, small and large urban/industrial point sources, dust, and agriculture. A recent amendment to the Columbia River Gorge National Scenic Area Plan by the Columbia River Gorge Commission to protect and enhance air quality in the Scenic Area may ultimately benefit air resources on the Mt. Hood National Forest. For more detailed information about lichen biomonitoring, contact Linda Geiser at the Siuslaw National Forest Headquarters, P. O. Box 1149, Corvallis, OR 97330 or at lgeiser@fs.fed.us.

Recommendations

- A strategy should be developed for airing concerns about air quality impacts to forest health.
- Continue lichen monitoring and coordination with EPA.
- Continue on-site monitoring of suspended particulate emissions created as a result of prescribed fire activities.
- Forest managers should support and participate in bi-state efforts to continue monitoring and help to develop and implement a strategy to protect air quality in the Scenic Area and the Mt. Hood National Forest.

Monitoring Element: Soil Resources

Goal

The primary goal of soil management is to maintain or enhance soil productivity while conducting forest management activities. Standards in the Forest Plan address the physical and biological aspects of soil productivity. Standards, specific to maintaining physical soil quality properties, require that no more than 15% of an activity area is to be in a degraded condition from the combined impacts of compaction, displacement, or severe burning.

Organic carbon is an important energy source for the microbiological component of the soil ecosystem. Organic matter as large wood on the forest floor or smaller woody material, including the litter layer, are important sources of organic carbon. Maintenance of carbon cycling through conservation of large wood material is addressed through the standard identified for wildlife habitat needs. The results of monitoring for large wood is presented in the wildlife section.

Accomplishments

Two needs guided the direction for soil monitoring in 1999. First, the need to continue to monitor those areas that have been harvested previously so that cumulative effects can be documented. Second, the need to document monitoring done on planning areas and specific stands proposed for some level of timber harvest activity so that effects can be better predicted. Results from monitoring reflect this direction - cumulative effects and existing condition.

Thirteen harvest units were monitored for detrimental soil impacts from ground based logging systems and fuel treatments. One of the monitored units had soil damage exceeding the 15% standard. The remaining twelve units were within the standard, with ten units under 10%. Ten of the thirteen monitored units had previous harvest activity as summarized in Table 6.

Table 6. Measured Detrimental Impacts by Silvicultural Treatment and Logging System

Silvicultural Treatment	Logging System	Fuel Treatment	Previous Entries	Percent Soil Impacts
Regeneration	Tractor	Landing pile	0	6
Regeneration	Tractor	Landing pile	0	4
Thinning	Tractor/cable	Landing pile	0	3
Shelterwood	Loader/tractor	Grapple	1	9
Overstory Removal	Loader/tractor	Grapple	1	9
Thinning	Tractor	Landing pile	1	5
Thinning	Tractor	Landing pile	1	10
Thinning	Tractor	Landing pile	1	4
Thinning	Tractor	Landing pile	1	7
Shelterwood	Tractor	Grapple	1	1
Shelterwood	Tractor	Grapple	1	3
Understory Thinning	Tractor	Grapple	>1	13
Understory Thinning	Tractor	Grapple	>1	19

Four planning areas were evaluated to determine existing soil damage within stands proposed for silvicultural treatment to determine cumulative impacts to soil quality. A total of six stands within the planning areas were monitored. Table 7 summarizes the results.

Table 7. Summary of Percent Soil Damage by Planning Area

Planning Area	Previous Entries	Estimated % Damage
Douglas Cabin	1	3
Douglas Cabin	1	2
Bear Knoll	1	1
Bear Knoll	1	1
Juncrock	1	3
Jordan	>1	7

With the exception of Jordan, planning areas examined show little existing damage. The relatively small amount of existing impact was usually the result of a temporary road or a few old skid trails in some of the stands proposed for entry within a planning area. Stands within the Jordan planning area have been entered previously and more intensively than any of the stands in any other planning area. The Forest continues to apply restoration treatments, typically subsoiling, to activity areas where management standards have been exceeded. However, the concern for damage to root systems of residual trees in thinned stands limits subsoiling as a management tool to alleviate compaction. The earliest opportunity for rehabilitation treatment in these stands would occur with a regeneration or shelterwood silvicultural prescription.

The Forest also continues to work with Oregon State University and the Pacific NW Research Station on a subsoiling effectiveness study located on the Silver Timber Sale. Preliminary results continue to show that soil biology (mushrooms and truffles, specifically) is rebounding on skid trails and roads where subsoiling was used to alleviate compaction damage. At least one more year of data will be collected by OSU before final conclusions are drawn.

Recommendations

Monitoring results in 1998 and 1999 as compared to previous years would suggest that progress is being made with regard to the number of harvest units where soil damage exceeds the standard. This trend is likely due to three main factors. First, sale administrators and operators are doing a very good job of minimizing soil damage. Second, advances in equipment technology reduces the compaction impacts. And third, district sale areas (especially on the east side) are currently operating on soil types that are fairly resistant and resilient. Monitoring to determine cumulative effects should continue in order to find out whether this trend will continue. Existing conditions monitoring and documentation needs to continue also in order to provide a sound basis for cumulative effects estimation in NEPA documents. Units monitored for existing conditions should also continue to be tracked and monitored as harvest, fuel treatment, and rehabilitation (if needed) occur in order to verify estimates made by NEPA documents.

Monitoring Element: Range Management

Goal

Within the constraints imposed by basic plant and soil needs, provide forage for utilization by wildlife and permitted domestic livestock.

Existing Program

There were three range allotments grazed (out of a total of 6) on the Mt. Hood NF in 1999. Two grazing permits were canceled in 1993 resulting in one vacant allotment. Four permits on three separate allotments were granted non-use for permittee convenience. This resulted in two allotments receiving total rest for the entire grazing season and half the permitted livestock running on two other allotments. Permitted livestock use for the season totaled 1407 AUM's out of a total of 3827 allowable for the Forest. New fences were constructed or maintained in various key areas to gain better livestock control and ensure attainment of Forest Plan Standards and Guidelines.

Evaluation/Monitoring - Long Term and Short Term

Long Term - Vegetation/Trend

Studies to monitor existing condition and long-term trend in vegetation are in place on all allotments. Plots are visited once every 5 years to record plant species diversity, percent bare soil, plant vigor and other factors which allow us to determine the range condition (excellent, good, fair, poor, very poor) and the vegetative trend (upward, static, downward) as compared to the "Potential Natural Community/Desired Future Condition". These measurements, along with other observed vegetative changes occurring across the landscape, (such as wild-fire, flood, noxious weed infestation) are considered in determining whether or not we are achieving Forest Plan Objectives. Results show that of the 172,087 acres having range vegetation management objectives, 51% (87,764 ac) are meeting Forest Plan objectives, 34% (58,509 ac) are moving toward Forest Plan objectives, and 15% (25,813 ac) are of undetermined status, with 1% (1,721 ac) not meeting or moving toward Forest Plan objectives. For riparian areas (19,300 ac), 47% (9,071 ac) are meeting Forest Plan objectives, 25% (4,825 ac) are moving toward Forest Plan objectives, 20% (3,860 ac) are of undetermined status, and 8% (1,544 ac) are not meeting or moving toward Forest Plan objectives. (See table for summary) There were 2 long term monitoring plots read this fiscal year out of a total of 18 established forest wide.

Short Term - Utilization Studies

Utilization monitoring studies were conducted on all allotments. These studies are used to monitor the consumption of the current years forage by both permitted livestock and wildlife. Out of the thirty-four established monitoring sites, which are visited annually, twenty-five are located within riparian areas. Of those sites, 92% (23) met Forest Plan Standards and Guidelines. The remaining nine sites are located within the uplands, and 100% (9 sites) were in compliance with the Forest Plan.

Table 8. Total Acres with Range Vegetation Management Objectives
(includes Riparian Acres)

Range Allotment Monitoring			
	Verified	Estimated	Total
Acres with Range Vegetative Management Objectives			172,087
Acres Monitored in Current FY			132,554
Acres Meeting Forest Plan Objectives	18,530	60,163	78,693
Acres Moving Toward Forest Plan Objectives	19,500	34,184	53,684
Acres Not Meeting/Moving to Forest Plan Objectives	0	177	177
Acres of Undetermined Status			39,533
Riparian Area Within Allotments			
	Verified	Estimated	Total
Riparian Acres			19,300
Riparian Acres Monitored in Current FY			15,440
Riparian Acres Meeting Forest Plan Objectives	3,500	5,571	9,071
Riparian Acres Moving Toward Forest Plan Objectives	2,700	2,125	4,825
Riparian Acres Not Meeting/Moving Toward Forest Plan Objectives	300	1,244	1,544
Riparian Acres of Undetermined Status			3,860

Recommendations

Continue revisions to allotment management plans as scheduled. Maintain coordination with Fish/Watershed and Soils specialists. Use the Proper Functioning Condition Protocol (PFC) within riparian areas on range allotments.

Monitoring Element: Noxious Weeds

Goal

Control noxious weed infestations and present their spread in accordance with the Mt. Hood National Forest Noxious Weed Plan, the Final Environmental Impact Statement (FEIS) for Managing Competing and Unwanted Vegetation, the Mt. Hood National Forest Land and Resource Management Plan and applicable state and Federal laws and regulations.

Existing Program

The Mt. Hood National Forest cooperates with the Oregon Department of Agriculture, Wasco and Hood River Weed Departments, Bonneville Power Administration and the Confederated Tribes of Warm Springs to conduct inventories and treat noxious weeds.

In 1999, efforts were focused on the control of knapweed species (*Centaurea* spp.) west of the Cascade Crest, tansy ragwort (*Senecio jacobaea*) east of the Crest and the control of recent invaders with relatively small areas of infestation including hound's tongue (*Cynoglossum officinale*), common toadflax (*Linaria vulgare*) and non-native hawkweeds (*Hieracium aurantiacum* and *H. pratense*).

Table 9. Acres of Noxious Weed Treatment

Acres Treated by Method					
Chemical	Manual	Mechanical	Biological	Fire	Total
131	322	20	75	0	548

Monitoring Questions

- Are known untreated weed sites continuing to spread?

Yes. Spotted, diffuse and meadow knapweeds east of the Cascade Crest and knotweed have been the biggest increasers.

- Are new infestations occurring?

Yes. New populations of knotweed and hawkweed have been detected.

- Are biological control agents controlling the spread of noxious weeds?

Some control is likely for noxious weed species that have widely distributed and well established biological control agents such as Scot's broom (*Cytisus scoparius*) and tansy ragwort west of the Crest. Biological controls for the knapweeds have had minimal effect thus far. No biological controls have been approved for hound's-tongue, hawkweed, knotweed and toadflax.

- Are mitigation measures to reduce the risk of noxious weed establishment being implemented for all ground disturbing activities?

Most, but not all, ground disturbing activities have mitigation measures implemented to reduce the risk of noxious weed infestation.

- Do herbicide treatments for noxious weeds follow standards and guidelines set in the FEIS for Managing Competing and Unwanted Vegetation?

Yes.

Results

An environmental assessment that allows for the use of herbicides as a treatment method on the Barlow Ranger District was completed in 1998, with the first applications made in FY 1999. Prior to this, all treatments on the District were restricted to manual, mechanical, biological or fire methods. As a result, herbicide treatment accounted for a greater percentage of the total treatment acres on the Forest compared to 1998, 24 versus 2 percent respectively. The Barlow target species was hound's-tongue, which had been treated manually in 1997 and 1998 with little effect on spread. The effectiveness of herbicides at these sites will not be known until the spring of 2000.

The total amount of active ingredient used in herbicide treatment on the Forest in FY 1999 was less than one pound.

Chemical control was also used at 7 high priority knapweed sites on the westside of the Forest to check the spread of these species from east of the Cascade Crest. The amount of herbicide now needed at these sites is greatly reduced from the first year of application, however, residual seed in the soil continues to germinate, making future treatments necessary.

A survey was conducted for meadow hawkweed and orange hawkweed at a known infestation in the vicinity of Lolo Pass. It was determined that these two species now occupy approximately 5 acres. An effort to control the population by mechanically cutting the flower heads to reduce the production of seed is not expected to be a long-term solution because these species reproduce vegetatively. At this time, no biological control agents are available for non-native hawkweeds. As this infestation is one of only two known in Oregon, it will be important to have additional treatment options.

New infestations of non-native knotweeds (*Polygonum sachalinense*, *P. cuspidatum* and *P. polystachyum*) were located on the Forest in 1999. All are relatively small in area, however these species are very difficult to control and therefore have the potential to greatly expand. Resources affected would include any that are dependent on riparian habitat including fisheries and recreation.

Biological agents that are poorly distributed on the Forest were collected from sites where they are well established and moved to areas where they are not. Most of this activity involved the knapweed seed head fly (*Urophora quadrifasciata*).

Recommendations

- Assess the effectiveness of herbicide treatment for hound's-tongue. If the results are positive, continue to target this species for herbicide treatment on Barlow District.
- The control and eradication of the hawkweed infestation at Lolo Pass should be a high priority for the Forest. An Environmental analysis allowing for herbicide treatment needs to be considered.
- Monitor the spread of knotweed on the Forest and explore options for control.
- All projects that result in ground disturbance need to have mitigations in place to reduce the risk of noxious weed infestation and spread. These mitigations should be reviewed post-project to determine their effectiveness.
- Continue to work with Oregon Department of Agriculture to establish biological controls on the Forest.

Monitoring Element: Heritage Resources

Goal

The monitoring goal is to ensure that heritage resources are being managed, protected, and interpreted according to the Forest Plan's Standards and Guidelines. The Standards and Guidelines are designed to locate, protect, maintain and/or enhance significant prehistoric and historic sites for scientific study, public enjoyment, education and interpretation. A second monitoring goal is to ensure that American Indian rights are being protected on National Forest lands, and that appropriate coordinating activities are occurring.

To accomplish these goals, six monitoring elements were identified in the Forest Plan.

- Are American Indian rights being protected on National Forest lands and are projects with activities or areas of concern to Indians being coordinated with appropriate Tribal representatives?

The Confederated Tribes of the Warm Springs Reservations are included in all scoping efforts. The Barlow District Ranger is the Tribal contact for the Forest. He meets on a regular basis with the CTWS to discuss a variety of resource issues. In addition to the formal NEPA scoping, the Forest has developed and maintains informal contacts with the CTWS. The implementation of a memorandum of understanding between the Forest and the CTWS, signed in July, 1997, regarding the management of huckleberry habitat on the Forest, continues to be very successful.

Zigzag

In April 1998, the Forest became involved with the Warm Springs Sustainability Project. This project is in partnership with Oregon State University and the CTWS who received a joint 2-year renewable grant from the Ford Foundation. The purpose of the grant is to explore ways to support and promote cultural community sustainability. The Forest's involvement is to work with the CTWS and develop projects that enhance culturally important areas such as those that contain huckleberries and camas. In a somewhat related project, a Ph.D. candidate is preparing a dissertation which involves mapping camas field locations in GIS. This information will be useful for both the Forest and CTWS. These two projects are continuing in FY 99.

Hood River/Barlow

The Confederated Tribes of the Warm Springs are contacted at least once for every project. Follow-up consultation is on-going, primarily in regard to fisheries. Additional non-project contacts include management of the Bear Springs Compound, ANPO, as well as fisheries planning. Additional consultation by Hood River included discussions on management of Spotted Owl areas across agency boundaries.

Clackamas River

The District began consultation in FY98 with the CTWS regarding the transfer of management of the Breitenbush Lake Campground to the CTWS and the closure of the portion of Forest Road 4220 between Horseshoe Lake and Breitenbush Lake (within the McQuinn Strip) . After consultation over the phone in FY98, an onsite meeting was held in October 1998. Consultation is also routine for other projects including eight timber sales. Huckleberry enhancement and lynx habitat are part of the discussions.

- Are significant (National Register eligible) historic buildings and structures being maintained, stabilized, and repaired according to historic preservation standards?

The Timberline Lodge Historic Building Preservation Plan (HBPP) was completed in FY98. This plan will “provide managers credible alternatives for routine maintenance, rehabilitation, restoration, and replacement of historic fabric throughout the building.” Implementation occurred when the Programmatic Agreement for the HBPP was signed in FY99. The HBPP was incorporated in an Environmental Assessment prepared for the Timberline Lodge Master Development Plan Amendment and Forest Plan Amendment #12. The Master Development Plan will allow future upgrading of Timberline Lodge while the Forest Plan Amendment designates Timberline Lodge and its immediate environs as a Special Interest Area (A-4 Land Allocation) within the existing Winter Recreation Area (A-11) Land Allocation. The Decision Notice was also signed in FY99. A design review team began meeting in FY99 regarding the proposed demolition of the current pool and non-historic dormer, and replacing these non-historic features with an expanded facility which will include an exercise/sauna/lounge underneath the new pool deck. A food service will be added on the pool deck. A barrier free lift is also proposed to be added inside the lodge to access these new facilities. The project is still under review in FY2000.

Cloud Cap Inn on the Hood River District received a new deck and storage room. The Crag Rats, the permittees who use the Inn, received a \$45,000 grant from the Meyer Trust, matched by \$5,000 from SHPO and another \$5,000 from the Forest. Although no formal consultation was completed, SHPO was involved in the design review. An MOA with the State Historic Preservation Office regarding the operation maintenance, and preservation of Cloud Cap Inn, is still in use.

The majority of the Forest’s historic administrative structures were built during the Depression-era (1933-1942) and are under the Depression-Era Management Plan. Maintenance and repair work on these buildings is reported in the Summary Report below. There is a discrepancy between the “Number” of projects and “Project Effect” because not all projects were reviewed for their effect on the historic buildings. While all the work appears to have had “No Effect,” they must be reviewed by the District Archaeologist to determine what level of consultation with the State Historic Preservation Office is required.

Table 10. CCC Historic Structure - Summary Report

Type of Project		Number	Project Effect		
			No Effect	No Adverse Effect	Adverse Effect
1	Minor repairs/routine maintenance.	47	10		
2	Replace wall or roof materials, in-kind.	0	0		
3	Replace wall or roof materials, not-in-kind.	0			
4	Repair or replace windows or doors, in-kind.	0			
5	Replace windows or doors with new features different in size, design or operation.	0			
6	Repair or replace secondary structural features; e.g. porches, gutters and downspouts, chimneys, in-kind.	0			
7	Install insulation materials, storm windows or doors.	0			
8	Repaint or refinish interior surfaces.	2			
9	Repaint exterior surfaces.	0			
10	Refurbish areas previously altered; e.g. kitchens or bathrooms; replace nonhistoric flooring or floor covering.	3			
11	Repair/replace mechanical, electrical, plumbing systems.	4			
12	Alteration to building (describe).	0			
13	Addition to building.	0			
14	Removal of building.	0			
15	Other (describe)	0			

Because of reduced facility maintenance budgets, many historic administrative buildings are not receiving adequate maintenance and have not for a number of years. Lead paint, in particular, which was used on most buildings up into the 1970's is now a hazardous material concern and expensive to remove or contain. A Facility Master Plan (finalized in 1999) was prepared to address the impacts of the decreasing budget and which administrative buildings were no longer needed. Until the final disposition of these buildings is determined, very little maintenance will be performed. Allowing historic buildings to deteriorate is considered an "Adverse Effect." Therefore, decisions need to be made soon, in consultation with the State Historic Preservation Office, so that appropriate repairs, maintenance and stabilization are performed on the buildings that will be retained.

While a few other historic buildings such as Timberline Lodge and Cloud Cap Inn are being maintained, many others are not receiving any maintenance or stabilization measures. Options such as placing a building under a special use permit or offering as a cabin rental are being explored.

- Are significant (National Register eligible) sites being nominated to the National Register of Historic Places?

The Bagby Guard Station was nominated to the National Register in September 1999. The last nomination completed was the Barlow Road in 1992. The Cooper Spur Warming Hut nomination documentation work was completed in 1994, including SHPO consultation, but has yet to be submitted. The Timberline Trail had a Draft Nomination prepared in 1989. The work on this nomination should be completed.

- Are cultural resource sites being interpreted for the public?

A variety of interpretation/education activities occurred on and off the Forest in FY99. In partnership with the CRGNSA and Gifford Pinchot National Forest, the Mt. Hood hosted the Windows on the Past Show on September 29 - October 3, 1998, at the World Forestry Center in Portland, Oregon. After a year and a half of planning, the show opened with 28 different exhibits, demonstrations, or living history presentations. The students at the Timberlake Job Corp built the homestead exhibit for the show. Over 5,000 visitors attended the show, including 4,000 school children. Other interpretation activities on the Forest include a living history presentation during Oregon Archaeology Week on the Barlow Road. During five days, about 300 visitors attended. On Memorial Day Weekend, volunteers from the Oregon Archaeological Society assisted on another archaeological project. An artifact analysis training was provided to those OAS members. Frequent tours were conducted at Timberline Lodge along with the interpretive displays that the Friends of Timberline oversee.

- Are cultural resource sites being “condition” checked and maintained on a regular basis?

Several historic buildings and sites such as Timberline Lodge, Silcox Hut, Zigzag Ranger Station, Clackamas Guard Station, and the Barlow Road Historic District receive periodic monitoring. Over 50 archaeological sites were monitored, which is less than 10% of the Forest’s known sites. Most of these are located in high use areas or near proposed projects and are visited year after year. The majority of the sites on the Forest, however, have not been monitored since they were originally recorded, many as early as the 1970s. To monitor some of the most vulnerable sites, the Forest developed a Memorandum of Understanding with the Oregon Archaeological Society (along with the Gifford Pinchot National Forest and Columbia Gorge National Scenic Area), to establish a site stewardship program in FY98. After receiving training, the OAS volunteers were assigned one or more sites to visit periodically and record site conditions. This partnership continued to be successful in FY99 and is expected to be expanded in FY2000.

- Are cumulative effects of forest project activities on cultural resources being tracked and studied?

Currently, there is no systematic tracking or studies of cumulative effects of forest project activities on cultural resources. Avoidance of impacts to cultural resources has been a goal of the vast majority of projects. Therefore, effects of any kind from projects are rare. The Heritage staff do, however, routinely monitor the condition of cultural resources during and after project activities to ensure that the avoidance procedures are followed. No cultural resources were impacted in FY99.

Recommendations

- Evaluate remaining Depression Era and other historic buildings on the Forest for eligibility to the National Register of Historic Places.
- Develop a Forest-wide historic building plan which will include a historic context statement, a summary of National Register evaluations, and direction for disposition of surplus historic facilities.
- Ensure that maintenance and repair work on historic structures is done only after review by the district archaeologist, and, if necessary, consultation with the State Historic Preservation Office. Develop a facilities plan identifying priorities for maintenance and repair.
- Complete the National Register nomination process for the properties that have already been started.
- Develop a site determination of eligibility schedule to reduce the backlog of unevaluated sites.
- Develop a site monitoring schedule to increase the number of sites monitored each year, with emphasis on sites that have not been visited in over ten years.

Monitoring Element: Geologic Resources

Goal

There were seven timber harvest units in FY99 on land mapped as medium or high risk earthflows. All were commercial thins. About 1/3 of the smaller trees were removed to promote more vigorous growth in the remaining trees. The size of the largest three units were 29, 14, and 45 acres. These three units exceeded the unit size limits for B8 land. The canopy closure in all seven units was reduced below 70%, therefore creating an “opening” on earthflow land. It is estimated that recovery to 70% crown closure will occur in approximately 10 years. All of these units were field reviewed and modified slightly by slope stability specialists during the project planning stage. Slope stability specialists determined that the short-term risk of initiating or accelerating earthflow movement was minimal and that the enhanced growth of the remaining trees will have a positive long-term effect on earthflow stability. Timber harvesting guidelines in the Forest Plan were designed for clearcut harvest units and no specific guidelines exist for other types of harvest methods. No roads were constructed on B8 (earthflow) land.

One commercial thin timber harvest unit occurred on mapped landslides other than B8 land in FY99. This unit was not field reviewed by any slope stability specialists before harvest. The area involved was not recognized during project planning as containing a previously mapped landslide. Locations of mapped landslides are available to project planners on GIS maps and should be checked early in the planning stage. Any proposed timber harvest units that overlap or are near mapped landslides or earthflows should be field reviewed by forest slope stability specialists. No roads were constructed on mapped landslides other than earthflows.

Recommendations

- Additional efforts in 2000 should be focused on continuing the on-the-ground monitoring of the earthflows to enlarge our baseline data to enable the evaluation of future changes due to management activities, continuing the review of the risk classification system for earthflows, and continuing the field verification of the earthflow and landslide boundaries.
- Continued measurements during FY00 at established earthflow monitoring stations will provide valuable information to guide future management activities on earthflows. These measurements are primarily for slope movement rates. Much additional effort is still needed in verifying the scientific validity of the standards and guidelines for earthflows, particularly those covering hydrologic recovery.

Monitoring Element: Mineral Resources

Goal

There were no commercial leasable or locatable mineral development activities on the Mt. Hood National Forest in FY99. Locatable mineral activities were limited to minor sampling and exploration on the Forest. Forty Notice-of-Intents were submitted to the Forest. In all cases the planned activity was limited to mineral exploration. There were 25 inquiries from the public regarding laws and guidelines covering locatable minerals on National Forest managed lands. The Forest responded to 100% of these inquiries.

Most of the minerals activity on the Forest was with salable (common variety) mineral resources. These resources were managed using the Mt. Hood National Forest Rock Resource Plan as a guide. There were 3 major projects where 76,232 cubic yards of mineral materials were used by another government agency. There were 17 major projects where a total of 50,500 cubic yards of mineral materials were used by the Mt. Hood National Forest. All of the major projects had operating plans and were field inspected for compliance with the plans. 100% of the transportation plans were reviewed. When necessary operating plans were modified to adjust to changing conditions. Operators were not allowed to leave the source until all the requirements of the operating plan had been met. During FY99 there were 17 operating plans completed for current and future projects. Six small quarries were closed and restored.

There were 40 smaller projects (less than 500 cubic yards each) where salable mineral materials were used by the Mt. Hood National Forest. No operating plan was required for these projects. These projects removed a total of 6300 cubic yards.

There were 536 smaller projects where salable mineral materials were used by the public. These projects removed a total of 350 cubic yards. These projects produced an insignificant level of surface disturbance and therefore did not require an operating plan.

All the mineral activity took place in currently developed and designated common variety mineral material sources in a manner that did not conflict with other resource objectives. Not all the existing sources have completed formal long range

development plans. No new development plans were completed, although several remain nearly completed.

Recommendation

- For next year, additional efforts should be focused on completing more development plan for our primary common variety mineral material sources. In addition, many of our sources are being depleted of the easily accessible loose material by the continuing demand for “landscape rock” by the public.
- An effort needs to be made to inexpensively create additional loosened material at those sources to meet the public demand for small quantities of salable mineral materials.

Monitoring Element: Fish Resources

Goal

The goal of the fishery program is to maintain or increase fish habitat capability and assure long-term aquatic ecosystem health.

Our GIS stream layer indicates there are 6,400 miles of streams on the National Forest. Approximately 1,600 miles are inhabited by fish. There are also over 100 lakes with fish. Mt. Hood National Forest waters support 24 fish species, including salmon, steelhead and trout. Fish resources on the Forest are an important contributor to local and regional recreational, commercial and tribal fisheries.

The waters of the Mt. Hood National Forest provide important habitat for native populations of fish. Table 11 displays the five salmon and trout species presently or proposed for listing under the federal Endangered Species Act.

Table 11. Status of Threatened or Endangered Fish on Mt. Hood National Forest in 1999

Species	Evolutionary Significant Unit Status
Chinook Salmon	Listed Threatened Lower Columbia River ESU 3/99 Listed Threatened Upper Willamette River ESU 3/99
Coho Salmon	Candidate Lower Columbia River/ SW WA ESU 7/95
Steelhead	Listed Threatened Lower Columbia River ESU 3/98 Listed Threatened Middle Columbia River ESU 3/99
Coastal Cutthroat Trout	Proposed Listing Southwest WA/Columbia River ESU 3/99
Bull Trout	Listed Threatened Columbia River Distinct Population Segment 5/98

Spawning and Redd Counts

Spawning and redd surveys for steelhead, salmon and bull trout were completed in 23 streams totaling 38.7 miles. Surveys are usually completed along predetermined index reaches that are surveyed yearly to show spawning trends and fish distribution. Some surveys were done with partners, including the Oregon Department of Fish and Wildlife and the Confederated Tribes of Warm Springs Reservation.

Key findings include:

Middle Columbia River Steelhead

Nineteen miles of winter steelhead surveys were completed in index reaches of the Miles Creeks basin. Three of the five streams surveyed in the Miles Creek basin had redds for a total of 31 redds. All documented steelhead redds were associated with edge habitat or pool tail areas. Oregon Department of Fish and Wildlife saw an increase in number of redds in index reaches on adjacent private lands and there appears to be a stronger spawning run in 1999.

Lower Columbia River Chinook

Redd surveys for spring chinook have been conducted in an 1.5 mile long index reach of West Fork Hood River since 1992 in partnership with the Confederated Tribes of Warm Springs. Numbers of redds have varied greatly from a high of 38, to a low of 0. In 1999 one redd was found in the Forest Service index reach. Numbers for all Hood River surveys have not yet been finalized.

One index reach totaling 3.3 miles was surveyed in Still Creek, a tributary to the Zigzag River in the Sandy watershed. 33 redds were observed averaging 10 redds per mile. Average redd density has been 31 redds per mile. This is the lowest numbers observed since 1989. On the Salmon River, another tributary to the Sandy River, three index reaches totaling 13 miles were surveyed. A total of 219 redds were counted. This is the lowest number since surveys began in 1996. In the past 34% of all chinook migrating over Marmot Dam were observed in the Salmon River. In 1999 only 3% were observed in the Salmon River.

Columbia River Bull Trout

Segments of the Middle Fork of the Hood River and tributaries are surveyed annually for distribution of spawning and rearing bull trout. This information is also used to detect population trends. Surveys have been conducted in upper Clear Branch, lower Clear Branch, and Pinnacle Creek since the early 1990's. In 1999 eight additional tributaries were surveyed to locate additional spawning or rearing areas. The new locations are Bear Creek, Eliot Branch, Lake Branch, Tony Creek, Middle Fork of the Hood River, and Compass Creek. To adequately document presence of juveniles and adults day and night surveys continued to be conducted. Index reach monitoring (data represent single highest count for the year) for bull trout found:

	Upper Clear Branch	Lower Clear Branch	Pinnacle Creek
1991	10 (partial survey)	2	not surveyed
1992	19	2	not surveyed
1993	37	2	not surveyed
1994	6	2	not surveyed
1995	5	1	1
1996	18	0	0
1997	20	3	1
1998	30	0	1
1999	4	0	1

The low number of adults censused in 1999 was a surprise since a night survey done a week earlier counted 57 adults. We believe adults may have spawned and moved out of Clear Branch before the adult census occurred and there was an undercount of spawning adults.

Compass Creek is a tributary to lower Clear Branch. For the first time a juvenile bull trout was found indicating spawning may occur in Compass Creek. However, numbers continue to remain low. The average is 2-3 fish censused over 1.25 miles of survey.

Surveys for bull trout redds occur in early October in index streams Lower Clear Branch and Bear Creek. Numbers continue to be low, with one redd in Lower Clear Branch (the first since 1992) and two redds in Bear Creek. This is the first documented use of Bear Creek by bull trout.

Coastal Cutthroat Trout

Spawning surveys for coastal cutthroat trout in tributaries of Bull Run Lake have been ongoing since 1993 (the year after a severe summer drought and lake elevations dramatically dropped). Number of redds have varied from 86 to 512. In 1999 one-half mile of stream was surveyed on five tributaries and 86 redds were found.

Shoal spawners, cutthroat trout spawning in shallow waters of Bull Run Lake, have also been monitored since 1993. Number of shoal spawners have ranged from two to twenty six. In 1999 twelve shoal spawners were counted. Numbers of redds have varied from one to seventeen. In 1999 eight redds were counted.

There are many environmental factors affecting cutthroat populations. One factor appears to be lake elevation. The amount of large organic debris available as cover, rearing habitat and cutthroat food sources may decrease as the lake elevation is lowered. Lake elevations have increased during spawning season since 1993 and passage to tributaries has also improved, compared to the 1992 draw down.

Stream Surveys

The Forest-wide riparian (stream) survey inventory program completed 49 miles. Large wood and pool frequencies were compared against Land and Resource Management Plan (LRMP) standards. Of the 49 miles, 4.8 miles met the large wood standard and 5.9 miles met the pool standard. None of the miles met both standards. LRMP standards do not appear to reflect the range of natural conditions for streams of the Mt. Hood National Forest.

Hood River Upper Limits Surveys

Fourteen tributaries on three stream systems on the Hood River Ranger District were surveyed for flow classification (ephemeral/intermittent/perennial), potential for fish passage at culverts, and upper limit of fish distribution. Surveys followed Oregon Department of Fish and Wildlife protocol for upper limit of fish distribution. Stream and their tributaries completed in 1999 included North Fork Mill Creek (including nine unnamed tributaries and two headwater forks), West Fork Neal Creek (including two headwater tributaries) and Mosier Creek.

Barlow Upper Limits Surveys

In 1999 Barlow Ranger District was one of three ranger districts in Region 6 to conduct a pilot survey for a new methodology evaluating passage of juvenile fish at road/stream crossings. Thirty nine streams were inventoried on the Barlow Ranger District for flow classification, potential for fish passage at culverts and upper limit of fish distribution. Major streams, their tributaries and resource planning areas inventoried include Mill Creek, Stroud planning area, Mill Creek Buttes planning area, Eightmile planning area, Marion planning area, and Jordan Creek. Information was entered into the Barlow Geographic Information System. Riparian Reserve widths have been updated on digital maps.

Of 38 road/stream crossings evaluated only three culverts rated as passable for all life history stages of fish. Half of all stream crossings were rated as inadequate, and 11% require further evaluation.

Hood River and Barlow Ranger Districts Stream Shade and Sediment Studies

On the Hood River Ranger District paired studies evaluating stream shade were completed along four streams within two planning areas, Polallie/Cooper and Bear Knoll. Objectives of the monitoring are to evaluate impacts of vegetation management in riparian areas on stream temperatures. In 1999 baseline, pre-treatment information was collected, and future monitoring will evaluate changes in stream temperature and tree growth.

Validation of stream shade standards reported in Ramsey Creek watershed analysis were completed in 1999. Using Badger Creek as an analog reference stream, shade percentages are reported in Table 12.

Table 12. Stream Shade Evaluations in Pine/Oak Vegetation Types

	Watershed Analysis Recommendation	1997 Measured Stream Shade Percentage	1999 Measured Stream Shade Percentage
Lower Badger Creek	30-50%	70%	68%
Lower Ramsey Creek	30-50%	n/a	47%

Sixteen streams on the Hood River Ranger District were evaluated for stream sediment levels. Two locations were replications of surveys completed in 1995. Results are still being evaluated.

Badger Creek Monitoring

The Badger Creek wilderness stream monitoring program continued in 1999. There is a headgate structure on the stream diverting water into Highland Ditch for irrigation. Several ditch failures/breaches have occurred the past few years depositing large pulses of sediment and organic matter into Badger Creek and the riparian area. The goal of the monitoring program is to assess overall impacts of the diversion structure. Measurements taken in 1999 reveal 67-69% of the flow of Badger Creek is being diverted into the Highland Ditch.

Lake Surveys

The survey of Laurance lake completed in 1998 was repeated in 1999. Still no final reports have been received.

Stream Habitat Restoration Effectiveness Monitoring

Stream habitat restoration continues to be a major program of work for the fisheries program. Table 13 lists the monitoring completed of different stream habitat restoration projects in 1999 across the Mt. Hood National Forest.

Table 13. Stream Habitat Pre- and Post- Project Monitoring

Project Name	Objective	Monitoring Objective	Monitoring Method	Results
Rock Creek	restore riparian and in stream complexity	pre-project stream & side channel habitat baseline	longitudinal profile, permanent cross-sections	
Fifteenmile Creek	restore in stream habitat complexity	post-project evaluation	review of result of high flows	some structure mobilization
Upper Clear Branch	improve in stream habitat complexity	pre-project stream & side channel baseline	habitat type project area, fish surveys	
Lower Clear Branch	restore in stream habitat complexity	pre-project fish populations, fish habitat, post-project spawning gravel quality	fish surveys, longitudinal profiles, permanent cross-sections, photo points	> spawning gravels, < fine sediment
Ramsey Creek	restore riparian and in stream complexity	pre-project stream & side channel habitat baseline, streambank stabilization	site map, streambank pins, permanent cross-sections, discharge	
Hot Springs Fork, Oak Grove	restore side channel access and function, main channel habitat	pre-project in stream and riparian habitat, channel morphology	photo points	
Fish Creek	restore in stream habitat complexity, side channels	post-flood channel changes	repeat 12 stream channel cross-section profiles, establish photo points	no significant change since 1996
Zigzag River & tributaries, Salmon River	restore in stream habitat complexity, side channels	post- Jan 1999 flow event channel changes	retake photo points, repeat habitat mapping	
Upper Sandy River	restore in stream habitat complexity, side channels	pre-project in stream and riparian habitat, channel morphology	re-shoot 1994 photo points, establish new photo points, site map	

Structure Durability and Function

No structure durability and function surveys were conducted during FY 1999 on the Forest.

Aquatic Invertebrate and Mollusk Surveys

The Northwest Forest Plan identified aquatic mollusk species to survey and manage in the Record of Decision. Two species are known to be present on the Mt. Hood National Forest, Columbia dusky snail Lyogyrus spp and basalt juga Juga oregobasis. Surveys completed in 1999 are summarized in Table 14.

Table 14. Aquatic Mollusk Survey and Manage Results

Ranger District	Columbia dusky snail (<u>Lyogyrus spp</u>)		basalt juga (<u>Juga oregobasis</u>)	
	Number of Sites Surveyed	Number Found	Number of Sites Surveyed	Number Found
Hood River	13	3	13	0*
Barlow	25	7	25	3*
Clackamas River	25	1	25	0
Zigzag	8	1	8	0

*Possible new species found, in laboratory for positive identification.

Conclusions

Overall, indicators of numbers of anadromous fish (such as redd counts) continue to be low. Amount of available habitat is much greater than occupation by fish. Restoration of habitat is important so when fish are present chances of survival are maximized. For example, Ramsey Creek had the highest density of winter steelhead redds (4.4 per mile) and stream habitat restoration efforts planned for 2000 are appropriate and beneficial.

Bull trout life history information and numbers continue to fluctuate. Survey areas were expanded in 1999 and a small number of bull trout were found in the new survey areas. Monitoring of the gravel restoration project in lower Clear Branch, below the Laurence Lake dam, and the habitat restoration of upper Clear Branch planned for 2000 will continue to improve in stream conditions for bull trout.

Numbers of redds and adult spawning spring chinook on the Salmon River were down in 1999. This may be attributed to:

- a larger percentage of spawners outside the 1999 survey reach,
- an increase in pre-spawning mortality, or
- undercounting of redds in where multiple pairs of fish might spawn.

Riparian surveys continue to demonstrate that few streams meet the LRMP pool or large wood standards.

The stream/crossing protocol now being tested may have consequences on future road management. It will be important to set priorities of highest need for fish passage if significant numbers of culverts are not meeting passage requirements.

Percent of flow (67-69%) diverted from the Highland Ditch may be significant.

Mollusk surveys are in their infancy. Lyogyrus spp. may be more common, and Juga oregobasis may be more rare than first believed. Careful tracking of habitat when a species is found will help identify future high probability areas of occupation. Positive identification of Juga species in contract laboratories by qualified personnel has been slow and expensive.

Recommendations

- It is timely to review the lake survey program. All lakes on the Mt. Hood NF were inventoried during the 1990's and a status review of the lake survey program is warranted.
- Recommended amount of stream shade percentage for Pine/Oak vegetation type riparian areas on the east side of the Forest needs further evaluation.
- Continue evaluation and effects of diversions from the Highland Ditch.
- Continue to evaluate methodology for monitoring bull trout (i.e. timing of adult surveys). Bull trout life history is complex, highly variable and difficult to monitor.
- Watershed wide programs are important for fish habitat and fish recovery. For example, surveys of bull trout in the Middle Fork of Hood River, in conjunction with habitat restoration and monitoring of habitat restoration, help land managers to focus limited resources to areas of greatest effectiveness.
- During revision of the LRMP stream habitat standards should be re-evaluated based on ten years of thorough and comprehensive stream surveys.
- Small mouth bass have been found below Laurence Lake dam. Monitoring of invasion of non-native and exotic species is important and should continue.
- Surveys in Bull Run Lake will help us better understand the relation between lake elevations and cutthroat trout production.

Monitoring Element: Water Resources

Goal

A key goal of the Mt. Hood Forest Plan is to protect and maintain the character and quality of water, providing for long-term sustained production resulting in favorable flows from the watersheds on the Forest. In addition, the unique and valuable characteristics of floodplains, riparian areas, and associated riparian and aquatic ecosystems are to be protected.

The purpose of various water resource monitoring activities is to assess Forest Service compliance with the Clean Water Act, as outlined in a Memorandum of Agreement with the State of Oregon. Water quality Best Management Practices (BMPs) and related Forest Plan Standards have been developed to achieve compliance with the Clean Water Act and state water quality regulations. The objective is to meet Federal Designated Management Agency obligations and responsibilities (under the Clean Water Act) with respect to nonpoint source pollution control.

Forestwide Monitoring Activities

Forestwide, water-related monitoring activities are summarized in this document.

Bull Run Monitoring Activities

Bull Run Watershed monitoring has been developed over the years to provide an effectiveness assessment of water quality protection. Federal standards which have been developed to comply with PL 95-200, known as the Bull Run Management Act, were designed to characterize the very high quality of waters from the Bull Run watershed and are considerably higher standards than stream standards applied elsewhere, i.e. Oregon Administrative Rules for streams.

Key Station monitoring which provides baseline water quality and quantity information at the four principal streams which flow into the reservoirs and at Headworks is being completed by the City of Portland Water Bureau. Current water quality and quantity at the Key Stations are compared to historical standards.

Forest Service monitoring activities within the Bull Run Watershed focused on monitoring the effects of specific projects on water quality. For water year 1999 monitoring projects were implemented for the Falls Creek Stream Stabilization Project and the Bull Run Road Decommissioning Project.

Forestwide Monitoring

Forestwide, two broad categories of water resource monitoring were carried out during the past year:

Implementation Monitoring is directed at assessing whether the Forest Service is “doing what we said we would do”, i.e. assessing whether specific water quality BMPs and related Forest Plan standards and guidelines were identified, applied correctly (location, design, etc.), and applied in a timely manner.

Implementation monitoring includes office and field reviews of projects for:

- Selection of site-specific BMPs;
- Translation of BMP intent and content into project contract provisions or administrative control language; and
- Implementation of BMPs in the field as specified in the NEPA document and other administrative direction.

Implementation monitoring for timber harvest and road construction activities also includes regular inspections made by timber sale administrators and/or engineering representatives.

Effectiveness Monitoring is undertaken to assess whether applied BMPs and Forest Plan Standards are effective in maintaining water quality. Monitoring techniques, sampling design, and monitoring frequency are varied. Examples of effectiveness monitoring include:

- Observing the effectiveness of BMPs designed to prevent/minimize the off-site movement of sediment and debris from an activity area into a stream channel; and
- Observing the effectiveness of waterbar spacing and construction for preventing erosion off a skid trail.

Implementation Monitoring

Best Management Practices (BMPs)

BMPs are those practices used to achieve compliance with State water quality standards and protect the beneficial uses of water. Post-project monitoring was done using the Best Management Practices Evaluation Process (BMPEP) for a limited number of projects.

Visual observation was the predominant method used by watershed specialists to monitor the implementation and effectiveness of BMPs during 1999. In several instances, monitoring was accomplished during site visits intended for purposes other than monitoring. Additional BMP implementation monitoring is routinely carried out by timber sale administrators and/or engineering representatives.

Barlow Ranger District

The focus for BMP monitoring on the Barlow District this year was grazing allotments. Both the White River Allotment and the Badger Allotment were monitored for adequacy of planning documents (Environmental Assessments (EA's), Allotment Management Plans (AMP's), and Annual Operating Plans (AOP's) in protecting beneficial uses of water. Range EA's and AMP's are not done for either allotment, but are scheduled for 2002. Both allotments met direction, standards, and guidelines in the Mt. Hood Forest Plan and the Northwest Forest Plan as well as meeting the intent of BMP's. Additionally, the standards and guidelines were effective for adequately protecting the beneficial uses of water.

Several site visits were made to the Owl Quarry underburn to monitor for BMP's, Mt. Hood Forest Plan and ACS compliance as the project was being implemented. Approximately 5 acres of the 200 plus acres that were burned did not meet objectives. A site visit was made to the Highland Fire to evaluate the need to mitigate suppression damage; none was needed.

An interdisciplinary field review was conducted on the Owl Quarry Timber Sale and the Fifteenmile Flood Restoration Project after these projects were completed. Overall, these projects were implemented as stated in the planning documents and were effective in meeting the project objectives and protected water quality.

Clackamas River Ranger District

BMP Implementation and Effectiveness Monitoring

Timber Sales

Eighteen units were monitored using the Best Management Practices Evaluation Process (BMPEP) in 1999. The units represented 7 timber sales originating from 4 Environmental Assessments (EA's) and one Environmental Impact Statement (EIS). Nine of the units monitored were commercially thinned, seven were shelterwoods, and two were regeneration cuts with 15% green tree retention.

Of the thinning units, five were harvested using skyline systems, two were harvested with helicopters, one was harvested with ground-based equipment, and the last was harvested using a combination of ground-based and skyline systems. Four of the shelterwoods were harvested with helicopters, two were harvested with ground-based machinery, and the remainder were harvested using a skyline system. Both of the regeneration units were logged using ground-based machinery.

Five different BMPs were monitored, with up to 4 being monitored in any one unit. In some instances, only one BMP was monitored. All the BMPs monitored were associated with riparian reserve and no-cut buffer widths, yarding and skidding specifications, landings and roads. The most common BMP monitored was the width of riparian reserves. Of the 18 units, riparian reserve widths were monitored on 12 units, landings were monitored on 11 units, yarding suspension requirements were monitored on 8 units, and skidtrails were monitored on 4 units. A total of 44 BMPs were monitored on the 18 units.

Of the 44 BMPs monitored, 39 (89 %) were implemented as planned. Of those, there was one (2 %) instance where a relatively minor degree of resource damage was observed. A minor degree of resource damage is defined here as a condition that is not deemed widespread over a large area, rather it is confined to a relatively small site. Three (7 %) other BMPs were implemented with a minor deviation from the original plan, however, there was no observable environmental consequence. There was one (2 %) BMP that was not implemented as planned in which an improved level of resource protection was achieved.

There were two instances in which riparian reserve widths were narrower than originally stated in the associated National Environmental Policy Act (NEPA) analysis file. Both Morgan units 8 and 9 had buffer widths that were less than the 100 feet stated in the documentation. In all cases, however, there was no resource damage or subsequent sediment delivery. Thus it is inferred that deviations in buffer widths in these instances were inconsequential.

In one unit, Beagle 27, there was a departure from the treatment of a temporary road designated to be obliterated by the purchaser upon completion of logging. It was planned that the surface of the obliterated road would be covered with a standard erosion control application straw mulch, grass seed, and fertilizer. The purchaser was, upon request, allowed to cover the obliterated surface with a suitable amount of slash. Departure from the original plan still amounted to satisfactory resource protection.

The single BMP that was not implemented as planned involved the placement of a temporary spur road to the top of Morgan unit 8. Originally, the road was anticipated to cross a wet seep that marked the headwaters of a small ephemeral stream. This would have required following BMPs that would protect the stream from adverse impacts from construction and spur road use. However, the road was constructed further uphill along ground that was more gentle. Consequently, the road did not cross the wet seep or ephemeral draw, therefore stream protection BMPs were not necessary.

The single instance where a BMP was implemented yet resource damage still resulted included an access road to Beagle units # 27 and # 28. Currently, the surface of a non-system spur road constructed to provide access to Beagle units 27 and 28 is in poor condition from rutting and surface erosion, and a moderate degree of sediment production has occurred. It appears that off-road vehicle (ORV) use during wet periods is the primary reason. An earthen and boulder berm that blocks the entrance to the spur has been breached, and ORVs can be driven around the end of the barrier. Consequently, traffic use has occurred during wet periods, resulting in damage to the road tread. There are pronounced ruts in the tread that channel and concentrate waterbars that were constructed on the surface have been damaged. To date, maintenance of the access barrier had not occurred, and users continue to gain access to the site during wet conditions. Because there are no stream crossings, there was no observable sediment delivery to a water source. Overall, the impact on soil and water resources is judged to be minor in extent and effect. The condition will continue however, until an improved barrier is constructed or the road is obliterated entirely.

Overall, most of the timber sale BMPs monitored were prescribed and implemented as planned. The result is effective protection of soil and water resources in most instances. Of the 18 units monitored, no striking or serious adverse impacts to soil and water resources were observed.

Road Restoration

Five road obliteration projects were monitored in 1999. All sites were non-system spur roads originally created in 1989 to allow machinery to access fish rehabilitation projects along the Collawash River. Subsequently, the public used the roads for dispersed camping and recreational activities. The roads were used in 1999 to access the project areas to rework the original fish rehabilitation projects that were damaged in the flooding in 1996. The restoration objectives were to obliterate the roads by decompacting the road surface with an excavator, disperse large woody debris as available across the surface, block the entrance, and seed, fertilize, and mulch the disturbed areas.

Three different features were evaluated on the five individual project sites, amounting to 15 different BMPs monitored. The planned project design was the same for all five sites, so the same BMPs were evaluated at each site. All 15 design features (100%) were implemented as planned. However, five of the BMPs evaluated were only partially protecting targeted resources, and some level of resource impact remains despite obliteration of the road. The condition observed was minor and considered temporary, and no adverse impact on water quality resulted.

All objectives were achieved, however seed was not applied until late fall (October). Consequently the grass only had about a month to germinate and begin growing before going dormant. Late seeding did not have time to develop a protective layer before the ensuing wet season. In addition, no mulch was applied, resulting in a lack of effective ground cover. Arrangements to mulch the disturbed areas had been made with a contract Labor Service crew, but did not occur due to their extended firefighting schedule.

In conclusion, the BMPs prescribed for obliterating the non-system spurs are judged to have been largely effective at ameliorating targeted impacts. Effects of a late grass seed application are deemed to be short-lived and relatively minor in magnitude.

Cumulative Watershed Effects Analyses

Forest-wide, existing watershed conditions/cumulative effects were assessed as part of project-level and programmatic Environmental Assessments (EA's) and Biological Evaluations (BE's). The results of this work are documented in each project report (EA or BE) and supporting analysis files available for review at Ranger District offices. The findings are briefly summarized below.

The ARP Methodology in Use on the Forest

One tool often used is the Aggregate Recovery Percentage methodology. The Aggregate Recovery Percentage (ARP) methodology is a tool used to evaluate potential cumulative hydrologic effects related to management activities or natural disturbance factors within a watershed. ARP values provide an index of a watershed's susceptibility to potentially damaging increased peak streamflows resulting from typical rain-on-snow precipitation events. Increased peak flows can have adverse effects on stream channel processes, including accelerated channel erosion and sediment deposition. The methodology is based on the premise that created openings in the forest cover increases snowpack accumulation and the risk of rapid snowmelt, leading to increased runoff during a rain-on-snow event.

Higher ARP values are indicative of a watershed which is hydrologically recovered and at relatively low risk to the adverse effects of increased peak flows. Conversely, lower ARP values are indicative of a watershed which is at relatively higher risk. The Mt. Hood National Forest Plan has established varying ARP threshold of concern (TOC) values for each major watershed on the Forest, ranging from 65% to 82%. These vary according to a watershed's inherent sensitivity to the adverse effects of peak flows and significant water resource values (anadromous fish, domestic water supply, etc.) identified for the watershed during forest planning.

For the west side of the Cascades, an area is considered to be hydrologically recovered when the forest cover is equivalent to a coniferous forest having more than 70% crown closure and an average tree diameter (DBH) of 8 inches or greater.

The ARP methodology has also been refined for the Eastside of the Mt. Hood National Forest, to better adapt the methodology to eastside forest conditions. East side crown closure requirements vary by vegetation type, based upon expected natural crown closures for a healthy forest ecosystem, where lower densities and natural openings are expected.

The ARP methodology has been refined so that the cumulative effect of various partial cut (thinning, etc.) prescriptions can be evaluated. Various forms of partial cutting constitute a major component of current and proposed timber management.

In recent years, many watershed specialists, researchers and practitioners have cautioned against the adoption of specific watershed thresholds of concern, since an absolute threshold cannot be identified considering the incredible physical and vegetative variability in wildland watersheds. While they serve as useful indicators of relative risk, calculated ARP values do not always reflect all of the relevant factors which should be considered in a cumulative effects analysis.

Comprehensive watershed analysis documents prepared to date for lands administered by the Mt. Hood National Forest often use, as appropriate, additional tools to assess watershed condition and response to management. These include, but are not limited to, assessments of stream channel network expansion due to roads (related to increases in the magnitude and frequency of potentially damaging peakflows), assessment of sediment source areas and contribution to streams, and geologic stability assessments, etc. Similar methodologies have also been used to varying degrees in watershed assessments associated with project planning, providing additional insight into the hydrologic function and condition of watersheds.

Barlow Ranger District

ARP was calculated for the existing condition for the Bear Knoll Timber Sale on the Hood River District; it met Forest Plan standards. Several project proposals were reviewed for cumulative effects, ACS compliance, Mt. Hood Forest Plan compliance, BMP compliance, and impact to water quality limited streams. Snow plowing on Con 1 and 3, LP Salvage, Path Swisher Ditch fish screen, and the FY99 Restoration projects all met or were modified to meet compliance with the above.

Clackamas Ranger District

ARP analysis was conducted on five watersheds during FY 1999. The analysis was used in the preliminary planning of five timber sales. ARP values were obtained for Upper South Fork of the Clackamas River, Poop Creek, Last Creek, Shellrock Creek, Upper Collawash, Whiskey Creek, Bedford Creek, and Dry Creek subwatersheds. Hydrologic standards were met for all planned projects. All ARP values met the threshold of concern of 65% for cumulative effects within watersheds as required in the Mt. Hood LRMP.

Hood River Ranger District

Cumulative effects analyses (ARP) were completed, as part of a formal planning process, for 3 projects, including the Bear Knoll planning area, Mill Creek Planning area, and Clear Planning area. Summaries from each planning area are presented below:

Clear Planning Area

The threshold of concern that has been used for westside Cascade watersheds in the Hood River Ranger District is 75%. In the Coe and Eliot Branch watersheds, the ARP value is well above the threshold of concern. In the Crystal Springs watershed, the ARP value is approximately at the threshold of concern, yet on USDA Forest Service-managed land it is below the threshold of concern. In the Evans Creek watershed, the threshold of concern is significantly below the threshold of concern, yet on USDA Forest Service managed land it is approximately at the threshold of concern.

Table 15. ARP Results by Watershed, Rain-on-Snow Zone

Watershed	USDA Forest Service	non-USDA Forest Service	Total Watershed
Evans	74.3	43.9	52.6
Crystal Springs	61.7	76.8	74.1
Coe Branch	88.6	—	88.6
Eliot Branch	89.6	—	89.6

Mill Planning Area

In all three watersheds analyzed, the ARP value is above the threshold of concern on USDA Forest Service-managed land, yet below or at the threshold of concern on other ownerships. The USDA Forest Service-managed land encompasses the headwaters for all three watersheds and contains the largest blocks of fully-recovered land. As of the date of 1994, the date of the NRCS aerial photos for non-USDA Forest Service land, the timber harvesting in this area was active. There is no data for subsequent years. Based on existing economic trends and the mature age of the existing recovered land in this basin, it is wise to assume that timber harvest is continuing in this basin. On a recent low elevation flight over this area it was confirmed that this harvest is still active. The estimated annual private timber harvest assumed here for North Fork Mill is approximately 20 acres / year, all in the dry grand fir zone.

In the West Fork Neal Creek watershed the hydrologic recovery on USDA Forest Service land is above the threshold of concern at 72.6%. The ARP value for non-USDA Forest Service land is below the threshold of concern at 54.1%. An active timber harvest by Hood River County and perhaps by other land owners here indicates that the hydrologic recovery for this watershed, for the foreseeable future, will remain below the threshold of concern regardless of management on National Forest land. The ARP value for the entire watershed is 63.2%, slightly below the threshold of concern.

A similar pattern exists in the Mosier Creek watershed, with the ARP value on the USDA Forest Service land being higher at 83.4% and significantly lower on non-USDA Forest Service land at 46.1%. The ARP value for the entire watershed is 51.6%, well below the threshold of concern. An annual timber harvest of 136 acres is assumed for the non-USDA Forest Service land.

Though much of the North Fork Mill Creek watershed does not contain closed canopy forests, it is nonetheless hydrologically recovered. This watershed encompasses a substantial amount of exposed rock, scarp land, and meadows, especially on south-aspect slopes. This type of land is considered fully recovered. The portion of this watershed on USDA Forest Service-managed land is considered 91.3% recovered, while for other ownerships, the ARP value is at 68.3%. The value for the entire watershed is at 84.5%, well above the threshold of concern. An annual timber harvest of 20 acres is assumed for the non-USDA Forest Service managed land.

Table 16. ARP Results by Watershed

Watershed	USDA Forest Service	non-USDA Forest Service	Total Watershed
West Fork Neal	72.6	54.1	63.2
Mosier	83.4	46.1	51.6
North Fork Mill	91.3	68.3	84.5

Bear Knoll Planning Area

Watershed impact area was evaluated for the project area the associated sixth field subwatershed, and the fifth field watershed (as per Forest Plan directions).

Based on current stand conditions and implementation of the alternatives the watershed impact area for the Bear Knoll planning area, the Clear Creek subwatershed and the White River watershed were assessed. Based on current information activities associated with the implementation of the proposed action, Osprey planning area and Hilynix planning area were assessed.

Table 17. Watershed Impact Area (Percent of the Area Assessed in a Hydrologically Disturbed Condition)

Analysis Area	Alternative 1	Alternative 2	Alternative 3	Forest Plan Standard
Bear Knoll Planning Area	31	27	22	35
Clear Creek Subwatershed	26	25	24	35
White River Watershed	28	28	28	35

All alternatives meet Forest Plan standards for watershed impact area for the planning area, Clear Creek subwatershed, and the White River Watershed.

The NW Forest Plan calls for the distribution of land use activities, such as timber harvest or roads, to minimize increases in peak streamflows. Since all the alternatives meet the Forest Plan Standard for watershed impact area it is assumed that there will be minimal increases in peak streamflows associated increased snow accumulation and melt in created openings.

Effectiveness Monitoring

Water Temperature Monitoring

Barlow Ranger District

Thirty seven stations were monitored in the White River, Mile Creeks, and Mill Creek watersheds. Six sites exceeded the 7 day average maximum standard of 17.8 degrees C.

Rock and Gate creeks at the Forest Boundary reached a 7 day average maximum water temperature of 18.8 and 18.3 degrees C. respectively. These streams are still experiencing the effects of the 1973 Rocky Burn and subsequent harvest and grazing activity. Since 1993, streamside vegetation recovery has cooled these streams about 5 degrees.

Ramsey Creek at the new Forest Boundary exceeds state standards with a 7-day average maximum water temperature of 20.6 degrees C. This can be attributed to tree removal and channel modification that occurred prior to the Forest Service acquiring this area.

Badger Creek below the Badger Lake dam in the Badger Creek Wilderness reached a 7 day average maximum water temperature of 18.6 degrees C. The dam is an overflow spillway that draws water off the top of the lake; this coupled with the large surface exposed to solar radiation probably explains these high temperatures. Badger Creek cools to a 7 day average maximum water temperature of 14.7 degrees C by the time it reaches the Forest boundary.

Two sites at Camas Meadow had the highest recorded 7 day average maximum water temperatures on the District (29.3 and 28.4 degrees C). These 2 sites exceed the state standard throughout the summer meeting it toward the end of September. Less than 3 miles downstream at the confluence with Clear Creek the 7 day average maximum water temperature dropped to 11.9 degrees C, due to the possible existence of cold springs in the area. Camas Prairie is a naturally warm wet meadow. One of the first records of its existence was made during the Abbott Expedition through the area in the mid-1800's. The western spotted frog (*Rana pretiosa*), a sensitive species on the Forest Service's R-6 List, is found in Camas Prairie. This is one of the few populations that exists in the Oregon Cascades. Its habitat requirements include warm marshes with water temperatures between 20 and 35 degrees C, with few or no cold springs. The Camas Prairie population is currently the subject of research at Oregon State University.

Clackamas Ranger District

Following the 1996 floods stream temperature data was collected at 16 locations in the Fish Creek watershed 1997-1999. The highest 7 day average maximum water temperature was 22 degrees C degrees between July 22 and July 28, 1998 at Third Creek at the confluence with Fish Creek. The maximum temperature recorded was 23.2 degrees C at this same site July 29, 1998. Third Creek was one of fourteen tributary channels delivering woody debris and sediment to Fish and Wash Creeks following the 1996 flood events. Monitoring stations at the mouth of Fish Creek were vandalized in 1997 and 1998, so the only records since the flood at that station are in 1999. The table below summarizes the 7 day average maximum water temperature at various monitoring stations in the Fish Creek watershed.

Table 18. Summary of 7-Day Maximum Water Temperature

Location	Size of Subwatershed (acres)	Debris Flows During Floods?	1997	1998	1999
Road 5430 bridge	8,454 (lower Fish Creek)	Yes, six tributaries	18.3° C	18.3° C	16.6° C
Second Creek			19.6° C	n/a	17.3° C
Third Creek	1,623	Yes	21.1° C	22.0° C	19.5° C
Wash Creek	5,702	Yes	19.1° C	19.9° C	18.9° C
Pick Creek	2,055	Yes	18.9° C	19.9° C	18.3° C
Fall Creek	1,198	Yes	18.2° C	n/a	17.5° C
Mouth of Fish Creek (trap site)			n/a	n/a	19.2° C
Upper Fish Creek	9,128	No	n/a	14.5°C	14.0°C
Music Creek	1,622	No	14.6°C	n/a	14.9°C

Across the watershed impacts of the floods to stream temperature are summarized as follows:

- In Wash Creek temperatures jump 4 degrees C from the headwaters where there were no tributary debris flows, to the confluence with Fish Creek below several tributary debris flows. The 7 day average maximum water temperature was 18.9 degrees C in 1999 at the mouth of Wash Creek.
- In upper Fish Creek, where there were no tributary debris flows, the 7 day average maximum water temperature was 14.0 degrees C.
- The rate of landslides off roads built before 1968 and tree plantations less than 20 years old was many times higher than that in areas of old-growth. Landslides often failed into stream channels, leaving riparian areas exposed to solar radiation.

Zigzag Ranger District

Zigzag Ranger District: Baseline water temperature data was collected at 15 sites and is summarized in the table below. Water temperature at all sites met the 17.8 degrees C. standard for the 7 day average maximum water temperature.

The Oregon Administrative Rule for the Sandy Basin has established that no water temperature increases from human activities are allowed when the temperature (7 day moving average of the maximum daily temperatures) exceeds 17.8 degrees C., and exceeds 12.8 degrees C. for waters and periods of the year determined by the Oregon Department of Environmental Quality (DEQ) to support native salmonid spawning, egg incubation, and fry emergence. For the Sandy Basin the period that supports spawning, egg incubation, and fry emergence has been determined to be from October 1 through May 31.

Table 19. Summary of Stream Temperature Monitoring Results - Zigzag Ranger District

Site	Monitoring Period	Daily Maximum Temperature °C	7 Day Average Of Maximum Daily Temperature °C
Bull Run River (above reservoirs)	June 1 - Oct. 1	14.9 (Aug. 4)	14.6 (Aug. 2)
Fir Creek	June 1 - Oct. 1	13.6 (Aug. 28)	13.0 (Aug. 26)
North Fork	June 1 - Oct. 1	13.0 (July 12)	12.4 (July 30)
South Fork	June 1 - Oct. 1	14.9 (Aug. 4)	14.4 (Aug. 1)
Upper Little Sandy	July 11 – Oct. 14	14.9 (Aug. 4)	14.3 (Aug. 1)
Middle Little Sandy	July 11 – Oct. 14	17.5 (Aug. 4)	17.0 (Aug. 1)
Lower Little Sandy (USGS gaging station)	July 11 – Oct. 14	18.3 (Aug. 4)	17.7 (Aug. 1)
Lower Little Sandy @ confluence with Bull Run River	July 11- Oct. 14	17.9 (Aug. 12)	17.1 (July 13)
Sandy River at Forest Boundary	July 14 – Oct. 14	14.4 (Aug. 17)	13.7 (Aug. 29)
Upper Still Creek	July 15 – Oct. 11	9.8 (Aug. 4)	9.5 (Aug. 1)
Middle Still Creek	July 15 – Oct. 11	10.3 (Aug. 25)	9.9 (Aug. 25)
Lower Still Creek	July 15 – Oct. 11	13.9 (Aug. 26)	13.6 (Aug. 25)
Lower Clear Fork	July 15 – Sept. 27	13.7 (Aug. 4)	13.4 (Aug. 1)
Lower Eagle Creek	July 22 – Nov. 8	16.1 (Aug. 4)	15.8 (Aug. 1)
Crater Creek at Pacific Crest Trail	July 15 – Sept. 27	8.1 (July 21)	7.7 (July 24)

Hood River Ranger District

Twenty three sites on 19 streams were monitored for water temperatures with continuously-recording thermographs (Onset's Hobo-temp and Tidbits) from spring to fall of 1999. Sites were chosen with the following criteria: potential for (or documented use) by bull trout, anadromous fish, sensitive species, and/or site was suspected to have unnaturally elevated temperatures due to management. Sites include: West Fork Hood River, East Fork Hood River, Lake Branch (2), Iron Creek, McGee Creek, Red Hill Creek, Robinhood Creek(2), Meadows Creek, Tilly Jane Creek(2), Doe Creek, Dog River, Upper Clear Branch, Lower Clear Branch (2), Coe Branch, Eliot Branch, Bear Creek, Tony Creek, Mill Creek and WF Neal Creek. General findings are summarized below:

In general, 1999 was an extremely good water year, with adequate snowpack resulting in above average flows and cooler temperatures than the rest of the same decade. Stream temperatures throughout the Hood River basin were generally the lowest since temperature monitoring began in 1994 (drought years).

Lake Branch temperatures are likely close to natural conditions as warm surface waters from Lost Lake are spilled over into Lake Branch during summer months. The water cools considerably by the time it gets to FS boundary 9 mile downstream. Below Lost Lake the 7 day average maximum water temperature for Lake Branch in August (hottest month) is 21.1 degrees C, while at the National Forest boundary it is 15.4 degrees C.

Nineteen ninety nine was the first year a thermograph has been placed in Mill Creek. The 7 day average maximum water temperature for Mill Creek reached 13.8 and 14.6 degrees C. in July and August, respectively. At this point, the District is not overly concerned with this stream, as native cutthroat eggs/fry will likely be incubated and well out of the gravel by June. The same applies to steelhead which spawn well downstream of this site (10 + miles). This site will be monitored to see if recovering riparian areas will start to decrease stream temperatures in the future.

The Oregon State Department of Environmental Quality changed their standards (July 1996) to a 7 day average maximum water temperature of 17.8 degrees C. Waters containing bull trout should not exceed a 7 day average maximum water temperature of 10 degrees C., while waters which "support salmon spawning, egg incubation and fry emergence from the egg and from the gravels" shall be less than a 7 day average maximum of 12.8 degrees C at time from spawning to emergence

None of the twenty-three sites exceeded the 17.8 degrees C standard, except Lake Branch at Lost Lake outlet (35 days). As stated above, this is likely a natural condition due to surface warming and spill from the lake.

All but six sites exceed the 10 degree C daily maximum average standard. Creeks with bull trout are underlined. The six sites that met this criteria are: Upper Clear Branch, Doe Creek, Eliot Branch, Iron Creek, Upper Robin Hood Creek, and Upper Tilly Jane Creek. Other streams that contained bull trout but exceeded the 10 degrees C standard was Coe Creek, Bear Creek, and lower Clear Branch. These 3 locations did not get above 11 degrees C for the 7 day average maximum, thus were very close to meeting criteria.

Overall, the temperature regimes within the FS lands are adequate to sustain salmonid species. There are, though, short reaches that have elevated temperatures due to management and/or natural conditions. Due to these concerns, sites will continue to be monitored and , where possible, management actions will be taken to try and reduce stream temperatures so that they are closer to natural conditions.

Overall, the temperature regimes within the FS lands are adequate to sustain salmonid species.

Recommendation

Continue both baseline and project-related water temperature monitoring Forest-wide.

Turbidity Monitoring

Clackamas Ranger District

Eagle Creek

Turbidity monitoring was conducted at two sites within the South Fork Eagle Creek watershed. The sites are located on the South Fork of Eagle Creek within the Eagle Timber Sale planning area. Samples were collected in July, and November. The samples in November were taken during a significant rainfall period. All samples were measured with a portable turbidimeter. Results of the monitoring showed a range of turbidity from 0.60 NTU taken during low flow conditions to 2.6 NTU taken during a bankfull event.

The range of turbidity appears to be within the natural limits. The sites were set up to monitor any increases in turbidity which may be caused by timber harvest. Continued monitoring will be needed to assess any effects of harvest on water quality.

An automated turbidity monitoring station is currently scheduled to be installed during summer 2000 just upstream of the U.S. Fish and Wildlife Service fish hatchery.

Clackamas River (Carter Bridge)

In December 1999 a continuous monitoring station at the Carter Bridge on the Clackamas River began operating. Turbidity, pH, conductivity, and stage are recorded every 15 minutes. The objective for this monitoring is to develop water quality trends for the identified parameters and also enable early warning for downstream Municipal water suppliers if elevated turbidity occurs during storm periods.

Zigzag Ranger District

Alder Creek

In a cooperative effort between the Forest Service, Bureau of Land Management, and the City of Sandy, stream gaging stations have been installed on Alder Creek and the East Fork of Alder Creek at the Forest Service and Bureau of Land Management boundaries respectively.

These stream gaging station will measure streamflow and turbidity with the data telemetered to the Zigzag Ranger Station. As of February 2000 turbidity is being logged every ½ hour on a datalogger at each site. The equipment to telemeter the data is planned to be installed in the spring or summer of 2000.

Water Quality Monitoring of Salt Application to Palmer Snowfield at Timber Line Ski Area - 1999 Season

Timberline Ski Area applies salt to approximately 320 acres including the Palmer snowfield from and extends from the top of the Palmer Chairlift to the bottom of the Magic Mile Chairlift during the summer ski season. Since 1990 RLK and Company has retained Golder Associates to complete the annual water quality monitoring report. As a result of ODEQ's 401 certification involvement, Timberline's water monitoring program was significantly expanded in 1997.

Total salt applied during the 1999 summer ski season was 1,107,940 pounds. Salt was applied to the Palmer snowfield on nearly a daily basis from May 22 to September 7, 1999. Additional salt was applied to the snowfield on a sporadic basis from September 20 to October 20, 1999.

Precipitation for the 1999 water year totaled 138.8 inches and was the third highest in the 12 years Timberline has performed the monitoring.

Water samples were collected each week during the summer season and monthly for the remainder of the year, by Timberline employees. Samples were collected from nine stream locations within the Palmer drainage, and from three locations outside the Palmer drainage area. Samples are analyzed for chloride, specific conductance, and total dissolved solids.

Three permanently installed dataloggers record temperature, chloride and conductance throughout the year. These are located at the Salmon River 3445 site (USGS Gaging Station) adjacent to Hwy 26, and two are on Still Creek, at sites 3600 and 3800 (Host site.) All three data loggers record data every 15 minutes during the summer ski season and at one hour intervals during the remainder of the year.

Streams sampled within the Palmer drainage include the Mile Canyon, Salmon River, West fork Salmon River, and Still Creek. Streams sampled outside the Palmer Drainage include Camp Creek, White River, and Little Zigzag River.

The most recent report by Golder Associates covers the period from mid-September 1998 to mid-September 1999 and includes a sampling database since 1988. The following information is taken from the Golder report dated February 9, 2000.

Results

Chloride and specific conductance have remained relatively stable in all streams from 1988 to 1999, despite an overall trend of increased salt application. Short-term seasonal changes in chloride and specific conductance are observed in the upper elevation stations in Salmon River and Still Creek in response to salt application on the Palmer Snowfield.

Chloride and specific conductance typically increases in the Salmon River and Still Creek above the 3,000' elevation near the end of the summer salt application periods, and decreases to normal values within a few days after salt application ends for the year. Chloride and specific conductance are typically reduced to levels similar to lower elevation (2,000') or background streams over the winter months.

Chloride

The mean chloride concentrations in background streams ranged from 1.17 mg/l to 2.90mg/l and are lower than the mean concentrations in Salmon River and Still Creek between 3,000 and 4,000 ft elevations and arranged from 7.68 to 11.76mg/l. The mean concentrations of lower elevation (2,000 ft) stations within the Palmer drainage (2.42 to 4.6 mg/L) are similar to the range of mean chloride concentrations in streams outside the Palmer drainage.

Mean chloride concentrations in the Salmon River have fluctuated slightly over the past 12 years, but have not exhibited increasing or decreasing trends with the exception of the West Fork Salmon River which has increased from 3.1 mg/L in 1997 to 12.5 mg/L in 1999.

Chloride concentrations at Still Creek Camp Host (el: 3800 ft) were all below 13 mg/L during the 1999 salt application period. Overall, there is a slight increase in chloride concentrations from less than 8mg/L in June 1999 to 13mg/L in Mid-September 1999. Chloride concentrations in Still Creek 3600 were slightly higher than Still Creek Camp Host concentrations, ranging between 10mg/L and 17mg/L from early July through the end of the evaluation period. This is likely due to the influence of Mineral Springs/Creek, its confluence located below the Host site and above Still Creek 3600.

Specific Conductivity

Specific conductance values in all measured streams were 170 umhos/cm or less through the 1998/99 monitoring year, with the exception of several elevated values at Mile Canyon. These were attributed to effluent from a pipe exposed by snowmelt and erosion in July 1999.

The mean specific conductance (90umhos/cm) at West Fork Salmon River 4000 site is the highest for the four year record at this stream. It is unknown at this time if this is an increasing trend. The mean specific conductance at the Salmon River 3445 site is the lowest ever recorded.

All specific conductance values are below ODEQ guidance established by ODEQ.

Datalogger Measurements

Chloride measurements at all three sites were all below 12mg/L, but are consistently 4-5mg/L lower than the laboratory results. Conductivity measurements. Specific conductivity measurements for the year were below 100 umhos/cm.

Total Dissolved Solids

The TDS concentrations at Salmon River 3445 ranged from 17mg/L to 100mg/L during the 1999 salt application period. There was no exceedances of the ODEQ criterion of 117mg/L.

The TDS Concentrations in Still Creek 3600 (located just downstream from the confluence of Mineral Creek) ranged from 54 mg/L to 140mg/L during the salt application period. The TDS concentrations were 120mg/L to 130mg/L for six consecutive sampling events beginning in October 1998 to January 29, 1999. TDS concentrations reached 120mg/L in August 1999, but the weekly mean did not exceed 120 mg/L at any time. On November 4 and 9, 1999, TDS was 130mg/L, representing an exceedance of the weekly average of 120mg/L for that week.

In 1997 ODEQ set the maximum mean TDS concentrations at 117mg/L, but due to Golder's monitoring equipment, concentrations greater than 100mg/L can only be measured in increments of 10. This results in their rationale that a true exceedance can only be established for measurements greater than 130mg/L.

The increase in TDS in the fall of the past two years at Still Creek 3600 does not follow the historic trends observed for chloride and specific conductance at this location. Chloride and conductance typically increase during the summer months and decrease as soon as salt application ends in September or October of each year. However, TDS concentrations were elevated in the fall and early winter of 1998, and appear to be following a similar trend in 1999. This indicates that other factors may be contributing to the elevated TDS.

Conclusions and Recommendations

Based on the data presented above, the following conclusions and recommendations are made:

- The overall chloride levels do not appear to be increasing in the Palmer drainage area.
- Chloride concentrations and specific conductance are elevated above background in upper (>3,000 ft elevations) stream stations within the Palmer drainage area during the salt application period, however, concentrations return to those similar to background over the winter months at the end of the salt application period.
- During the salt application period, chloride and specific conductance are elevated in upper (>3,000 ft elevations) stream stations within the Palmer drainage, but are similar to background by the lower (2,000 ft elevation) stream stations within the Palmer drainage.
- The large snowpack on the Palmer snowfield results in considerable runoff, which serves to dilute chloride in surface water originating at the Palmer snowfield.

- Specific conductance and chloride at Still Creek 3600 are influenced by inflows of geothermal water from Mineral Spring and Mineral Creek. The new data-logger and stream flow gage at Still Creek Camp Host provide data that represent Still Creek without the influence of Mineral Creek and Mineral Spring. The Still Creek Camp Host Station better monitors the effects of salt application at the Palmer snowfield on Still Creek.
- Laboratory and data-logger measurements of chloride concentrations in Salmon River and Still Creek are low and remain substantially below aquatic water quality standards.
- Laboratory measurements of specific conductance in Salmon River and Still Creek are all below the ODEQ guidance value of 175 $\mu\text{hos}/\text{cm}$.
- TDS values at Salmon River 3445 and Still Creek 3600 are typically below the ODEQ guidance value for TDS (117 mg/L), with exceptions occurring in the fall of the past two years at Still Creek 3600 (i.e., below the point where Mineral Creek enters Still Creek). These values will be further monitored to determine if exceedances occur, and to determine the cause of the exceedances.
- The dataloggers at Salmon River 3445 and Still Creek 3600 provide chloride, specific conductance, and temperature measurements from all hours of the day throughout the entire year. This information is very useful for monitoring the water quality at these stations, and it is recommended that these instruments be used to provide long term monitoring for the three primary stations on Salmon River and Still Creek. Since these dataloggers provide nearly continuous monitoring, it is recommended that the datalogger measurements be used as the primary monitoring data, and that manual sample collection be phased out in the near future at most stream sampling locations.
- The discrepancy observed in the datalogger measurements relative to the laboratory data can possibly be addressed by conducting instream calibration of the chloride and conductivity probes. The manufacturer of the probes has reviewed these data, and has suggested the probes be recalibrated annually or semi-annually at their installation locations. Instream calibration will allow the instrument to compensate for any other effects related to other ions or conductive materials in the stream, and should provide increased accuracy in the instrument measurements.

Other Monitoring

Mt. Hood Meadows Water Quality

Baseline data for the Mt. Hood Meadows Ski Area continues to be collected on the Hood River Ranger District. This effort consists of two monitoring stations owned and operated by the Mt. Hood Meadows ski area, which have been operating for about seven years. Turbidity, water temperature, conductivity, and stage are monitored continuously. The Mt. Hood Meadows staff checks the monitoring equipment periodically, about every two weeks, and reviews the monitoring data for abnormal readings.

Stream Discharge

The Forest funded a telemetered USGS stream gage on Fish Creek (Clackamas River Ranger District), and has reestablished a discharge measurement gage at a previously decommissioned USGS gaging station on the Upper Clackamas River at Big Bottom. Streamflow information from the Fish Creek gage is useful for characterizing the hydrology of the watershed and also providing real-time flow information to provide an alert for implementing flood emergency road maintenance (FERM) surveys and patrols. The Forest has also reestablished a previously abandoned USGS gaging station on the Zigzag River. This site will also be used to characterize the hydrology of the watershed, and also as an “early warning” indicator for FERM plan activation on the Zigzag Ranger District.

November 25th 1999 Flood Patrols

The Sandy basin experienced a large flood event during the Thanksgiving weekend of 1999. This flood event exceeded the 50-year recurrence interval event at the Bull Run River gage above the reservoirs and exceeded streamflows from the 1996 storm at this site. The storm was characterized with extremely heavy rain over a two day period (17 inches of rain at the North Fork SNOTEL site in the Bull Run Watershed) with limited snowmelt.

Flood patrols were sent out on November 25th and 26th to look for road damage and associated water quality problems from the storm.

Within the Sandy Basin the problems encountered included:

- Plugged culverts from debris torrents on the Lolo Pass Road (road 18).
- Landslides on the upper end of the 1828 road closing the road.
- Large woody debris plugging the culvert where Falls Creek crosses the 10 road in the Bull Run Watershed.
- Plugged culverts on the 10 and 1010 roads in the Bull Run Watershed.
- Overflowing culverts on the Still Creek road (road 2612).
- Undermining of an open bottom arch on the Still Creek road (road 2612).

Quick action by the flood patrols from the City of Portland Water Bureau and Forest Service enabled crews to clear plugged culverts before any of the roads washed out.

Falls Creek Stream Stabilization Project

A 200-foot riprap revetment was constructed on the West Branch of Falls Creek to provide a base for an over-steepened landslide scarp and allow the slope to stabilize. This project occurred on the West Branch of Falls Creek just upstream from the confluence with Falls Creek

The Environmental Assessment for this project limited turbidity increases to less than 10 Nephelometric Turbidity Units (NTU's) and called for monitoring during project activities. During the project, monitoring occurred three times per day (before, during and after activity) and whenever visible turbidity was observed.

Monitoring results indicated (at the 99% confidence level) turbidity levels 0.2 NTU's higher 100 feet below the project and 0.14 NTU's higher 600 feet below the project site during project activities. These are very slight increases and would indicate that the water quality best management practices implemented on this project adequately protected water quality.

The only time that turbidity levels exceeded 10 NTU's was when the water that was diverted down a side channel during construction activities was routed back into the main channel and against the rock wall revetment. This was on August 31st from 1:00 to 3:00 in the afternoon.

After project activities, three pumping samplers were installed to evaluate the effects of the project during high streamflows associated with storm events. Two of the samplers were upstream of the project (one in Falls Creek and one in the West Branch of Falls Creek) and one was below the project. On November 25th, 1999 there was a large storm event (greater than a 50 year recurrence interval streamflow) associated with extremely heavy precipitation (17 inches of rain in two days at the North Fork SNOTEL site in the Bull Run Watershed). This large storm event broke the intakes for the upstream pumping samplers and swept away the downstream sampler (pieces have been sited in reservoir #1). The City of Portland Water Bureau and Forest Service personnel agreed that the riprap revetment was functioning as designed and protected the landslide scarp and there was not a need to re-install the pumping samplers.

The limited sampling (7 samples) that was completed prior to the November 25th storm event indicates that there is no significant difference between turbidity levels above and below the project on Falls Creek using the Seasonal Wilcoxon-Mann-Whitney Test.

Bull Run Road Decommissioning

The Zigzag Ranger District plans to decommission about 40 miles of roads in the Mainstem subwatershed of the Bull Run River drainage above Reservoir No. 1 over the next five years. This action will begin efforts to eventually close roads no longer needed as recommended in the Bull Run Watershed Analysis developed under the Northwest Forest Plan and by the Zigzag Ranger District Access and Travel Management Plan (ATM).

Primary emphasis for construction work is removal of drainage structures and associated fill materials for natural streams and drainages crossed by roads. Additionally, ditch relief culverts are removed and cross ditches sloped gently to accommodate runoff while minimizing erosion. Removal of the fill at stream crossings is meant to restore the original stream channel and banks to original pre-road (natural) contours as much as possible.

Stream sampling above and below road crossings at representative sites is planned in order to evaluate water quality effects for turbidity, and water temperature (summer). At the project monitoring sites a comparison of the turbidity data above and below the project area before, after, and during the project may be used to characterize levels, duration and declines of sediment produced from representative project sites.

Due to the inaccessibility of most of the project area during the winter months, use of automated sensors able to sample turbidity and streamflow would be planned. Turbidity would be measured in NTU's, nephelometric turbidity units. Turbidity sensors with a self-cleaning wiper are available to sense turbidity levels frequently and average values over a time period such as an half hour. The half hourly average value is the selected data point.

Duration of monitoring for the road decommissioning activities would be planned to continue at least two years following a crossing removal, until a five year recurrence event is believed to have occurred near the project area, or until City and USDA Forest Service staff are convinced that risks for additional erosion are very small (using revegetation, and stability of the area as indicators). Results of this monitoring would be summarized and provided to the City and public in an annual report.

For water year 1999 water pre-activity monitoring sites were established above and below the 1027 road crossing on Nanny Creek. This stream crossing is planned to be removed in the summer of 2000. The upstream monitoring site was functioning through the November 25th storm, however, the downstream site was out of commission due to a bear eating the wiring.

Preliminary results from the upstream site indicate turbidity levels near 100 NTU's during the storm event.

Recommendations

Best Management Practices

Continue implementation of the Best Management Practices Evaluation Process (BMPEP), using the updated tracking forms provided by Forest watershed staff.

Forest Headquarters hydrology staff will assist Districts in accomplishment of BMP monitoring.

Consideration should be given to contracting for some of the BMP monitoring, given limited personnel and the large program of work associated with flood restoration and other project planning efforts.

Watershed Effects Analyses

Continue the process of providing interpretations and guidelines for implementing Forest Plan standards and reflecting the findings and recommendations of ongoing research efforts. The objective is to develop consistent approaches across the Forest. Additional work is needed to compare the current watershed condition with established thresholds of concern for various watersheds.

Effectiveness Monitoring

Continue both baseline and project-related water temperature monitoring Forest-wide. Continue implementing the program to monitor turbidity at key locations on the Forest, focusing on streams/watersheds which are source areas" for domestic/municipal water supplies. For those streams identified as exceeding state water quality temperature standards, do additional monitoring in 2000/2001 to determine if the water temperatures are naturally elevated. If the elevated water temperatures are a result of management activities or wildfire, work will begin on Water Quality Restoration Plans.

Timberline Ski Area Water Quality Monitoring

The monitoring program should continue over the coming year to observe any temporal changes in water quality that may be attributable to salt application on the Palmer Snowfield, and to refine the salt loading model for the Palmer Snowfield and streams draining from the area. Forest Service oversight should continue to ensure that monitoring is in full compliance with the requirements of the permit issued by the Oregon Department of Environmental Quality.

A key goal of the Mt. Hood Forest Plan is to protect and maintain the character and quality of water, providing for long-term sustained production resulting in favorable flows from the watersheds on the Forest. In addition, the unique and valuable characteristics of floodplains, riparian areas, and associated riparian and aquatic ecosystems are to be protected.

The purpose of various water resource monitoring activities is to assess Forest Service compliance with the Clean Water Act, as outlined in a Memorandum of Agreement with the State of Oregon. Water quality Best Management Practices (BMPs) and related Forest Plan Standards have been developed to achieve compliance with the Clean Water Act and state water quality regulations. The objective is to meet Federal Designated Management Agency obligations and responsibilities (under the Clean Water Act) with respect to nonpoint source pollution control.

Monitoring Element: Transportation/Roads

Goals

The construction and maintenance of roads will minimize environmental damage and meet resource and Forest visitor needs. Provide safe and efficient access for those who use the transportation system and manage the forest.

Monitoring Activities

Road Construction and Reconstruction

In 1999, 4.6 miles of local road were constructed for timber support on the Forest. There were 39.5 miles of road reconstructed. Most of this reconstruction is repair of damage resulting from the 1996 and 1997 flood events. The annual Forest Plan outputs for the first decade were 16.6 miles of new construction, 17.5 miles per year of collector reconstruction and 74.0 miles per year of local road reconstruction. During past years, these outputs have been reduced. The reduction in miles of road constructed or reconstructed can be attributed to one of the following:

- A major reduction in budgets for Capital Investment Road Program which effects reconstruction of arterial and collector reconstruction.
- A reduction of timber harvest from Forest Plan outputs which has a direct effect on local construction and reconstruction.
- More use of helicopter logging eliminates need for new road construction.
- Construction of temporary roads to harvest timber and then obliterating them after project completion.

These trends, which will continue, aid in keeping long term erosion of sediment at a minimum and will not increase the road system. The flood repairs completed this year will also reduce long term sediment erosion.

Evaluation

This item was monitored adequately. However, the change in the projected Forest Plan outputs for miles of miles of road construction and reconstruction should be reviewed and changed to reflect the change in timber harvest, reduced budgets, and policy decisions which will likely result in additional road closures.

Road Closures/Road Decommissioning

Currently, 475 miles of system roads are in the maintenance level 1 (closed road) category, of which 26.8 miles were closed in FY 1999. These roads are closed to vehicular traffic but drainage facilities are maintained. Since the implementation of the Forest Plan, approximately 295 miles have been closed. Approximately 391 miles have been decommissioned and removed from the transportation system. In FY 1999, approximately 89 miles of road were decommissioned.

The decisions for these actions were made through the district planning process to meet specific resource needs and to meet the Forest Plan standards and guidelines.

Road closures and road decommissionings have a direct effect on open road density. Forest Plan standards and guidelines identify maximum levels of open road densities for each management area. Most districts do planning on a few areas annually, while other districts have analyzed the entire district as a whole to determine which roads should be closed or decommissioned. These analyses are updated as new planning efforts occur. Currently, the amount of roads identified for closure or decommissioning has exceeded the Forest's funding available for implementation.

Closed

Roads identified for closure are closed to traffic, but will remain on the road system. These roads have an identified need (generally within seven years). Roads needed for future timber harvest activities or fire protection efforts would fall into this category.

Decommissioned

Roads identified for decommissioning have no identified future need (generally within ten years) or are at a high risk for resource damage.

Evaluation

This item was monitored adequately. During the planning process opportunities to reduce road densities are being identified, but there is not enough funding available to implement this reduction. This may result in not meeting the goals set forth in the Forest Plan standards and guides. During the next year we will continue to develop the Infra/Travel Routes application, which will help determine current Forest road densities. This will be used in conjunction with the Roads Analysis process to identify areas to emphasize in closing and decommissioning roads.

Road Management

The Forest has completed the Mt Hood Access and Travel Management Plan. This Access and Travel Management (ATM) plan will have an effect on road management and maintenance plans. Due to reduced road budgets, resource protection, management needs and policy direction, it is necessary to downsize the forest transportation system. The ATM Plan suggests reductions in road maintenance levels to a minimum system that will still meet the anticipated public needs while trying to stay within the road maintenance budget. Following is a table showing road maintenance levels and vehicle access type before and after the ATM Plan by district.

Table 20. Road Maintenance Levels

District	Maintenance Levels/Access Type					
	1 - Closed		2 - High Clearance		3-5 - Passenger Car	
	Before	After	Before	After	Before	After
Clackamas	646	886	451	427	513	243
Barlow/Hood River	595	450	692	548	397	254
Zigzag	39	97	68	122	100**	113
Bull Run*	30	116	174	190	139	0
Forest Total	1,310	1,549	1,385	1,287	1,149	610

* The road system in the Bull Run watershed is closed to all public traffic.

** District boundaries changed while the ATM was being developed. Bear Springs Ranger District miles were divided up between the districts listed above.

The road system within the Bull Run watershed is maintained to accommodate the City of Portland to maintain the City's water supply and for Forest Service Administration. The road system before and after the ATM does not change public access to the Bull Run watershed. The following discussion of effects on public access will not include the Bull Run road system.

The table shows a considerable decrease in the number of miles available for passenger car traffic (40% decrease) as well as a decrease in the number of miles available for high clearance vehicles. However, most of the road mileage listed under Maintenance Level 1 will not be physically blocked but will be allowed to close naturally, i.e. brush in, not log out. If funding becomes available to close these roads, the implementation rate would increase.

Some effects of downsizing the road system are as follows:

- Only one main route will be maintained to access an area or developed campground for passenger car use instead of two or three.
- There will be a decreased amount of miles available for recreation opportunities that accommodate passenger car traffic. Recreation opportunities that accommodate high clearance vehicles would be increased.
- The increasing demand of forest recreation use along with the decreased amount of miles available for passenger car traffic will result in more vehicle encounters, raising the probability of accidents occurring. However, maintenance efforts will be more focused on the mainline access roads.
- We should expect fewer landslides to occur.
- There will be less sediment reaching waterways.
- There will be less harassment to wildlife.

Road Maintenance

In 1999 there were 842 miles of road classified in maintenance levels 3-5 (maintained for passenger car use). However, due to the 1996 and 1997 flood events, many roads were not maintained to their designated levels and some road systems were blocked off to traffic. Approximately 213 miles were maintained to standard. There were 2,130 miles of road classified as maintenance level 2 (maintained for high clearance vehicles). Approximately 621 miles were maintained to standard. Roads maintained to standard are defined as roads that meet the intended maintenance standard (these may be roads that meet the intended standard with little or no work) or roads that are planned to be moved into a lower maintenance category. The Forest Plan projected 1,222 miles of maintenance on levels 3-5 (passenger car use) and 1,678 miles of maintenance on level 2 (high clearance vehicles). These projections were not met this year. The reasons are:

- The Forest is in the process of phasing in the ATM plan which will reduce level 3-5 miles.
- The 1996 flood events resulted in blocking off an entire watershed (Fish Creek) and level 3-5 standards could not be met on many flood damaged roads.

Recommendations

- Revise Forest Plan outputs for road construction and reconstruction to reflect reduced budgets and reduced timber ASQ.
- Continue implementation of the Forest Access and Travel Management (ATM) Plan. The effects of the ATM Plan should be addressed in the next round of Forest planning.
- Develop a GIS/INFRA/Travel Routes analysis to determine current forest-wide road densities for management areas over the entire forest.

Monitoring Element: Wildlife/Plants

Goal

The emphasis continues to be on maintaining persistent and viable populations of native and desirable nonnative wildlife and plant species by:

- Protecting and restoring the biological and physical components, function and interrelationships of forested ecosystems,
- Protecting and restoring rangeland ecosystems,
- Providing quality recreation experiences with minimal impacts to ecosystem stability and condition, and
- Conserving populations of threatened, endangered and sensitive species through recovery and management efforts.

In addition, the implementation of the Northwest Forest plan has meant that consideration is not only given to threatened, endangered and sensitive species during the planning of management activities but to species classified as Survey and Manage species. This group includes lichens, bryophytes (mosses and liverworts), fungi, mammals, amphibians, and mollusks.

Threatened, Endangered, and Sensitive Species

Bald Eagle

The bald eagle is listed as threatened by the state of Oregon and the US Fish and Wildlife Service. Bald Eagles are primarily a winter migrant on the Forest. There is evidence of past nesting. Areas are designated in the Forest Plan (LRMP) for nesting and established winter communal roost areas.

Results

One former nest site was monitored in 1999. The site was found to be unoccupied. This site has not been occupied for several years. This former nest site has been protected and is receiving use by ospreys. No communal roost have been located on the Forest but an individual roost site has been identified. This site is currently protected by management guidelines in the Bull Run Watershed.

Northern Spotted Owl

The northern spotted owl is listed as threatened by the US Fish and Wildlife Service. Management of spotted owls is outlined in the Standards and Guidelines (4/94) for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (Northwest Forest Plan).

Results

The basic assumption that maintaining required habitat and operating outside of critical periods is sufficient to maintain a persistent and viable population of spotted owls has resulted in less and less monitoring efforts. A total of thirty nine areas were monitored for spotted owl activity but most were related to project compliance and were not at a level to assess reproduction or population trend. There will be little opportunity to increase the monitoring effort for the current year.

Peregrine Falcon

The peregrine falcon has been delisted as endangered by the US Fish and Wildlife Service in 1999. The Forest Service will continue to manage peregrines as a sensitive species. Potential nesting habitat for the peregrine occurs on all Ranger Districts.

Results

Monitoring for peregrine nesting in 1999 was confined to the two known nest sites. Fledging success at the two identified sites decreased in 1999 with one nest site being unsuccessful. One of the peregrine sites has been gated and fenced to protect the site from disturbance. A management plan was completed for one site and is in draft form on the other.

Lynx

Lynx is proposed for listing by the US Fish and Wildlife Service in 2000. Lynx are well adapted to hunting in deep powdery snow. Their large foot pads give them a competitive advantage for hunting snowshoe hares in snow conditions that would make it impossible for other predators. The adaptation for particular snow conditions and their association with snowshoe hares restricts their potential habitat in Oregon and on the Mt. Hood.

Results

A lured marking station protocol was utilized across the forest to determine the presence of lynx. Hair samples were collected at two sites. The results of DNA confirmation is still pending. Three districts reported sittings from unproven sources. One district reported probable lynx tracks. Habitat for lynx is being defined on the forest and GIS mapping of potential habitat is still in progress. An independent study of snow conditions has been initiated on one district and a second district has plans of similar studies. Based on trapping records the Oregon Department of Fish and Wildlife feels this species has been extricated from Oregon. If lynx are present on the forest their numbers are limited. The current potential habitat map may overestimate the true extent of the lynx habitat because it is based on plant association groups and does not consider snow conditions. Surveys for lynx are ongoing to better define the presence of the species.

Sensitive Wildlife Species

Red-legged Frog

No species specific surveys for red-legged frog were conducted in 1999. The Wetland Wildlife Watch surveys indicated they found red-legged frogs and egg masses in the Bull Run reservoir in 1999. The population trend for this species across the Forest is unknown. One possible threat to this species is stocking trout in high elevation lakes.

Harlequin Duck

No surveys for harlequin duck were conducted in 1999. Based on previous surveys this species appears to be stable across the Forest. Nesting has been recorded in past years.

Sandhill Crane

Crane surveys were conducted on seven meadows on three districts (Barlow, Clackamas and Zigzag). Approximately 700 acres were surveyed on the Mt. Hood National Forest and 300 acres were surveyed on the Confederated Tribes of Warm Springs land during the 1999 season. Volunteers with Wetland Wildlife Watch and Portland Audubon Society and Forest Service employees were used to maximize the effort. Fourteen sightings resulted in 1-3 adult observations per visit and three observations of 1-2 colts. At a minimum there were 7 adult cranes on the Mt. Hood and 2 adults seen on the Confederated Tribes of Warm Springs lands.

Cope's Giant Salamander

A survey for Cope's giant salamander was conducted on the Forest by volunteers from the Wetland Wildlife Watch. There were no sightings of Cope's Giant Salamander during the survey.

Townsend's Big-eared Bat

No surveys were conducted for this species this in 1999. The distribution and population trend across the forest is unknown.

Wolverine

No surveys were conducted for wolverine in 1999 and no individuals were observed.

Common Loon

Surveys were conducted by the Wetland Wildlife Watch volunteers in 1999. Up to 6 birds were observed from April 2 to the end of the end of April. Nest platforms have been installed on Upper and Lower Bull Run Reservoirs but no nesting has occurred at this time.

Snags and Down Woody Material

The Northwest Forest Plan provided snags and down and woody material in Late Successional Reserves, corridors, and wilderness areas. All recent timber harvest units retain quantities of snags throughout to meet the needs of most primary cavity nesters with a few exceptions. Wildlife biologist on the Forest believe that we are meeting the standards and guidelines for snag retention on timber harvest units but we are falling below that guideline for down and woody material. The standards and guidelines for meeting the 100% population potential for some species such as white-headed woodpecker and black-backed woodpecker probably is not adequate to meet the actual needs of these species.

Summer and Winter Range

Deer and elk habitat is typically characterized as summer or winter range depending on the season of use. Additionally, biologist have recognized thermal cover as being important in conserving energy for big game during cold temperatures.

There is no standardized method of monitoring summer or winter range on the forest. Some sporadic monitoring does occur for specific project areas. In the absence of systematic monitoring biologist were queried regarding their professional assessment of the status of big game habitat on the districts.

Barlow Ranger District

Summer range forage has been decreasing for the last five years because of reduced regeneration harvest. Winter range is stable to increasing with the increased use of underburning methods. Deer populations are stable to increasing. Elk populations are stable.

Clackamas Ranger District

Winter and summer range have remained constant. Populations appear to be stable. Video technology has been used to monitor forage projects and permanent openings to determine effectiveness.

Hood River Ranger District

The trend on Hood River is toward more cover and less forage in both summer and winter range. The populations of deer and elk appear stable.

Zigzag Ranger District

There is very little timber harvest on the Zigzag Ranger District as a result of management of the Bull Run Watershed Management Unit. Therefore, the amount of cover is increasing and forage is decreasing. In the district biologist opinion, the populations of deer and elk are stable on the district.

Pine-Oak Habitat

All of the Pine-Oak management allocation is located on the Barlow District. Of the total 22,423 acre allocation, the amount maintained in adequate condition for turkey and grey squirrel was 22,423 and 13,500 acres respectively. There have been no changes from the 1998 figures. Overall, the Pine-Oak habitat on the Forest is considered to be stable.

Pine Marten and Pileated Woodpecker

Habitat Management Areas

All habitat management areas were dissolved as per the Northwest Forest Plan except those identified as connectivity between watersheds. The monitoring of these corridors has not been established.

Snag Density

Biologists have indicated that we are meeting the standards and guidelines for snags on timber harvest units but that progress still needs to be made in retaining down and dead material.

Table 21. Wildlife Resources

Elements	FY 99
Peregrine Falcon Nest Sites	2
% Projects Meeting Bald Eagle S&Gs	100%
Number of Known Spotted Owl Sites Monitored	4
% Projects Meeting Primary Cavity Nester S&Gs	100%
Projects Wintering Marten and Pileated Woodpecker Areas Meeting S&Gs	100%
% Summer Range S&Gs Met	100%
Pine Oak Habitat S&Gs Met	Yes

Recommendations

- Continue to monitor peregrine falcon and bald eagle nesting.
- Develop plans for statistical monitoring of spotted owls to confirm the Northwest Forest Plan assumptions.
- Use GIS to determine the amount and distribution of winter and summer range forage and cover areas.
- Expand Lynx surveys to sample habitats proposed as critical for lynx to determine lynx habitat use in the southern cascades.
- Continue use of prescribed fire to enhance big game forage areas on east side districts.

Sensitive Plant Species

In FY 1999, criteria used to determine which plant species are included on the Regional Forester's Sensitive List was standardized nation-wide. The revised list includes 34 plant species that are documented from or are suspected to occur on the Mt. Hood National Forest. In the FY 1998 Monitoring and Evaluation Report, recommendations focused on species considered to be most at risk. These include plants that live in non-forested habitat types such as meadows, grasslands, balds and cliffs. Three of these species were highlighted, Watson's lomatium (*Lomatium watsonii*), violet Suksdorfia (*Suksdorfia violacea*) and Tygh Valley milkvetch (*Astragalus tyghensis*).

Results

Noxious weeds continue to occupy the one known site of Watson's lomatium on the Forest. In 1999, knapweed plants were manually pulled to reduce competition with the lomatium and limit the amount of seed produced on the site. This is a continuing effort.

The 1998 Monitoring Report recommended that the Watson's lomatium site be monitored to determine whether boulders placed at access points was effective in limiting off-road vehicles. Funding did not allow for this monitoring to occur.

As recommended in the 1998 Monitoring Report, a partnership with the Pete's Pile Climbing Association to assist in the management of the Forest's single violet Suksdorfia site was formalized through a memorandum of understanding (MOU).

A recommendation to conduct a survey for Tygh Valley milkvetch in the vicinity of Green Lakes Quarry was not completed.

Preliminary work was completed on the conservation genetics of cold water corydalis (*Corydalis aquae-gelidae*) in partnership with the Gifford Pinchot National Forest and Salem District Bureau of Land Management.

Monitoring Questions identified in the Mt. Hood Land and Resource Plan include:

- Have sensitive plant inventories been conducted for all ground disturbing activities? Yes
- Have implemented mitigation measures been effective in maintaining the integrity of Sensitive plant sites? Yes
- Are Threatened, Endangered and Sensitive plant standards and guidelines being implemented? Yes

Recommendations

- Continue to manually remove noxious weeds from the Watson's lomatium site.
- Monitor the Watson's lomatium site to determine whether boulder placement to reduce off-road vehicle access is effective.
- Continue to work with the Pete's Pile Climbing Association to eliminate adverse impacts to violet Suksdorfia while allowing for managed recreational rock climbing.

- Conduct a survey for Tygh Valley milkvetch in the vicinity of Green Lakes Quarry to determine the extent of the existing population and assess what should be done to maintain this species on the Forest. A single plant is known from this site.
- Conduct an assessment of the current condition of Sensitive species that occupy meadow habitats including adder's-tongue (*Ophioglossum pusillum*), Strickland's tauchia (*Tauchia stricklandii*), and black lily (*Fritillaria camschatcensis*).

Northwest Forest Plan – Survey and Manage Species

Mollusk Species

Eleven species of mollusk have been identified as potentially being found on the Mt. Hood. Six of these species, Columbia oregonian, Oregon megomphix, Dalles sideband, Malone jumping-slug, blue-grey tail-dropper, and papillose tail-dropper were found during the FY 1999 survey season. Twenty seven projects were surveyed for mollusk. A total of 198 populations of mollusk, representing 6 species were located on 8,840 project areas.

Larch Mountain Salamander

Efforts to survey projects for Larch mountain salamander are underway for FY 2000. The protocol for this species requires use of many personnel to adequately survey for this species. The survey protocol for this salamander requires searching every 25 meters along a series of transects three times during the season when the temperature and moistures are suitable. This survey will require a tremendous amount of personnel effort.

Red Tree Vole

Surveys are planned for this species on the west side of the cascades on the Mt. Hood. Surveys will be completed during the summer for red tree voles.

Monitoring Element: Timber Resources

Goal

The goal of timber management is to help attain desired Forest ecosystem conditions, to produce a continuing supply of forest products, and to provide a positive economic return.

There are 1,063,450 acres in the Mt. Hood National Forest. If we look at the Northwest Forest Plan, and the FEMAT report of July, 1993, it shows the Mt. Hood Forest having 186,200 acres of Congressionally withdrawn areas; 304,950 acres in Late-Successional Reserves, 16,500 acres in unmapped Late-Successional Reserves, 71,450 acres of administratively withdrawn areas, and 484,350 acres in Matrix lands. The matrix is the federal land outside the four categories of designated areas set forth above. It is also the area in which most timber harvest and other silvicultural activities will be conducted. However, the matrix does contain non-forested areas as well as forested areas that may be technically or administratively unavailable for timber production.

After considerations for Riparian Reserves as well as other suitability restrictions, approximately 204,000 acres remain available for scheduled timber harvest.

Harvest Activities

Timber Sold and Harvested

Our 1990 Forest Plan identified a total timber sale program quantity (TSPQ) of 215 million board feet (MMBF) that could be sold on average per year over the decade. An allowable sale quantity (ASQ) of 189 million board feet per year was also identified in the plan. The Northwest Forest Plan identifies a Probable Sale Quantity (PSQ) for the Mt. Hood NF of around 67 million board feet per year, with the Fiscal Year 1997 targeted as the full implementation year where that goal would be met from then on. The 67 MMBF is “volume offered for sale”, not volume harvested (this amount varies from year to year depending on market conditions).

In 1995 the PSQ level of 67 MMBF was adjusted downward to 64 MMBF. This adjustment was made to reflect the need to protect 100-acre buffers around owl activity centers. 64 MMBF is the current PSQ for FY99.

46.5 million board feet was offered for sale in FY 99. Of this total, 14.2 MMBF came from salvage sales, and 32.3 MMBF came from green timber sales.

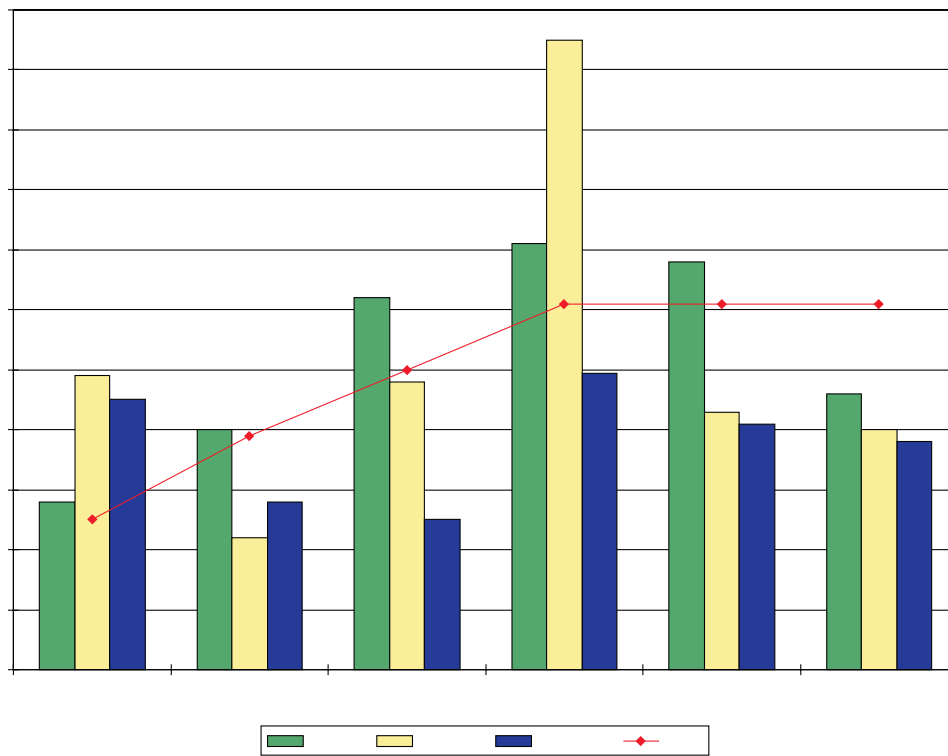
The following statistics show additional timber program details for FY 1999.

Table 22. Timber Volume Sold/Harvested - FY 99

Timber Volume Sold and Harvested		
	MMBF	CCF
Volume Offered	46.5 MMBF	87,370
Volume <u>Sold</u> and Awarded	40.4 MMBF	74,594
Value (Total Sold Revenue)	\$5,301,619	
Volume <u>Harvested</u>	37.5 MMBF	100,840
Acres <u>Harvested</u>	3,044 Acres	
Other Products Sold and Harvested		
Volume of Firewood Harvested	3,509 cords	
Value	\$40,809	
# of Christmas Trees Harvested	3,653	

The actual volume sold over the decade will vary year to year because sales are returned due to bankruptcies, defaults, weather events, etc., harvesting will also vary year to year. The following figure shows the actual volume of timber offered for sale and harvested since the Northwest Forest Plan was implemented.

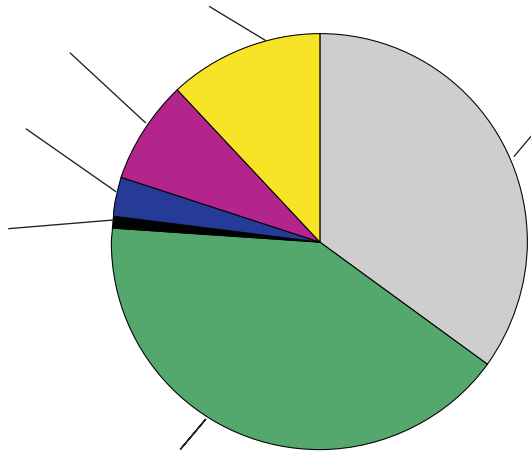
Figure 1. Mt. Hood National Forest Volume Summary



Harvest Methods

The following figure displays the types of harvest methods that were implemented during FY 99. Commercial thins accounted for the majority of the acres treated (41%). Selection cuts occurred on 35% of the overall acres, mainly on the eastside of the forest. The remaining acres used the following harvest methods: sanitation/salvage (12%), shelterwood (8%), clearcut with reserve trees (3%), and overstory removal (1%).

Figure 2. Silvicultural Harvest Methods (Acres Treated - 3,044)



Evaluation

Acres treated with different silvicultural methods shows a good mix of practices implemented to meet management objectives. Amounts of harvest methods assumed in the 1990 Forest Plan are different than those currently reported because clearcutting or regeneration harvest was assumed almost entirely in 1990 modeling. Reported acres follow management standards and guidelines, though, and the increases in thinnings, selection cuts and sanitation cuts, are a result of forest health issues and the concentration of efforts on younger stands. The very small amount of clearcut harvest is a direct response to standards and guidelines calling for more reserve trees and different approaches to harvesting for other objectives. Monitoring indicates that current management direction is being achieved.

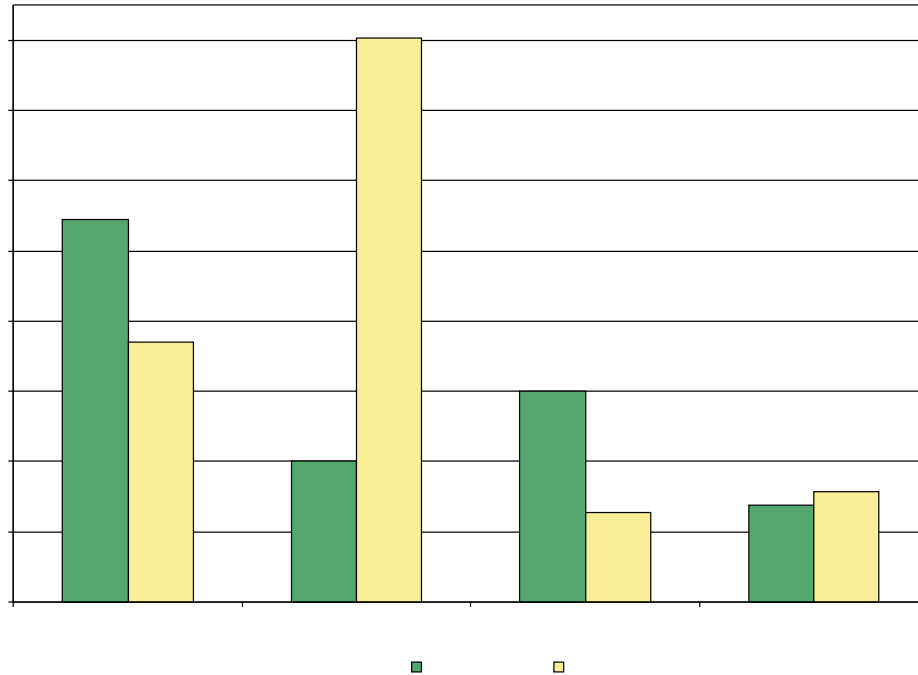
Silvicultural Activities

Silvicultural activities in FY 99, such as planting, thinning, release, and fertilization of young stands are at lower levels than FY98. The Mt. Hood National Forest reforested 2,368 acres in FY99, compared to 3,830 in FY98, 3,877 in FY97 and 4,758 in FY96. This downward trend in planting is directly related to the decreased level of regeneration harvests and decreased level of timber harvest overall.

The number of acres accomplished met targets assigned to the Forest, although the amount of acres being precommercially thinned is falling below Forest Plan projections for the seventh year in a row. This is due to lack of appropriated funding from Congress to accomplish our needs. The Forest accomplished 2,914 acres of combined thinning, release and fertilization on young stands less than 25 years old. This is a decrease from 3,759 acres in 1998 and more than the 2,295 acres treated in FY97 and considerably less than the 5,094 acres treated in FY96.

The following graph displays the accomplishment of both reforestation and timber stand improvement by ranger district in fiscal year 1999.

Figure 3. Reforestation and Timber Stand Improvement Accomplishments



Evaluation (Silvicultural Activities)

The total amount planted continues to decrease from previous levels. This is due to the overall decrease in harvest levels and less acres of regeneration harvest prescription.

Timber stand improvement (precommercial thinning) decreased by approximately 850 acres from 1998 levels and this amount is still substantially less than the identified need. This is due to congressional appropriations that emphasize funding of reforestation and do not fully fund thinning. Currently we are not meeting our Forest Plan projections of thinned acres, and we are continuing to add to the backlog of unthinned young stands. This has the potential to create unhealthy forest conditions for the future.

Regeneration Activities

Reforestation survival information available for trees planted in fiscal year 1999 is from the first year survival report. This showed from inventory of staked trees that the total first year survival was 79%. The survival rate of 79% is just slightly below the 80% performance goal set by the region. The rate would have been higher had not one of the district tree coolers went down about mid-season and stored seedlings were “warmed up” to unacceptable levels. Injuries from frost and dessication also played a role on outplanted seedlings. The forest has a 5-year average of 80% for first year survival and past experience indicates that reforestation will occur within the five year period required by law.

Acres harvested five years ago are tracked to ensure that reforestation will occur within the five year period required by law. The minimum standard to be considered adequately stocked is 125 trees per acre. Approximately 97-99% of the acres are now adequately restocked. The remaining one to three percent that is not adequately restocked has been planted but has less than 125 trees per acre because of rock piles, thick duff, pocket gophers, or other site factors. These are being evaluated for further treatments. In addition, natural regeneration may increase the stocking levels.

In order to maintain species diversity in our regeneration program, ten different tree species were planted in FY 99. An ongoing program of planting native conifer shrub, grass and forb species continue to be implemented on the Forest. Natural regeneration also supplements the diversity of planted species.

The timber management shift from westside to eastside has also shifted the volume of seedlings by species, for example less Douglas-fir and more ponderosa pine. The eastside sites are often more difficult to reforest due to low moisture levels and pocket gophers.

Evaluation

First year survival results for the forest as a whole are very similar to the performance experienced in past years, with a 5-year average of 80%. FY99 was at 79%, just below the regional goal of 80% due to a cooler breakdown. 97-99% of the acres harvested five years ago are adequately reforested and therefore compliant with NFMA and the Chief's policy of reforestation within five years. Approximately one to three percent, have not met the five year regeneration requirement and further treatments are being evaluated.

Forest Health - Insect Activity

Insect caused defoliation and mortality on the forest are monitored annually by an aerial sketchmap survey. The survey is conducted by Forest Insect and Disease personnel and maps current effects only, often indicated by red foliage. In 1999 the aerial survey showed approximately 6,738 acres of visible defoliation on the Mt. Hood National Forest and 6,760 acres affected by insects other than defoliators. The primary damaging agents in FY99 were Douglas-fir beetle on all districts, but to a greater extent on the Barlow Ranger District, and fir engraver on the Hood River Ranger District. A combination of larch casebearer and larch needle blight affected more than 6,600 acres on the Barlow Ranger District. Of note is very little damage from mountain pine beetle, but an increase in balsam woolly adelgid.

Table 23. Forest Health Indicators - Insect Activity

	1992	1993	1994	1995	1996	1997	1998	1999
Acres currently affected by defoliating insects	234,245	47,535	32,301	12,693	794	5,323	8,688	6,738
Number of trees killed by bark beetles, adelgids and other damaging agents	12,092	4,340	2,700	9,483	855	11,130	4,614	7,637
Acres affected by agents other than defoliators	20,835	8,920	4,275	11,548	3,447	1,968	2,019	6,760

Note: This table in past monitoring reports displayed a mix of reporting areas. Some years included only the Mt. Hood National Forest and some years included the forest and surrounding ownerships. The figures have been revised and updated in this report to include only the Mt. Hood National Forest.

Evaluation

More than 6,600 acres on the Barlow Ranger District were affected by the larch casebearer and larch needle blight. The larch casebearer is an introduced insect and consecutive years of defoliation can cause growth loss and contribute to mortality. However, casebearer populations commonly do not reach outbreak proportions partially because of the successful introduction of natural enemies. Therefore, the defoliation from casebearer is expected to decrease as the predators increase.

Both larch needle blight and larch needle cast are native organisms and neither of them cause serious impacts on thrifty, dominant and codominant trees. However, these larch needle pathogens, alone, or together with larch casebearer may kill or further reduce the competitive abilities of low-vigor suppressed or intermediate larch.

Approximately 4,000 acres were affected by the Douglas-fir beetle which is an endemic insect that breeds in weakened or down trees. More than likely these acres are associated with past defoliation, root disease or pockets of windthrow. Another 1,500 acres were affected by fir engraver mainly on the Hood River Ranger District. Fir engraver often kills trees affected by root disease or other stresses. Both of these two bark beetles have increased substantially since last year and similar levels are expected to continue given current forest conditions.

Mountain pine beetle attacks trees under stress and is highly related to stand density. Overstocked stands are very susceptible, therefore selection harvest and commercial thinnings have been implemented in recent years to decrease stand susceptibility to insect attack. Actual pine beetle mortality decreased substantially in FY99; however, the presence of large acres of overstocked stands increases the probability for insect outbreaks in the future.

Of interest is the 656 acres of balsam woolly adelgid identified by the aerial sketch map survey. This insect is a nonnative species that has become widely established in North America where it is highly destructive to Pacific silver fir, sub-alpine fir, and grand fir. The Mt. Hood National Forest was included in regional ground monitoring efforts in FY99 to see if populations are increasing.

Forest Health Restoration Spreadsheet

This was the third year the Forest implemented a new reporting requirement for ecosystem monitoring. A "Forest Health Restoration Spreadsheet" was developed to display numerous activities. These activities, when reported together in context, are generally accepted as representing those activities we need to do to maintain or restore health of each watershed. The key question being asked is: "To what degree is the forest outside the range of natural conditions, desired conditions or standards with regard to the factors below, and what is our rate of progress toward the desired state?"

- Resilience of Landscape to Fire
- Stand Structure
- Conditions in Riparian Zones

- Noxious Weeds
- Road Density
- Soil Productivity

Enclosed is the “Forest Health Restoration” summary spreadsheet for the Forest. The key question behind the spreadsheet is to report two basic things:

- Total acres of each activity outside: desired condition, range of natural conditions, or FP/NWFP Standards and Guidelines, which would indicate that these acres/miles need treatment. These acres are to be available for treatment, considering the land allocation.
- Treated acres in this last fiscal year, by District. In other words, what was our progress in treating those acres outside desired conditions on our districts? How far did we get in restoring forest health for that particular item?

Table 24. Forest Health Restoration Spreadsheet

Activity	Total Available Miles Needing Treatment as of 10/1/98*	Total Available Acres Needing Treatment as of 10/1/98*	Total Acres Treated by District				Total Forest Acres Treated
			Barlow	Clackamas River	Hood River	Zigzag	
Total Acres within Watersheds			175,497	414,879	208,416	266,606	
Forest Service Acres			164,632	409,993	190,592	256,533	
Prescribed Burn							
Natural Fuel		30,250	180	0	5	0	185
Activity Fuel		863	1,806	150	0	0	1,956
Fuels Treatment (mechanical & other)							
Natural Fuel		4,110	0	0	100	0	100
Activity Fuel		1,298	0	0	0	0	0
Precommercial Thinning (overly dense)		15,944	740	1,200	314	246	2,500
Reforestation							
Planting		6,215	1,089	401	494	276	2,260
Timber Sales							
Fire Salvage		0	0	0	0	0	0
Salvage for Fuels Reduction		10,000	0	0	0	0	0
Commercial Thinning (overly dense)		65,986	1,272	640	172	48	2,132
Other Forest Health Related		26,484	0	0	343	0	343
Riparian Restoration Projects Outside Stream		5,133	35	41	20	0	96
Noxious Weed Control		17,250					
Herbicide			100	1	0	0	101
Biological			50	0	5	0	55
Mechanical/Manual			5	4	297	0	306
Road Obliteration** - miles	629		1	89	0	0	90
Road Closures - miles	172		12	0	15	0	27
Subsoiling		560	68	13	0	0	81
TOTALS	801	184,093	5,357	2,539	1,765	570	10,232

*Total acres needing treatment are those acres outside of desired conditions and "available" for treatment, considering land allocation.

LSR's and wilderness may be available depending on type of activity.

**Road obliteration done for hydrological stability, "hydrologically maintenance free".

Evaluation

This is the third year for reporting forest health restoration activities. Further refinement and verification is still needed to:

- Accurately display the total available acres needing treatment, and
- Provide consistency with other reporting documents.

After completion of this year's monitoring report, the forest health spreadsheet will be critiqued to improve display and accuracy of the information.

The value of this spreadsheet is to point out broad areas where the resource is outside the desired condition and our rate of progress in treating that need. Currently there are several areas of concern on the forest regarding forest health as indicated on the spreadsheet.

- More than 15,000 acres of overly dense, young stands are in need of precommercial thinning, with 15-25% of the need treated each year.
- More than 64,000 acres of overly dense stands are in need of commercial thinning with less than 5% of the stands treated.
- More than 17,000 acres of noxious weed problem areas are identified with less than 5% of the acres being treated.
- Several hundred miles of road have been identified for decommissioning, yet only a small percentage have been treated due to funding shortages.
- There are large amounts of natural fuel accumulations, especially in the Badger Creek wilderness. Only a small percentage of the need is being treated forestwide.

Forest Inventories

Ecological Unit Inventory

A multi-scale ecological unit inventory is being conducted on the Forest. The objective of the inventory is to classify and map ecological units based on relationships of climate, geology, geomorphology, soil and vegetation properties that determine ecological potentials, ecosystem capabilities and predicted responses. Inventory work is being completed at the landscape scale to facilitate land management planning analysis work. Work is also being completed at the land unit scale to validate and refine landscape level concepts. This hierarchical framework for defining ecological units at different scales provided by the inventory products allows a scientific basis for implementing ecosystem management principles at different levels of land planning.

Land unit mapping was completed on 10,000 acres in 1999.

Evaluation

There is an active schedule for inventories to validate or improve current data. The Ecological Unit Inventory is coordinated out of the Mt. Hood Forest Headquarters; however, staffing for this project came from Hood River and Barlow Ranger Districts. Additional staffing will be needed in order to accelerate the inventory. At the current rate of accomplishment, the Ecological Unit Inventory for the forest would take another 20 years.

Model Assumptions

Timber yields in our Forest Plan were generated from lands that are considered suitable for timber harvest. They are generally described as:

- No regulated harvest lands (“A” lands);
- Regulated harvest with partial yield (“B” lands);
- Regulated harvest with full yield (“C” lands);
- Bull Run Watershed Planning Unit (“D” lands);

Within these four categories are the 45 management areas the Forest is divided into. Part of our monitoring effort is to monitor the amount of acres harvested within each of these management areas, or major categories of areas. The results are shown below in terms of percent of harvested acres that lie within management area categories.

Table 25. Percent of Acres Harvested by Management Area Category

*Fiscal Year	Mt. Hood NF Land Allocations			
	A	B	C	D
91	2	46	42	10
92	.3	40.2	52.5	7.0
93	.6	45.6	50.9	2.9
95	1.0	62.3	36.7	0
96	0.8	68.9	30.3	0
97	4.5	40.9	54.6	0
98	11.0	41.0	48.0	0
99	0	33.7	66.3	0

* FY 94 data is not available.

A = No regulated harvest (salvage).

B = Regulated harvest with partial yield.

C = Regulated harvest with full yield.

D = Bull Run Watershed Planning Unit.

Of the total acres harvested in FY 99, the following displays the percentage split between Northwest Forest Plan land allocations:

Administratively Withdrawn	0%
Late Successional Reserves	0%
Riparian Reserve	0%
Matrix	<u>100%</u>
Total	100%

Accomplishments/Results/Recommendations

Table 26. Acres Harvested by Forest Plan Management Area in FY92-FY99 (Data not available in FY 94)

	Mt. Hood NF LRMP Management Area	Acres Harvested by FY						
		92	93	95	96	97	98	99*
A4	Special Interest Area	6			14	13	372	
A5	Unroaded Recreation		14	12				
A6	Semi-primitive Roaded Recreation	3	5					
A7	Special Old Growth						95	
A9	Key Site Riparian	7				75		
A10	Developed Recreation						14	
A11	Winter Recreation Area			9				
A12	Outdoor Education Area		3					
B1	Designated WS&R Rivers		6	30	20	11		
B2	Scenic Viewshed	1,167	689	644	597	197	876	206
B3	Roaded Recreation		15	4				
B4	Pine Oak Habitat Area	179	288		98	268	366	282
B6	Special Emphasis Watershed	465	470	306	70	62	169	191
B8	Earthflow Area	57	104	125	347	119	191	106
B9	Wildlife/Visual Area	28	63		26	136		
B10	Winter Range	182	34	153	3		156	112
B11	Deer and Elk Summer Range	11	28				23	
B12	Back Country Lakes					3		
C1	Timber Emphasis Area	2,723	1,896	744	510	1,064	2,104	1,762
DA1	Bull Run Physical Drainage	98	13		0	0		
DA3	BR Research Natural Area	43	45					
DB8	BR Earthflow Area	19						
DC1	BR Timber Emphasis Area	202	49					
	Total	5,190	3,722	2,027	1,685	1,948	4,366*	2,659

* Note: The number of acres indicated here are lower than the figure for acres harvested that is displayed earlier in this monitoring report. The acres displayed here are calculated from GIS map layers. Sometimes the mapping is adjusted to fit existing vegetation cells and may be slightly different than the actual harvest unit acres reported in the timber sale tracking.

Evaluation

This comparison allows the manager to see where harvesting has occurred according to the Mt. Hood Forest Plan land allocations. As displayed in the previous table, two-thirds of the total harvest occurred on C-1 Timber Emphasis lands. The other third occurred on “B” lands. No harvest occurred on “A” lands. In FY99 there was a much greater proportion of harvest on “C” lands than in previous years.

Recommendations

- Spatially display, forestwide, a vegetation map identifying overly dense stands with forest health concerns.
- Continue to pursue funding for those items that are needed to restore and maintain forest health. These include:

Timber stand improvement dollars for precommercial thinning of overly dense, young stands.

Sale planning and preparation funds for commercial thinning of overly dense stands, and funds to thin stands of small diameter that do not make an economical timber sale.

Noxious weed abatement funding.

- Road decommissioning funding.

Update Monitoring Plan to incorporate Northwest Forest Plan direction focusing on a few critical items. These focus items would include:

- Effectiveness of silvicultural prescriptions in meeting given ecosystem objectives.
- Acres harvested where the objective was to accelerate development of late successional habitat.
- Acres treated within Riparian Reserves by objective.

Accomplishments/Results/Recommendations

- Amount of Late Successional/Old Growth by watershed.
- Continue to aeriually monitor insect activity on the east side of the forest and augment with on the ground observations.
- Continue current reforestation practices, including animal damage control, to meet 5 year regeneration and minimum stocking laws.
- Pursue accelerating the Ecological Unit Inventory. Funding has been requested for FY2001 to complete the larger scale Land Type Association mapping. These funds have been requested to accelerate Land Type mapping to a rate that will complete inventory of the forest in 5 years. Consolidate and coordinate with other inventory needs where possible.

Monitoring Element: Scenic Resources

This report covers scenic monitoring for two sale projects on the Hood River Ranger District. Projects included in this report are Mt. Defiance I and Mt. Defiance II. Monitoring included both a review of pertinent planning documents as well as a field review of post harvest units. No other visual quality monitoring was reported.

Monitoring Activities

Both projects had harvest units that were to be harvested by cable logging systems which could create undesired visual contrasts due to cable corridors (contrasting lines in a natural appearing landscape.) Mitigation measures were followed (orientation of cable corridors away from critical viewpoints and minimizing the width of cable corridors) and, therefore, the background Partial Retention Visual Quality Objective (as seen from Hwy 35) was met.

Monitoring Element: Recreation Resources

Goal

The Forest will strive to provide a broad range of year-round, high quality developed, dispersed, and primitive recreation opportunities.

Monitoring Items

In 1999 there were approximately a total of 5 million visits to the forest, primarily from the 1.5 million persons that live adjacent to the forest. In order to meet the diversity of demand that exists and continues to grow, funding issues will have to be addressed to meet the challenge.

Trails

The Forest has approximately 1,230 miles of recreation trails. This includes about 200 miles managed for cross-country skiing and snow machine use. Of the hiking trails, 363 miles are in Wilderness.

In FY99 we reconstructed 6.3 miles of existing trail. This is about one-tenth of the amount projected in the Forest Plan.

The FY99 maintenance report indicated that 44% of our trail system miles were maintained to standard. Trails maintained to standard was 375 miles. Trails not maintained to standard was approximately 500 miles.

Situation

The Congressional appropriated trail maintenance budget, \$200,000 in FY99, is less than one-half of the level that is needed to maintain the trail system to the prescribed standard level. The funding for trail construction and reconstruction, \$94,000 in FY99, is a quarter of the level that is needed to reconstruct a deteriorated system or build new opportunities.

The forest will continue to participate in the Fee Demonstration Project by collecting parking fees at selected trailheads. The funds, \$50,000 in FY99, are providing money that will be used to improve and maintain the trail system. This is eighty percent of the fees collected under the Fee Demonstration project within the forest.

The inability to catch up the trail maintenance backlog increases the amount of trail that will deteriorate to a level that requires more expensive reconstruction to bring them to a safe and acceptable level.

The forest will close some trails and restrict the type of use on others if current trends of reduced maintenance and reconstruction continue. Fewer new facilities will be constructed because more of the limited capital investment dollars will be needed to reconstruct trails that were not properly maintained. Currently, there are a limited amount of trails available for barrier-free, bicycle and off-road vehicle users. These systems will feel the greatest impacts from lack of new facility construction.

Wilderness

There are six Wilderness areas on the Forest covering approximately 186,000 acres. Wilderness management emphasizes not only the preservation of the areas primitive characteristics, but also the restoration of areas that have lost their primitive character through overuse.

A mandatory use permit system is being used on the Mt. Hood, Salmon-Huckleberry, and Columbia Wildernesses. The purpose is to obtain more accurate information on use levels and patterns, and to educate others on Wilderness ethics and values. Rescue transponders have aided the effort to save lives during search and rescue operations.

- Wilderness Use = 32,000 Visitor Days.
- Climbing on Mt. Hood = 15,000 Visitor Days/Year
- Number of authorizations for non-conforming uses was 2, same as last year.
- Number of wilderness search and rescues equaled 8, up from 6 last year.
- Wilderness Implementation Schedules are completed but not implemented.

The Limits of Acceptable Change (LAC) process for Mt. Hood, Salmon-Huckleberry and Hatfield Wildernesses has been completed. Environmental Assessment alternatives were drafted that proposed changes in management actions that included a limited use permit system, designated campsites and campfire restrictions to bring the wilderness into compliance with standards.

The proposal included amending Forest Plan Standards and Guidelines for campsite location and size. The proposal suggested revising the Wilderness Recreation Spectrum Allocations to more accurately reflect conditions at the time the Wilderness was designated. An extensive public review process is planned for FY 2000.

No funds were dedicated to wilderness restoration activities.

Wild and Scenic Rivers

Congress has not appropriated funding for suitability studies of the remaining 10 identified eligible rivers. In all cases, attributes that could lead to potential classification as a Wild and Scenic River are being protected on Federal lands. The forest completed the last management plan for all designated Wild and Scenic Rivers in 1994.

Developed and Dispersed Recreation

The Mt. Hood National Forest is literally the backyard of the Portland/Vancouver metro area and the Willamette Valley. The forest has a variety of developed sites that total over 150 sites. These sites are being operated at the maximum capacity of 1.6 million Visitor Days. Facility backlog rehabilitation and reconstruction estimated at a cost of 1.5 million dollars are a major concern at maintaining this level of use.

Dispersed Use Recreation had approximately 600,000 Visitor Days in FY99. There are about 1,600 people camping on the forest every day in non-designated sites during high use season (6 months). These sites do not have sanitary facilities and unacceptable damage to the environment occurs because of the lack of control.

Concessionaires are operating all of the fee campgrounds. The concessionaires operate day use sites associated with these facilities and charge a fee. Funds collected by the Forest are for the Treasury with 25% of the receipts returned to County governments. Counties received \$232,315 in FY99 from the recreation program.

Recommendations

- Amend Forest Plan use expectations/quality of experience anticipated to reflect current decline in budget levels. Amend Forest Plan projects to reflect current budget limitations during Forest Plan revision process.
- Continue to emphasize trail rehabilitation and maintenance. Develop a Forest Trail Management Plan to help insure effective utilizing of our resources with respect to our users needs. Complete the trail portion of the Travel and Access Management Plan.
- Explore alternative ways to finance trail work, continue participation in the Recreation Fee Pilot Project which will allow the forest to retain at least 80% of parking fees collected at selected trailheads. Encourage partnership arrangements to help accomplish needed work.
- Explore opportunities for adding to concessionaire operations a limited number of dispersed sites that need management action to prevent resource damage.
- Continue permit system and data collection. Start the Limits of Acceptable Change (LAC) planning process on the Bull of the Woods Wilderness to validate carrying capacities, and recommend new Wilderness resource opportunity spectrum classes, and associated Standards and Guidelines. Continue the LAC planning process for the Badger Wilderness. Amend Forest Plan to reflect changes needed.
- Complete the Prescribed Natural Fire (PNF) planning process for the Badger Wilderness.
- Postpone, due to budget limitations, suitability studies on the 10 identified eligible rivers.
- Complete the Meaningful Measure data base to provide a means of allocating and prioritizing recreation funds.
- Complete condition surveys on all recreation facilities over the next five years to provide a more accurate estimate of annual maintenance, deferred maintenance and capital investments.

Chapter 3 Financial Review



Chapter 3

Financial Review

The purpose of this monitoring item is to track funding levels necessary to achieve the outputs predicted in the Forest Plan. The following display compares expenditures proposed in the 1990 Forest Plan with actual expenditures for fiscal year 1999 (October 1, 1998 to September 30, 1999). All figures are rounded to the nearest thousand dollars.

The total budget predicted for full Forest Plan Implementation was \$65,275,000; actual funds expended in FY 99 was \$25,745,000. Approximately 7% of the expenditures in FY 99 were for flood damage repair work from the 1996 and 1997 floods. Table 26 identifies the major expenditure groups and does not reflect total cost incurred on the forest.

Each year, Congressional budgets move the forest towards the many desired future conditions identified in the Forest Plan. The annual program is an incremental step toward implementation of the goals and objectives set forth in the Plan. Outputs and activities in individual years will vary due to changing conditions and Congressional budget appropriations.

Figures 5 and 6 show a significant change as related to the total forest budget and workforce (Full Time Equivalent = FTE) since 1990.

Financial Review

Table 27. Budget Levels Predicted/Actual (Partial List)

Activities	*Forest Plan Predicted (thousands/var)1990	**Actual Expenditures (thousands)				
		FY 95	FY 96	FY 97	FY 98	FY 99
Fire						
• Brush Disposal	3,056	995	758	632	426	547
• Fire Fighting Fund	2,118	1,119	2,145	2,520	2,187	2,173
Engineering						
• Timber Roads	2,709	244	292	518	586	1015
• Recreation Roads	1,381	103	53	103	104	(Timber, Rec & Gen.Pur)
• General Purpose Roads	118	575	56	151	16	
• Recreation Facilities	1,751	424	293	499	599	152
• Trail Construction	1,279	606	253	534	346	383
• Road Maintenance	4,079	1,874	1,030	1,139	965	943
• Facilities Maintenance	478	271	222	230	264	375
Timber						
Salvage Sale Funds		5,918	6,647	4,696	2,501	2,950
• KV Funds	9,602	4,362	4,566	4,126	2,925	2,890
Forestland Vegetation	2,792	2,610	1,969	2,331	1,855	1,481
• Genetic Tree Improvement						
• Reforestation						
• Timber Stand Improvement						
Timber Sale Management	5,270	1,222	2,279	2,465	3,798	2,909
• Sale Administration						
• Sale Preparation						
• Silvicultural Exams						
Administration						
• General Administration	3,318	2,114	489	1,276	1,479	1,095
Recreation/Lands						
• Land Acquisition	50	521	7	128	23	8
• Cultural Resources	459	70	55	78	90	83
• Land Line Location	10	0	0	0		
• Trail Maintenance/ Recreation	5,924	2,036	2,045	1,692	2,021	1,640
Fish/Wildlife/ Range/Soil/Water						
• Fish-Anadromous	986	768	644	491	557	584
• Fish-Inland	365	130	76	92	141	161
• Wildlife	809	202	224	256		302
• Threatened, Endangered Species	642	242	224	154		188
• Range Betterment	4	3	4	1		1
• Soil Inventory	112	152	60	30		128
• Range Vegetation Management	73	14	11	18	23	27
• Soil/Water Administration	1,726	534	266	289	296	271
• Ecosystem Management		1,671	1,806	999	888	439

* Not adjusted for inflation.

** Additional costs are incurred in a variety of areas including Forest Health, Highway Administration, Quarters Maintenance, Agricultural Research, etc. Total expenditure was \$25.7 million.

All resource areas are experiencing a funding shortfall from those projected in the Mt. Hood Forest Plan. Unit costs are being scrutinized annually to keep costs as low as practical and to provide flexibility for prioritizing and accomplishing as many projects as possible.

The heaviest programs impacted by budgetary shortfalls are in the areas of timber and associated engineering programs. However, in those cases in which a budget shortfall is a material factor causing us to more slowly meet Forest Plan objectives, it is so noted in the narratives for the specific program.

Recommendations

- Continue to scrutinize unit costs, overhead costs, staffing levels and charge-as-worked given declining budgets since 1990.

Accountability

In 1997 the Forest Service embarked on a huge effort to increase the agency's accountability in financial management. A new financial system was started in FY 98 called Foundation Financial Information System (FFIS).

Figure 4. Mt. Hood National Forest Budget Trends

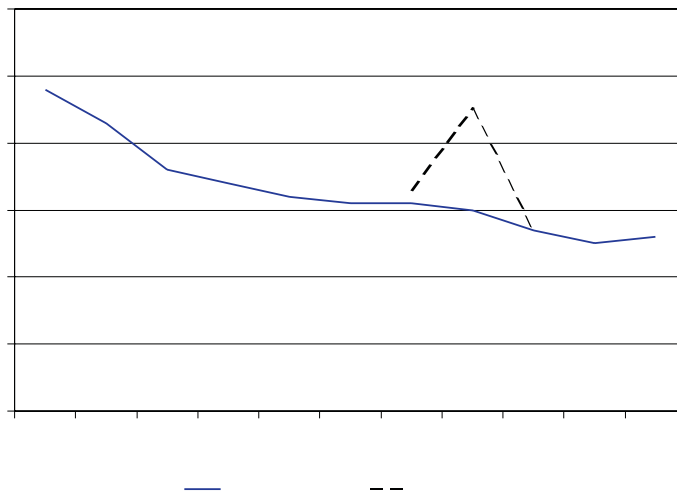
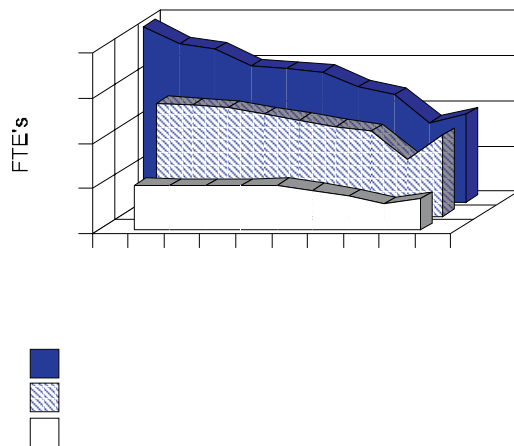


Figure 5. Mt. Hood National Forest FTE/Position Usage



Chapter 4 Forest Plan Amendments/ Interpretation Process



Chapter 4

Forest Plan Amendments/ Interpretation Process

As we continue to implement the Plan, it is apparent that amendments and clarification of direction is continually needed if we are to meet the expectation and desires of the public.

New information identified through the monitoring program will continue to be evaluated. The need to change the Forest Plan will be reviewed in accordance with the National Forest Management Act regulations and the Northwest Forest Plan Standards and Guidelines.

Amendments

An important aspect of keeping our Plan an up-to-date living document is the preparation of amendments. Based on analysis of objectives, standards, monitoring and constantly changing conditions, the Forest Plan will need to be amended from time to time. Some of these amendments may involve significant changes and will require an Environmental Impact Statement to be completed. Other changes, however, will require only minor adjustments and an Environmental Assessment may be adequate.

As of September 30, 1999 twelve amendments have been made to the Forest Plan. Five reflect changes made during Wild and Scenic River planning, one concerning noxious weed management, one adjusting a Research Natural Area Boundary, one responding to Elk Habitat Enhancement needs, one dealing with standards and guidelines relating to management of Habitat for Late Successional and Old Growth Related Species within the Range of the Northern Spotted Owl, one that expanded Mt. Hood Meadows ski area permit boundary, one Congressional Act that modified activities within the Bull Run watershed, and one that designates Timberline Lodge and its immediate environs (approximately 5 acres) as a Historical Special Interest Area - A-4.

The twelve amendments are:

- Big Bend Mountain Research Natural Area boundary change (within the Bull Run Watershed). 10/3/91
- Clackamas Wild and Scenic River EA and Management Plan - delineates final river boundary and removes all National Forest land within the river corridor from “regulated” timber harvest. 4/19/93
- Salmon Wild and Scenic River EA and Management Plan - delineates final river boundary and eliminates “regulated” timber harvest within the corridor. 3/10/93
- Lemiti Elk Habitat Enhancement Project - exchanges an existing Roded Rec. Management Area at Lemiti Creek with an adjacent Deer and Elk Summer Range Management Area. 5/17/93
- Roaring National Wild and Scenic River EA and Management Plan - delineates final river boundary and modifies management direction within the corridor relating to recreational developments, timber harvest and commercial livestock grazing. 9/13/93
- Upper Sandy National Wild and Scenic River EA and Management Plan -delineates final river boundary and eliminates “regulated” harvest within the corridor. It provides replacement management direction for the new A-1 allocation. 2/24/94

- White River National Wild and Scenic River Management Plan - delineates final river boundary which included the adjustment of the river corridor termini to include White River Falls. It also modified management direction in relation to recreational use, timber harvest, and road construction among other site specific management activities. 11/3/94
- Record of Decision for Amendments to Forest Service and Bureau of Land Management planning documents within the range of the Northern Spotted Owl - this decision amends current land and resource management plans with additional allocations and standards and guidelines. 5/13/94
- Environmental Assessment for Management of Noxious Weeds - Mt. Hood National Forest - this amendment clarified noxious weed management objectives by adding missing statements pertaining to noxious weed management under Goals, Desired Future Condition and Resource Summary sections of the Mt. Hood Forest Plan. 12/8/93
- The Environmental Impact Statement for the new long term conceptual master plan for Mt. Hood Meadows Ski Area expanded the ski area permit boundary by 96 acres to include an area which was being used by the ski area. It changed the land allocation for this area from a Wildlife/Visual classification to Winter Recreation classification. It also changed the Northwest Forest Plan allocation from Matrix to Administratively withdrawn. 1/24/97
- The Oregon Resource Conservation Act of 1996 changed the allocation for the Bull Run Area from Administratively withdrawn to Congressionally withdrawn. It prohibited harvesting of trees for timber management within the Bull Run drainage and prohibited the authorization of salvage sales.
- The Timberline Lodge Master Development Plan Amendment adopted the Historic Building Preservation Plan to provide the long-term management strategy for Timberline Lodge as a National Historic Landmark. The amendment also designated Timberline Lodge and immediate environs as a (Historic) Special Interest Area (A-4 Land Allocation) 11/4/98.

Monitoring has disclosed significant disparity between our amended Forest Plan and Forest conditions that would currently warrant a revision at this time. We will continue to make nonsignificant amendments to our Forest Plan as needed and expect to begin a Forest Plan Revision when the planning regulations, which are currently being revised, are finalized.

Chapter 5 Ongoing Planning Actions



Chapter 5

Ongoing Planning Actions

The Mt. Hood Forest Plan as well as the Northwest Forest Plan implementation process is now well underway. As we move further into the implementation phase, we do our best to meet the intent of the Plans. In addition to site specific project analysis, several additional planning and monitoring actions are continually taking place.

Northwest Forest Plan

Introduction

Implementation of the Northwest Forest Plan, also titled the Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl, began in 1994. There are four primary components of this plan that the Mt. Hood NF is involved in:

- Watershed Analysis,
- Watershed Restoration,
- Implementation Monitoring, and

- Northwest Economic Adjustment Initiative

Extensive energy has been focused on the following areas during this past year and is summarized in the following paragraphs.

Watershed Analysis

Watershed analysis is an intermediate analysis between land management planning and project planning. It provides analytical information about ecosystem functions, structures, and flows in the watershed, including past and current conditions and trends. The result will be a scientifically based understanding of ecological interactions occurring within a watershed as they relate to specific social issues.

Watershed analysis is purely an analysis step and does not involve NEPA (National Environmental Policy Act) decisions. Given the desired future conditions, goals and objectives, management area boundaries, and standards and guidelines, which come from the Forest Plan and the Northwest Forest Plan, watershed analysis is a tool to help identify and prioritize Forest Plan implementation actions.

Information gained during watershed analysis may show that a Forest Plan amendment is necessary. When this is the case, and the Forest Supervisor decides to proceed with a plan amendment, the watershed analysis may be used to support the NEPA analysis for the amendment.

The watershed analysis will normally provide information regarding existing conditions, issues, and management concerns useful during project NEPA analysis and may help in addressing the cumulative effects of multiple activities within a watershed. When this is the case, the watershed analysis may be incorporated by reference into the project NEPA document and will become part of the project record.

No additional watershed analyses were completed in FY 99. As of October 1998, approximately 95% of the Forest is covered by a watershed analysis. See map at end of this chapter. Three are expected to be completed in FY 2000. They are Columbia Tribes, West, Hood River, and Mill Creek.

Watershed Restoration/Jobs-in-the-Woods

The FY99 Jobs-in-the-Woods program continued the trend started in FY98 of decreasing the budget line item allocations for Jobs-in-the-Woods. The Mt. Hood was directed to include previously approved Supplemental Flood projects into the Jobs-in-the-Woods program. The Jobs-in-the-Woods program has been funded as follows since its inception in FY94:

Table 28. Jobs-in-the-Woods Expenditures (thousands \$)

	FY94	FY95	FY96	FY97	FY98	FY99
Total Jobs-in-the-Woods Allocation	338	600	700	720	718	539
Other funding included in Jobs-in-the-Woods Program	0	0	0	0	438	234

It is expected that in FY2000 the entire Jobs-in-the-Woods program will be funded out of other allocations. That is, there will be no separate allocation in FY2000 specifically designated for Jobs-in-the-Woods.

The FY99 program continued to contract to local businesses in timber dependent communities adjacent to the Mt. Hood National Forest. The projects contracted with the Jobs-in-the-Woods allocations included road storm proofing, road decommissioning, cattle fence enclosures from riparian areas, noxious weed treatment, instream and side channel Restoration for Fish Habitat, Riparian Vegetation planting, campground restoration, and a precommercial thinning in a Late Successional Reserve. Additional projects funded with Supplemental Flood Funds included road decommissioning, culvert replacement and instream fish habitat improvement projects.

Implementation Monitoring

A crucial component of the Northwest Forest Plan is monitoring implementation at a variety of scales. At the request of the Regional Ecosystem Office, an inter-agency regional review team was formed and they developed a process to review a 10% sample of all timber sales, road projects, restoration projects, and watershed analysis located within the area covered by the Northwest Forest Plan.

One timber sale, Round-up, on the Zigzag Ranger District was selected for review. It was a sale in a large area covered by the Abbott-Salmon EA. It was developed to address visual concerns.

The core of the review for the timber sale was an extensive questionnaire which was to be filled out for the project selected. One area of improvement was noted. The Green Tree Retention (GTR) unit was not marked on the ground and not recorded in a permanent data base. All other standards and guidelines were met or exceeded. The objective was to determine if the ROD and its standards and guidelines are being implemented.

Monitoring teams were interagency, interdisciplinary, intergovernmental and most included members of the public from the Provincial Advisory Committees. Monitoring in a public interagency environment provides an objective, open forum for the participating members to discuss adaptive management opportunities. The discourse that took place throughout the various monitoring trips resulted in increased trust among team members and an appreciation for the skills and knowledge of Forest Service and BLM employees who design and administer a variety of projects.

Analysis of the findings indicate that overall, at the Regional scale, the Forest Service and Bureau of Land Management (BLM) have a high level of compliance with the standards and guidelines related to timber sales and no major changes in management direction are warranted at this time.

In addition, other project specific monitoring trips are carried out by individual districts. These reviews consider several aspects including management and condition of roads, landings, skid trails, slash treatment, adequacy of riparian buffers and silvicultural prescription implementation. Some specific short term actions to improve on-the-ground conditions may be identified. Overall, harvested stands reflected identified prescriptions and met project objectives.

Ongoing Planning Actions

Also, continuing the Forest Leadership emphasis for monitoring, two additional projects were selected for review with the intent of moving toward an ecosystem based monitoring system. This effort focused on a forestwide compliance review of the Mt. Hood Forest Plan Standards and Guidelines and assessing whether we are moving toward our desired future conditions.

The reviews were conducted by an interdisciplinary team selected from resource specialists across the forest. The two projects were the Copper/Tin Timber Sale on the Hood River Ranger District and the Zigzag River Tributary Restoration projects on the Zigzag Ranger District.

These reviews included a variety of resource specialists, as well as the appropriate District management personnel. Specific highlights included recognizing the importance of complete documentation of actions and rationale. In addition, the close coordination between project implementation personnel and project planners was emphasized as the key to successful project completion.

The Copper/Tin project focused on lands that have experienced a defoliating infestation of western spruce budworm. The overall impression is that the area is moving toward the Desired Condition and that the project is providing a better product than was described in the EA.

The Zigzag River and Tributary Restoration projects were identified in response to the severely changed conditions caused by the floods in the winter of 1995/1996. Watershed Analysis had recommended restoration projects to respond to the changes and to better achieve desired future conditions. Projects included log and boulder placement, side-channel flow control, riparian vegetation improvements, noxious weed control, bank stabilization, fish passage structures and road closure and drainage improvements.

The projects are moving the areas towards the Desired Future condition and are very consistent with the appropriate Standards and Guidelines. The projects placed a strong emphasis on achieving the Aquatic Conservation Strategy and the National Resource Agenda.

The projects met Forest Standards and Guidelines and the reviews provided excellent cross-district information exchange of project implementation and problem solutions.

Northwest Economic Adjustment Initiative

Role and Activities in Community Development

The Mt. Hood National Forest is committed to being partners with our neighbors in a vision of sustainable development and responsible management where economic, social, and environmental progress go hand-in-hand. The Mt. Hood National Forest assists communities through partnerships, agreements, and alliances. It allows an increased capacity to improve local economic health. The following is a menu of areas and programs the forest is involved in to promote community development.

The Northwest Economic Adjustment Initiative, part of President Clinton's Northwest Forest Plan, is aimed at providing economic stability to northwest communities with ties to the timber industry. The Initiative brings the Forest Service together with eight other Federal agencies, as well as with State and local governments, for funding projects that are community priorities to help build economic and social community capacity. Specific programs include:

Rural Community Assistance

The Rural Community Assistance program on the Mt. Hood National Forest is a combination of providing technical assistance and grants to communities. In 1999 the Forest Service awarded one new grant to rural communities in the influence area of the Mt. Hood National Forest.

Government Camp Geothermal Heating District Feasibility Study

\$22,500 was granted to Clackamas County Development Agency to review a variety of alternatives for removing, storing and disposing snow in Government Camp. Geothermal capabilities will be one alternative studied. The most efficient and effective method will be studied and determined as well. The community will benefit by providing better snow removal, safe and clear walkways, and better circulation and parking in order to be attractive for private investment in the community of Government Camp.

The following existing grants continue to be monitored and administered:

Odell Downtown Revitalization Plan and Stormwater Study

\$35,000 was granted to the Mid-Columbia Economic Development District in 1998 to develop a downtown revitalization plan and stormwater drainage plan for the unincorporated community of Odell, Oregon. The community will define its vision and include the work elements required to improve the physical and economic components of Odell's downtown. The project will encourage local partnerships, strengthen community bonds, develop local capacity and identify critical resources, which will foster long-term civic pride and stewardship. The stormwater drainage facilities plan will provide engineering and funding alternatives that the community will use to seek financing for final design and construction of stormwater infrastructure.

Mt. Hood Towne Hall Architectural and Engineering Report

\$10,000 was granted to Hood River County in 1998 to obtain a professional engineering and feasibility report for rehabilitation and adaptive use of the historic Mt. Hood Towne Hall as a multiple use, accessible community center.

Bear Creek Trail Engineering and Design Project

A \$60,000 grant was awarded to the City of Molalla in 1998 to complete:

- wetland delineation and biological identifications;
- wetlands mitigation planning;
- engineering and design of trailhead parking, ADA accessible trail, and signage; and
- a fund-raising strategies for construction.

This project is being accomplished in conjunction with a mill site conversion project.

Molalla Main Street Revitalization Project

A \$22,500 grant was awarded to the City of Molalla in 1996 to revitalize downtown Molalla using the Livable Oregon Main Street four-point approach. Through public involvement and outreach, needed improvements within the city park system were identified as an integral component of community revitalization. The revised project is to design a rest room and concession stand facility in Clark Park.

Technical assistance to rural communities involves Forest Staff providing information, support and/or educational training opportunities that assist communities to build economic capacity. In 1999 the Mt. Hood National Forest provided technical assistance to the Juniper Flat Rural Fire District in Pine Grove by conducting sensitive plant and animal, and cultural resource surveys on a proposed fire engine storage site.

Jobs-in-the-Woods

Creates restoration projects for displaced timber workers (refer to page 5-3).

Cooperative Agreements

The Forest partners with state, county and local governments to provide services that are mutually needed across common boundaries, or promote educational messages that will benefit our management goals. Specific programs are:

- Fire prevention cooperatives with rural fire departments working with urban interface programs,
- Road maintenance agreements with counties and state,
- Law enforcement agreements with counties, and
- Fish habitat projects utilizing the Wyden amendment.

Special Use Permits/Memorandum of Understanding

Special Use permits provide another avenue toward community development. These permits allow outside agencies and private businesses to operate on National Forest land in order to accomplish their mission. Examples include:

- Sewer system at Government Camp
- Water systems...MOU with Clackamas Water Providers
- City of Sandy and BLM MOU - Alder Creek Watershed
- American Native People Organization (ANPO) - Special Use Permit
- Oregon State Film Office - various filming permits
- City of Portland - Bull Run Watershed
- Outfitter guides provides employment and recreation opportunities
- FTV Communications Inc. - laid fiber optic cable to improve communication and service

Partnerships

Partnerships are an integral part of management of the Mt Hood National Forest and are as varied as the work they accomplish.

Some partnerships simply help us get the work done; others are involved in major collaborative and stewardship roles, becoming advocates helping to implement our natural resource agenda at the local level. Partnerships reconnect people with natural resources as they enable participants to get involved, make a difference, and learn more about their environment and their national forests.

While partnerships are not new, the Mt Hood Forest's emphasis on them and the desire to move towards partnerships that help build collaborative external relationships and embrace local communities was an area of emphasis for FY 99.

Ongoing Planning Actions

The following is but a brief sampling of people partnerships that occurred during the last year. Partners are shown in bold text. Those long termed partnerships that have spanned a decade or more are shown in bold italics.

Traditional Human Resource Programs, more aptly called Senior, Youth and Volunteer opportunities resulted in 1,150 different people accomplishing 24 person years of work valued at over one half of a million dollars in FY99.

Although accounting for only a portion of the work accomplished by partnerships, these Senior, Youth, Volunteer and Hosted Programs include:

Senior Community Service Employment Program (SCSEP). Thirteen low-income seniors provided work for the forest, earning extra income while they gained job training skills. Five seniors were successful in transitioning into private sector employment during FY99.

Two Forest Service operated Youth Conservation Corps (YCC) non-residential crews employed 18 eastside youth as a result of the Forest pooling resources with:

- Oregon Youth Conservation Corps,
- Mid Columbia Council of Governments,
- Wasco County Commission on Children and Families, and
- Northwest Service Academy/AmeriCorps.

During the eight-week summer program, the youth accomplished needed work for the forest, developed skills, earned money, and in many cases gained high school credit or a post high school education award. Recruitment information was available in both English and Spanish. The Mt Hood Forest has been proud to make it a priority to provide opportunity for youth through a YCC program for all but six years since the passage of the YCC legislation in 1974.

Ongoing Planning Actions

Hosted Programs are those manpower, job training and development programs run by other organizations that we “host” on the forest by providing a worksite. Included are hosted arrangements with organizations and local government agencies such as:

- Clackamas County Education, Training and Business Services
- Hood River County Community Corrections
- Mac Laren School
- Mid Columbia Council of Governments
- Multnomah County Community Corrections Programs
- Northwest Service Academy/AmeriCorps
- Portland State University, Teacher’s in the Woods Program
- Oregon National Guard Youth Challenge Program
- University of Oregon School of Architecture
- Wasco County Sheriff and Juvenile Department

As a result of these hosted programs, forest roads have been brushed, facilities maintained, noxious weeds removed, bioengineering projects constructed, and “as built” drawings have been developed for historic buildings.

Volunteers include both individuals and organized groups.

Individual volunteers contributed their time and effort to full time positions such as:

- Timberline Lodge Interpretative Specialists
- Clackamas Lake Guard Station Visitor Information Specialist
- Laurance Lake area host
- Hickman Butte fire lookout

Others participated in one time events or a specific project such as:

- fishing clinics,
- songbird celebrations,
- trail maintenance work days,
- PIT (Passport in Time) archeological survey projects, and
- fish and wildlife surveys and habitat improvement projects.

Enhanced Recreation Opportunities

As the Mt Hood continues to downsize, more emphasis is placed on organized volunteer groups and other arrangements where partners take an active role in recruiting, training and supervising the work. As a result, the recreating public benefits.

Playing a significant role in trail maintenance on the forest, are organized groups who provided volunteers such as:

- Backcountry Horsemen of Oregon
- Marion County Posse
- Mazamas
- Mt Hood Snowmobile Club
- Mt Scott Motorcycle Club
- Oregon Equestrian Trails
- Oregon Muleskinners
- Oregon Nordic, both Portland and The Dalles Chapters
- Pacific Crest Trail Association

Other sponsored volunteer groups helped to maintain and restore recreation sites. They include:

- Clackamas County Garden Club
- Izaak Walton League, Washington County Chapter
- Oregon Equestrian Trails
- Sierra Club
- youth organizations such as Boy and Girl Scout troops

Ongoing Planning Actions

The Friends of Timberline and Friends of Silcox Hut continued their strong stewardship roles in support of these unique, historic facilities.

The Friends of the historic Clackamas Lake Guard Station helped with the annual “Spring Cleaning” of the site as well as are working to develop a source of funds for future improvements.

Fifty-five members of the Friends of Bagby contributed almost 3,000 hours operating Bagby Hot Springs, a historic site on the south end of the forest. This partnership enables the public to enjoy a unique, quality recreational opportunity that may not otherwise be available.

Winter sport enthusiasts reap the benefits of several partnerships involved in grooming of snow trails. The Mt Hood Snowmobile Club in cooperation with the Oregon Department of Transportation, utilizes a portion of the snowmobile licensing fees to groom a wide array of snowmobile trails in the Frog Lake and Skyline Road area. Additionally, cross country ski trails in the Trillium Lake Basin are groomed by a local volunteer. Donations from the community, local organizations and retailers as well as the folks that use the trail system cover the cost of the equipment rental.

Information, Education and Outreach Activities

Other partnerships on the forest, implemented through a variety of agreements, helped us accomplish information, education and outreach activities.

The Mt. Hood Information Center, a partnership with the Mt. Hood Area Chamber of Commerce, is in its tenth year of providing “seamless” customer service. In CY 99, this jointly staffed “one stop” information center was visited by over 113,000 customers and was one of three regional visitor information centers supported by Clackamas County Tourism Development Council who administers the locally collected “room tax” dollars.

The Estacada Chamber of Commerce and the Clackamas River Ranger District operated the Clackamas River Information Center based at the district office.

Ongoing Planning Actions

The Mt Hood National Forest, Wolfree, Inc and the Bureau of Land Management (BLM) teamed up in 1993 to develop Cascade Streamwatch, a conservation education program which dovetails with school curriculum serving urban youth as well as those from the surrounding communities. “Scientists for a day... Stewards for Life” sums up Cascade Streamwatch programs that involved 45 classes and served close to 1,200 students in FY 99. Additionally, eighteen companies or organizations provided mentors who contributed 226 days sharing their professional expertise and modeling the scientific process for the students. It’s estimated that another 8,000 visitors to Wildwood Park benefitted from the environmental education facilities developed for Cascade Streamwatch as part of their use of the Park.

In an effort to ease the fishing pressure due to misidentification of bull trout (which was listed in 1998 as threatened under the endangered species), the US Fish and Wildlife Service, the Middle Fork Irrigation District and the Hood River Ranger District partnered in developing a bilingual interpretive kiosk at Laurance Lake as well as a bilingual brochure with full color graphics of fish species found in the area. This project directly benefitted the 3500 campers and anglers who visited the campground last year.

National Fishing week events including Junior Fishing Clinics have been expanded to be held throughout the spring to provide opportunities for young people to get “hooked” on the environment. More than just fishing, these events give young people hands on experience and increase public awareness of the fishery resource through a variety of environmental education activities including aquatic plant and insect identification, fly tying, a salmon tent and a costume parade. These events were held at various locations throughout the forest in cooperation with Oregon Department of Fish and Wildlife and community partners including Timberlake Job Corps Center, Oregon State Police, scout and fisheries groups as well as local merchants who generously donate prizes. The Hood River Ranger District extended outreach by publicizing their Fishing Clinic in both English and Spanish and distributing bilingual fliers to every public school student in the Hood River Valley.

Since it’s inception four years ago, more than three thousand participants benefited from Songbird Celebrations. Held on both the east and west side of the forest, these events involved more than 20 community partners and exposed participants to the global plight of migratory birds as well as shared steps that individuals can take to make a difference to songbirds in our local communities and daily lives.

Salmon Watch, a partnership with Oregon Trout, provided opportunities for school-aged students to learn about the life cycle of the Salmon, using the stream as the classroom.

The Mt Hood National Forest partnered with the Bureau of Land Management, Oregon Trout, the Audubon Society, Multnomah County Parks and Portland General Electric to host the sixteenth annual Salmon Festival, which celebrates the return of the Fall Chinook Salmon on their annual migration up the Sandy River. In addition to guided Salmon viewing walks, a wide variety of festival events were offered which emphasize the importance of healthy riparian habitat for the continued survival of this species.

Portland Unit of Mountain Rescue members volunteered to help provide wilderness education as well as climbing safety information during the spring climbing season on the popular Southside route.

Restoration

The Mt Hood National Forest has been a major catalyst in the Riverkeeper program that promotes the best stewardship of the Upper Sandy River Basin through coordination of federal, state, county and private restoration efforts. An anadromous fish-bearing tributary of the Wild and Scenic Salmon River is being restored through the efforts of:

- The Resort at the Mountain,
- Trout Unlimited,
- the Mazamas,
- US Fish and Wildlife Service,
- Oregon Department of Fish and Wildlife, and
- a variety of individual volunteers

Ongoing Planning Actions

In addition, working together to improve habitat through channel restoration, re-shaping a pond, removing noxious weeds and revegetating with native plants, as well as implementing a monitoring program along another segment of the Salmon River, are:

- Wolfree, Inc.,
- Clackamas County Soil and Water District,
- Arrah Wanna Homeowner's Association, and
- US Fish and Wildlife Service

Corbett and Central Catholic High Schools as well as the Northwest Service Academy/AMERICORPS, a national community service program, accomplished a variety of restoration and planting projects, as well as helped with the community Riverkeeper Program.

Fish and Wildlife Habitat Improvement projects occurred as a result of the efforts of a variety of individual volunteers as well as those from Oregon Hunter's Association and Trout Unlimited. Long termed habitat restoration projects continue on the eastside with the support of the Rocky Mountain Elk Foundation. On the westside, a group of hearty volunteers learned about the salmon life cycle first hand by enriching the nutrient capabilities of a short section of a local stream by placing hatchery spent Coho carcasses in the stream during several wet, cold fall days.

Volunteers with SOLV (Stop Oregon Litter and Vandalism) as well as those involved in the Mt Hood Public Lands Cleanup Day have been instrumental in sponsoring annual litter cleanups for more than a decade. Their efforts along with those of the Oregon National Guard, who has removed abandoned vehicles as a training exercise, have helped the forest reduce the impacts of careless or unlawful visitors.

The Catlin Gable School has developed a long termed partnership with the Barlow Ranger District and has helped plan and implement various watershed restoration and protection projects in the Rock Creek drainage including stream restoration, seeding, and fencing. Additionally each year various classes from Catlin Gable take on additional projects as part of their commitment to community service.

Pete's Pile Climbing Association is helping to minimize the impacts of local climbers on a rock climbing area that includes habitat for a sensitive plant species.

Monitoring

Long termed partners involved in monitoring activities include:

- Northwest Ecological Research Institute (NERI) who has partnered with the Mt Hood since 1987 to recruit, train and supervise Wetland Wildlife volunteers who monitor wildlife activities at specific wetland sites across the forest.
- Hawkwatch International, a non profit organization established in 1986, conducted their annual fall surveys to observe and band migrating raptors at Bonney Butte on the eastside of the forest. The collected data provides invaluable information about raptor population trends. In addition, an interpretative sign has been erected at the base of the Butte. Over 200 people visited the Butte, observed the birds and gleaned from the expertise of HawkWatch volunteers. Others supporting this partnership include:
 - Portland Audobon Society,
 - Oregon Department of Fish and Wildlife,
 - Boise Cascade Corporation,
 - National Fish and Wildlife Foundation,
 - Coffee People, and
 - Leupold and Stevens

Teachers in the Woods, a bevy of teachers who gained training in natural resource management while they helped collect data for needed monitoring work, completed it's fifth field season. This collaborative effort between Portland State University, the National Science Foundation and the Forest Service is extended to the classroom during the school year through the teachers newly developed field skills.

Ongoing Planning Actions

The Oregon Archeological Society has been an ongoing partner in projects which inventory and catalog cultural resource sites.

Monitoring has been built into the Riverkeeper program with groups such as Welches Middle School playing a major role with activities tied to their science curriculum.

A Deer/Elk Migration partnership project on the eastside of the forest involved:

- The Dalles High School,
- Oregon Department of Fish and Wildlife, and
- an Oregon State University student volunteer

Animals were trapped and fitted with radio collars which will be monitored to provide valuable migration information.

A national partnership with Cornell Labs, called Birds in Forested Landscapes has been implemented at the local level and involved 18 local “citizen science” volunteers who gained valuable training and monitored 12 sample points last year.

The following is a brief sampling of the partnerships that occurred during FY 99 on the Mt Hood National Forest, Pacific Northwest region. In addition to the organizations and entities listed below are the hundreds of individual partners and volunteers, which would result in a list that is too lengthy to include here.

Partners are listed once under the primary category that describes their activities even though many partners participate in a variety of programs. Those long termed partnerships that have spanned a decade or more are listed in italics.

Enhanced Recreation Opportunities

Backcountry Horsemen of Oregon
Marion County Posse
Mazamas
Mt Hood Snowmobile Club
Mt Scott Motorcycle Club
Oregon Equestrian Trails
Oregon Muleskinners
Oregon Nordic, both Portland and The Dalles Chapters
Pacific Crest Trail Association
Clackamas County Garden Club
Izaak Walton League, Washington County Chapter
Oregon Equestrian Trails
Sierra Club
Boy Scouts of America, Pacific Northwest Council Troops
Friends of Clackamas Lake Guard Station
Friends of Bagby Hotsprings
Friends of Lost Creek
Oregon Department of Transportation
Multnomah County Community Corrections Programs
youth organizations such as Girl Scout troops

Information, Education and Outreach Activities

Mt Hood Area Chamber of Commerce
Clackamas County Tourism Development Council
Estacada Chamber of Commerce
Wolfree, Inc
Bureau of Land Management
Oregon Department of Fish and Wildlife
Middle Fork (Hood River) Irrigation District
Timberlake Job Corps Center
Oregon State Police
Oregon Trout
Audubon Society
Multnomah County Parks
Portland General Electric
Portland Unit of Mountain Rescue
Parkdale School
Parkdale Fire Department
Native Plant Society of Oregon
Birds of a Feather
Mt Hood Village
Wildlife Society of Oregon
Friends of Timberline
RLK & Company

Monitoring Activities

Northwest Ecological Research Institute (NERI)/Wetland Wildlife)
Hawkwatch International
Portland Audubon Society
Boise Cascade Corporation
National Fish and Wildlife Foundation
Coffee People
Leupold and Stevens
Mt Hood Community College
Portland State University/ Teachers in the Woods
Portland State University/ Saturday Academy
National Science Foundation
The Oregon Archeological Society
Clackamas County Education, Training and Business Services
Welches Middle School
The Dalles High School
Oregon State University student volunteer
Cornell Labs /Birds in Forested Landscape

Restoration

The Resort at the Mountain
US Fish and Wildlife Service
Clackamas County Soil and Water District
Arrah Wanna Homeowner's Association
Corbett High School
Central Catholic High School
Northwest Service Academy/AMERICORPS
Oregon Hunter's Association
Oregon Episcopal School
Mt Hood Ski Bowl
Trout Unlimited
Rocky Mountain Elk Foundation
SOLV (Stop Oregon Litter and Vandalism)
Mt Hood Public Lands Cleanup Day
Oregon National Guard
Catlin Gable School
Pete's Pile Climbing Association
Oregon Youth Conservation Corp
Wasco County Commission on Children and Families
Mid Columbia Council of Governments
University of Oregon School of Architecture
Multnomah County Community Corrections Program
Hood River County Community Corrections
Mac Laren School
Oregon National Guard Youth Challenge Program
Wasco County Sheriff and Juvenile Department
Friends of Silcox Hut

Emergency Assistance Agreements

The Forest Service is often called upon to assist with emergency situations. Agreements allow us to use our expertise to help the lead agency accomplish their mission.

- Fire, floods, search and rescue - Sheriff, volunteers, local government, ODF, BLM, Confederated Tribes of Warm Springs.
- Volcano hazards - Multnomah County, Clackamas County, Hood River County, USGS.
- Participation of FS employees as volunteer First Responder crew members with the local Sheriff.

Urban Forestry

The Mt. Hood National Forest is located next to a major metropolitan area. Being involved with the community helps promote visibility and awareness, as well as attracting new partners.

- Urban Forest Coalition
- World Forestry Center - provide educational materials to teachers
- Portland City Club - member to increase Forest visibility
- Portland Chamber of Commerce - member to promote linkage with community
- Clackamas County Tourism

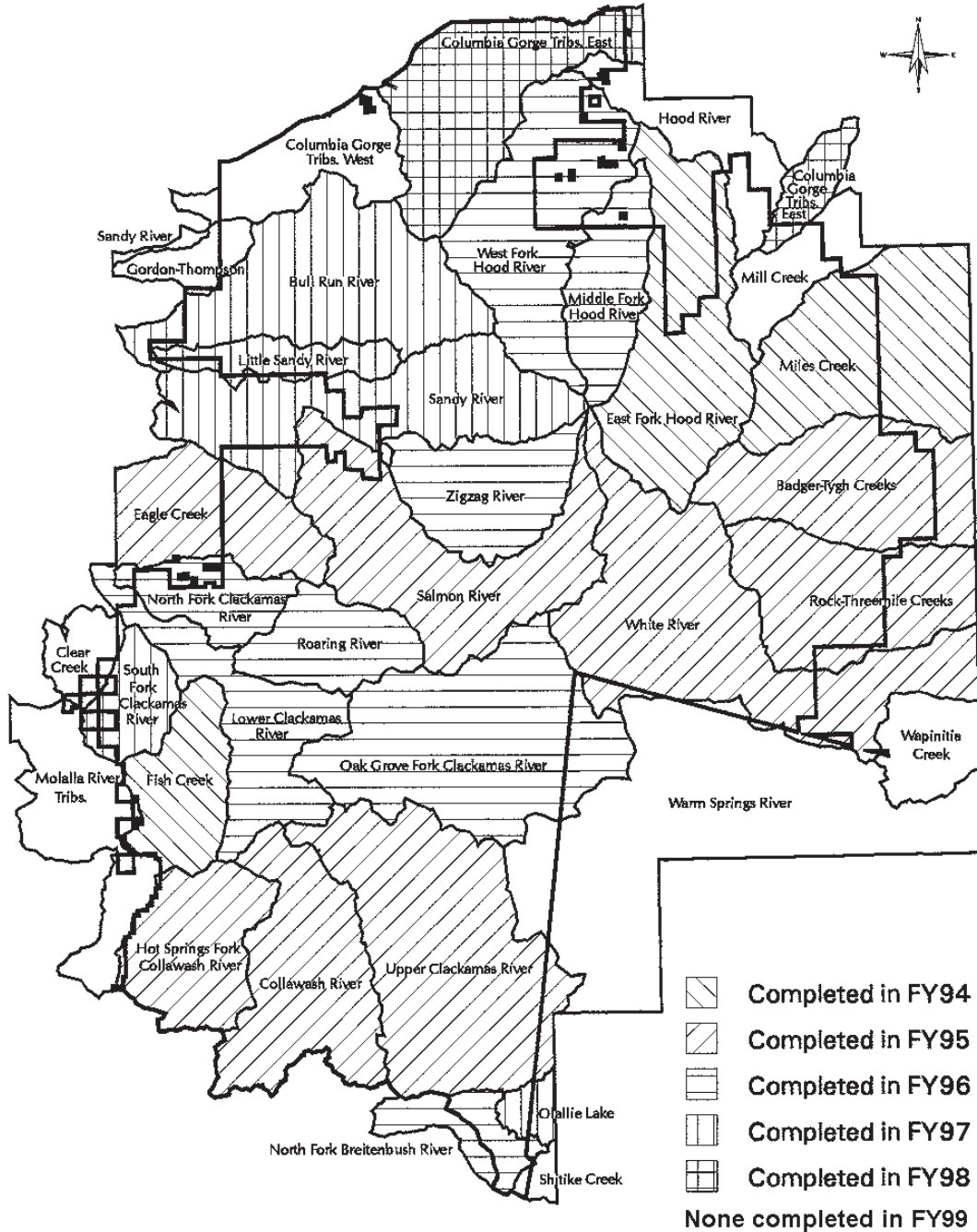
Watershed Councils

Watershed councils are voluntary local groups designated by a local government and convened by a county governing body to address the goal of sustaining, protecting or enhancing natural resources within a watershed. Watershed councils consist of a balance of interests in the watershed and are made of local people who live in the area. We participate in four of these councils.

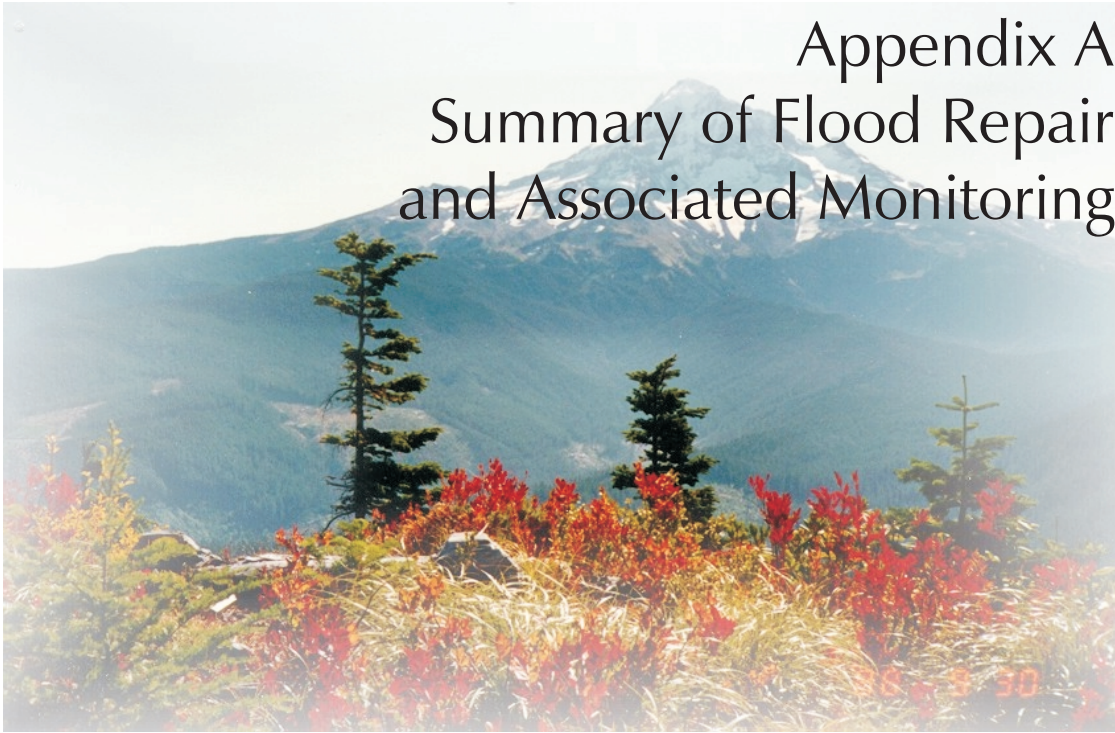
- Sandy River
- Clackamas River Basin Council
- Hood River
- Fifteen Mile Watershed Council

Ongoing Planning Actions

Map 1. Mt. Hood National Forest Watersheds Watershed Analyses Completed



Appendix A
Summary of Flood Repair
and Associated Monitoring



Appendix A

Summary of Flood Repair and Associated Monitoring

During the Fiscal Years of FY96 and FY97 the Mt Hood National Forest was heavily impacted by four separate flood events. The Forest was allocated \$24.55 million to repair the damage done by these four events. The funding came from two primary sources. Most of the road damage repair was covered by the Emergency Repair Federally Owned (ERFO) roads program. In addition to the ERFO funding, supplemental flood funds provided for the repair of riparian areas, streambanks, campgrounds, trails and some road repair not covered under the ERFO program. The table below summarizes the entire flood repair program.

<u>Fund Source</u>	<u>\$ Allocation</u>	<u># Sites</u>	<u>% Completion</u>
FY96 ERFO	10,042,000	195	96%
FY96 Supplemental	10,658,000	100	92%
FY97 ERFO	1,666,000	22	82%
FY97 Supplemental	<u>\$ 2,184,000</u>	<u>16</u>	44%
Totals	\$24,550,000	333	

The flood repair program placed its primary emphasis on completing the FY96 ERFO program to provide access to the forest via the forest roads. The projects funded by the FY96 ERFO allocation are substantially completed with the notable exception of the Fish Creek Watershed. Work on a \$1,800,000 contract repairing the flood damage in Fish Creek began in FY99. The work was 80% completed in the summer of 1999. The remainder of the work will be completed in the summer of 2000. The contract for Fish Creek included decommissioning 105 miles of road, restoring 341 road stream crossings, and restoring fish habitat on 15 miles of stream. The contract also repaired flood damage on 38 miles of road that will be retained in the watershed.

With the completion of Fish Creek, the FY96 ERFO program will be completed. Four of the 22 projects in the FY97 ERFO program have been delayed for lack of funding. These road projects were repaired to the extent that the road is serviceable, but a more extensive repair awaits additional funding.

The FY96 Supplemental Flood program is substantially complete. The FY97 Supplemental Flood program will be completed in FY2000.

Flood repair contracts are monitored during construction and after completion of the contract. All public works contracts receive a final inspection prior to the final payment on the contract. In FY99, all of these final inspections determined that the project met project specifications. In addition, photopoints have been established on approximately 20% of the projects to assist in long term monitoring. Although some minor problems such as settlement of fill embankments have been detected by this long term monitoring, no major problems have been found in any individual project.

Monitoring of the flood repair program in FY99 has shown that the program has been very successful in improving fish passage through culverts, decommissioning roads, stabilizing roads and trails, improving instream conditions for fish habitat, and allowing for the passage of 100-year storm events through road culverts.

Appendix B List of Preparers



Appendix B

List of Preparers

Blank, Myron - Planning
Cartwright, Linda - Range
DeRoo, Tom - Geologic/Mineral Resources
Dewing, Cecil - Recreation
Geiser, Linda - Air Quality
Dodd, John - Soil
Haide, Barb - Financial
Huston, Reggie - Fire
Lankford, Nancy - Timber
Loeffler, Gary/Pat Greene - Scenic
Martin, Cissy - Transportation
Hickman, Tracii - Fish
Dyck, Alan - Wildlife
Prior, Jan - Heritage Resources
Sachet, Glen - Partnerships/Rural Community Assistance
Stein, Marty - Noxious Weeds
Steinblums, Ivars - Water/Flood
York, Shelly - Desktop Publishing