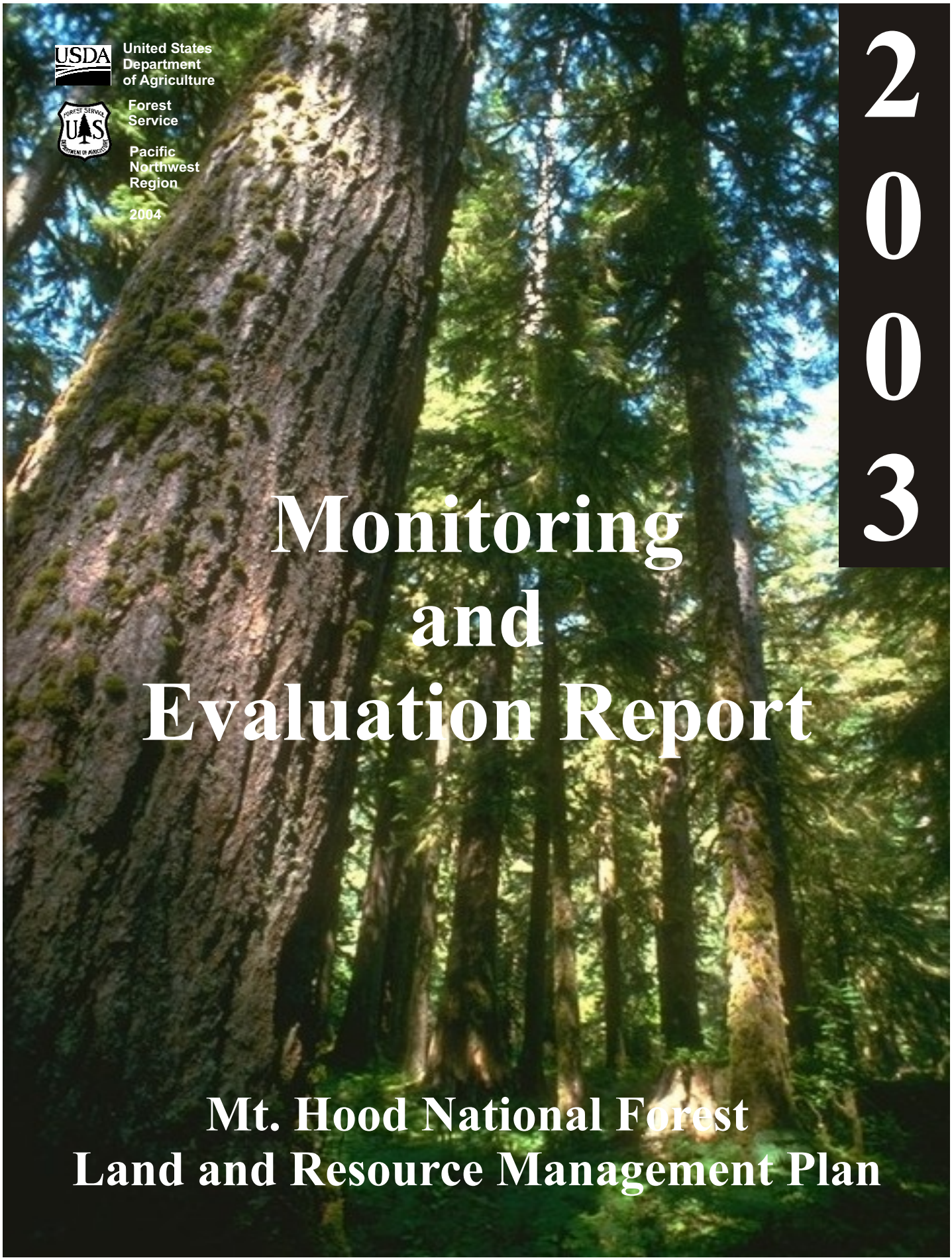

United States Department of Agriculture

Forest Service

Pacific Northwest Region

2004

2003

Monitoring and Evaluation Report

Mt. Hood National Forest Land and Resource Management Plan

Monitoring Report
Fiscal Year 2003

Mt. Hood National Forest
Land and Resource Management Plan

September 2004

This document is available online at
www.fs.fed.us/r6/mthood

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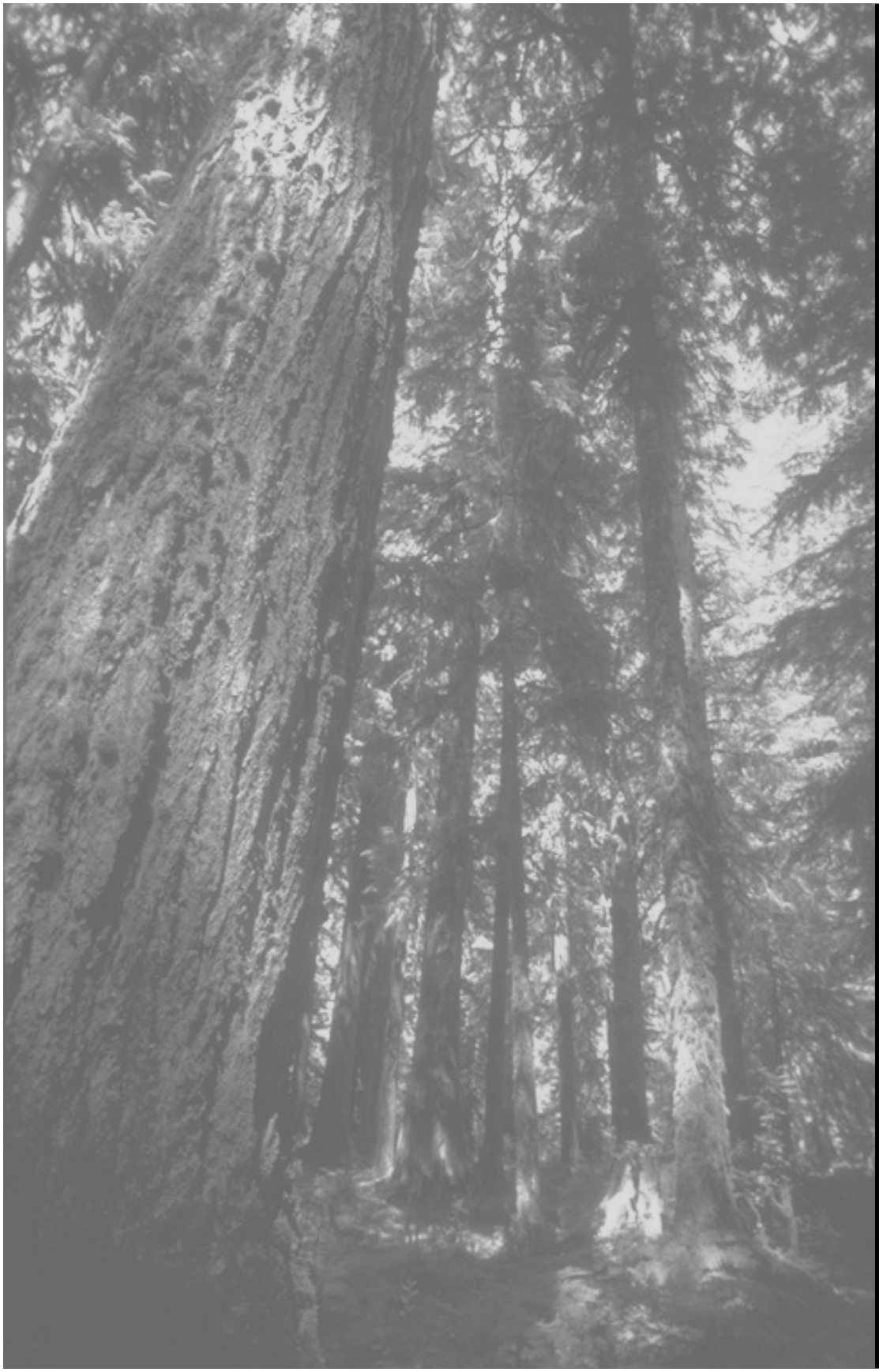


Summary

Summary

Progress Towards Sustainability on the Mt. Hood National Forest

During 1999 through 2001, the Mt. Hood National Forest, in partnership with Portland State University, participated in the Local Unit Criteria and Indicator Development (LUCID) pilot test to determine whether adopting a program of sustainability monitoring could enhance current monitoring programs at the local scale in the Forest Service. Two key outcomes of the LUCID pilot test were the use of a systems approach to monitoring and development of a locally relevant suite of criteria and indicators as the framework for the monitoring process. Using the tools and lessons learned from the LUCID test, the Mt. Hood National Forest is transitioning into a monitoring program that can answer the key sustainability questions on the Mt. Hood National Forest and build a long-term method for looking at our forest. The purpose is to enhance understanding of the ecological, social, economic and institutional conditions and trends related to the Mt. Hood National Forest in order to contribute to a continuing dialog on achieving progress in sustainable management.

The term sustainability expresses the human desire for an environment that can provide for our needs now and for future generations. Finding a specific definition of sustainability that is broadly acceptable is difficult because it is about values that vary among groups and over time. It requires decisions about what to sustain, for whom, for how long, at what cost and how. It is best achieved by optimizing the critical components of social, economic, and ecological systems. Sustainability is the understanding of all the components and their interactions. Over the past several decades, the quest for sustainability has emerged as a central theme of economic development, social policy, and natural

resource management at local, regional, national, and international levels.

There are many reasons we should care about sustainability, some of these include:

- So that the actions we take today don't compromise the choices of future generations.
- Steer us in the direction of systems thinking in our everyday management of the forests.
- To make better management decisions that would improve sustainable conditions.
- To help focus on the key issues or components helping managers to prioritize management actions and resources.
- To identify areas contributing to sustainability and areas that may be improved through adaptive management.

Changing values and demands on our forest affects ecological carrying capacity to provide goods and services. Engaging in a dialogue with our publics about what sustainability means on our forest will help to set a common understanding and vision.

- Sustainability is addressed in the 2000 and proposed 2002 planning rules as the overall stewardship goal for National Forest Systems.

Highlights for Key Resource Areas

Noxious Weeds

A total of 533 acres of noxious weeds were treated on the Forest in 2003. Emphasis continues to be placed on the treatment and detection of non-native hawkweeds, particularly satellite populations that originate from the primary infestation along the Big Eddy-Ostrander transmission line west of Lolo Pass. The primary infestation was treated with herbicides, while smaller satellite populations were manually and mechanically treated. It is expected that smaller populations will continue to be detected until the primary infestation is eradicated. Other species targeted on the Forest include hound's tongue, knapweeds, tansy ragwort, Scot's broom, English ivy, holly, Japanese knotweed, yellow star thistle and common toadflax. Knapweed is well entrenched and established across the eastside of the forest, but because of a combination of control efforts and its habitat preferences has not become widespread on the Westside. Hound's-tongue continues to spread into new areas on Barlow District but appears to be limited to this portion of the Forest.

The total area of documented noxious weed infestation on the Mt. Hood National Forest exceeds 7,000 acres. This underestimates the total infested acreage because only targeted weeds are monitored and because we do not have the financial resources to conduct a Forest-wide systematic survey. Other noxious weed species such as quack grass, bull thistle, and Canadian thistle are considered a lower priority and are typically not surveyed or treated as are tansy ragwort and Scot's broom on the Westside of the Forest.

Threatened, Endangered and Sensitive (TES) Plants

Sensitive plant species associated with non-forest habitats such as meadows, grasslands, rock outcrops, and other natural openings continue to be vulnerable to impacts from noxious weed encroachment, livestock grazing, off-road vehicles, and recreational activities. Species that grow in forested habitats appear to be stable at this time due to the reduced level of timber management that has occurred on the Mt. Hood National Forest in the recent past. In 2003, monitoring efforts were focused on non-forest habitat Sensitive plant species. Data collected will be used to develop management recommendations and/or conservation strategies for species that appear to be at risk.

Timber

Sustaining a predictable supply of forest products to the region's economic system through silvicultural treatments such as thinning and regeneration harvesting is interrelated to the ecological system. Thinning operations maintain healthy forest, reduce fire hazard/fuel buildup, improve wildlife habitat, and restore riparian habitat. Regeneration harvesting restores forests that have high levels of disease and/or mortality to younger healthy forest and at the same time provide forage for wildlife species dependant on early successional vegetation. These operations are also interrelated to the social system. They provide jobs at both the local and regional scales, as well as reduce the demand for imported forest products.

In FY 2003, the budget allocation scheduled the Forest to offer for sale approximately 24.7 MMBF (39% of PSQ). The Forest successfully offered for sale approximately 25.4 MMBF (40% of PSQ). One sale received no bidders but was re-auctioned in FY04 and has been awarded. The Forest made significant progress on one EIS and two EA's for timber sales to be offered in FY04.

The Forest is striving to provide a "predictable" level of forest products to the regional economic systems. Nationally and Regionally the Forest Service is addressing planning issues that contribute to an unpredictable supply of forest products. Locally the Forest is addressing planning issues that affect the economic viability of timber sales, which results in sales with no interested bidders. In FY 2004 to 2006, we expect to provide a diverse mix of species, sizes and quality, though the majority will be from smaller sized trees less than 28 inches in diameter. The Mt. Hood National Forest continues to plan, prepare and administer timber sales using environmentally sensitive land management guidelines.

Silviculture

Prescriptions to treat forest health concerns and provide wood products have been implemented over the last several years and continued in 2003. Timber harvest is occurring on a very small portion of the landscape. In 2003, harvest occurred on 1,029 acres, which is less than $1/100^{th}$ of a percent of the total acreage of the Mt. Hood National Forest. The majority of the harvest occurred on lands designated as Matrix in the Northwest Forest Plan, with a small percent in riparian reserves and in the unroaded recreation allocation. Commercial thinning accounted for 95% of the acres treated, shelterwood harvest 3%, and group selection harvest 2%. Overall annual growth is more than 13 times harvest and yearly mortality exceeds harvest by a factor of 8 to 1. Current and potential future forest health issues continue to be a concern on the forest. These include a backlog of overly dense, young stands in need of pre-commercial thinning, large acreages of changed ecological conditions on the

eastside as a result of fire suppression, and increasing levels of insect damage and mortality. In addition, vegetative surveys of the campgrounds have identified root disease and stem decay concerns. Recommendations are for more thinning to improve stand conditions in both the pre-commercial and commercial size classes. Other recommendations include developing a conservation and restoration plan for whitebark pine and developing long term vegetation management plans for the campgrounds.

Wildlife

Emphasis on the Forest has shifted from monitoring to survey efforts for species presence to include Northwest Forest Plan Survey and Monitoring species.

The Mt. Hood National Forest currently has no mapped lynx habitat. Lynx habitat is based on availability of adequate amounts of subalpine fir plant associations. The snow and climate conditions that support subalpine fir create favorable conditions for lynx to compete and survive. The Oregon Cascades does not have the necessary conditions to support a viable population of Canada lynx.

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 National Forest 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 may 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.

Access & Travel Management

The Mt. Hood National Forest continues to advance toward the goals of the Forest Service Roads Agenda. We are decreasing the size of our transportation system. We are maintaining or improving our mainline road system while decommissioning or closing unneeded roads. Our priority in road decommissioning continues to be decommissioning roads in unstable geological areas or roads with unacceptable environmental impacts. Due to the high cost of road decommissioning, we focused our efforts on storm proofing and closing roads, rather than decommissioning a few roads at a high cost.

Recreation

The Mt. Hood National Forest is continuing to systematically survey and evaluate the health and long-term management of the vegetation in developed campgrounds. In 2003, extensive field reconnaissance was completed in Green Canyon, Indian Henry, Knebal Springs, and Eightmile Crossing campgrounds by Mt. Hood National Forest Plant Pathologist and Measurements Specialists. The purpose of the site visit was to assess the insect and disease influences on trees in the campground and to assist in preparation of a long-term vegetation management plan.

The Mt. Hood National Forest is continuing to develop new and enhanced relationships, understanding and trust with key recreation stakeholders that represent community of interests in and around Mt. Hood. These relationships will form the basis for forging a common vision and for finding ways to work together on projects of common interest. Currently we are focused on building relationships with other public agencies, building internal support and capacity for expanded collaboration and partnerships, and developing effective tools

to communicate with the public. All activities seek to find ways for partners with common interests to create and collaborate on projects formulated to meet their respective interests and attain shared vision.

The National Visitor Use Monitoring (NVUM) project, the most thorough and reliable quantitative study in the past two decades about recreation use in the Mt. Hood National Forest was conducted during 2003. The National Visitor Use Monitoring (NVUM) project was implemented as a response to the need to better understand the use and importance of, and satisfaction with, national forest system recreation opportunities. The project will assist Congress, Forest Service leaders, and program managers in making sound decisions that best serve the public and protect valuable natural resources by providing science based, reliable information about the type, quantity, quality and location of recreation use on public lands. The information collected is also important to external customers including state agencies and private industry. Information and statistics are provided about the following topics: visitor use estimates, description of visitors, wilderness visitors, description of the visit, visitor satisfaction, crowding, use of constructed facilities and designated areas, and visitor annual recreation spending.

In 2003, the Mt. Hood National Forest prepared a written report (*Guided Whitewater Boating on the Clackamas River*, Woodcock, 2003) containing recommendations for the management of outfitted/guided boating on the Clackamas River. The recommendations are derived from the findings of a 1988 OSU (Oregon State University) study, a LAC (Limits of Acceptable Change) report prepared by the Mt. Hood National Forest in 2002, and the successful implementation of the 2002 allocation system.

Fire Management

During the 2003 fire season a total of 69 fires were reported with 30 acres impacted. The total acres affected are considerably less than the previous 2 years. Of the 69 fire starts, 84% were human caused and lightning ignited the remaining 16%. Of the total ignitions, 78% occurred in the Westside Fire Management Zone.

The application of prescribed fire to natural fuels will continue to contribute to the maintenance of healthy fire-dependent ecosystems on the forest's eastside zone. In 2003, 198 acres out of 388 acres planned were treated` for hazardous fuels.

The Cohesive Strategy for Restoring Fire-Adapted Ecosystems provides the guidelines for a step-by-step, approach to restoring ecosystems and protecting human values. The coarse-scale assessments that the Forest currently has available establish the basis for a strategy that will be refined as finer-scale data becomes available. This coarse data is in the form of Fire Regime and Condition class mapping. More accurate assessments, integrated planning processes, public input, and collaboration with other agencies, are all included in the work ahead. The Forest is working on long-term plan that addresses the need to restore fire dependent ecosystems within the Mt. Hood National Forest. Specific objectives of this plan will include:

- Modifying fire behavior to protect homes and infrastructure in the Wildland Urban Interface and municipal watersheds.

- Improve suppression ability.

This can be accomplished by fully coordinating fuel treatment program capabilities and biomass energy production potential.

Air Quality

The management activities that affect air quality by the Mt. Hood National Forest remained in compliance throughout the monitoring period (10/02 – 09/03). 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 1,574 acres were treated during the course of the period with a total of 23,372 tons being consumed. No intrusion into smoke sensitive areas occurred as result of Forest management activities. Visibility in the Mt. Hood Wilderness Class I Area was not impaired as a result of management activities. All burning operations were properly recorded and submitted to Salem Smoke Management for approval and record purposes. The Forest continues to reduce emissions from burning activities. The goal of the Forest Plan was to reduce emissions 63% by the end of the first decade of the Plan, and that was achieved.

Preparations are under way for the first revisits to 155 Forest-wide air quality biomonitoring sites established ten years ago on the 5.4 km Current Vegetation Survey grid. From 1994-1997, Mt. Hood botanists surveyed lichens and collected common species for chemical analysis. Air quality was assessed at each site using the lichen community composition (i.e., the relative proportion and abundance of sensitive vs. pollutants including nitrogen, sulfur, lead and other metals. These data are accessible from the USDS-FS-PNW Region Air Resource Management web page (http://www.fs.fed.us/r6/aq/) and serve as air quality baselines for Mt. Hood National Forest. A primary use of this ecological data (in conjunction with instrumented monitoring data) is to formulate the Federal Land Manager's response to permitting requests for new sources that could adversely affect Class I Wildernesses (Mt. Hood) or other Wildernesses or forest resources. Remeasurements of the biomonitoring plots will occur over a 2-4 year period beginning in summer 2004.

In addition to lichen monitoring, there are two other types of air quality monitoring data currently available for the Mt. Hood National Forest.

- Visibility data and chemistry of airborne particulates is monitored at the IMPROVE site established in 2000 near Government Camp, just outside the southwest border of Mt. Hood Wilderness. Data from the IMPROVE monitor can be accessed at http://vista.cira.colostate.edu/improve/ .

- The chemistry of rain and snowfall is monitored via the interagency National Trends Network – National Atmospheric Deposition program. Operation of the sole NADP monitor in Mt. Hood National Forest, located at the Bull Run watershed, was discontinued in 2003 after twenty years of service. It has been replaced by a new monitor on the Washington side of the Columbia River Gorge, in Skamania County near Washougal, co-located with a new IMPROVE site there. Data for both the Bull Run and Washougal NADP monitors are accessible from http://nadp.sws.uiuc.edu/ . A trend analysis of nitrates, ammonium and sulfate deposition is underway for the Bull Run site.

Water

With continued implementation of Best Management Practices (BMP's), watershed restoration, and the Northwest and Mt. Hood National Forest Plans, water quality and watershed conditions are expected to be maintained and in some areas show an improving trend. Water monitoring stations for water temperature and turbidity have been installed at various locations on the forest, but a number of years of data are required in order to begin assessing trends.

Summer water temperature trends are monitored by a network of 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 order to monitor current water quality condition and trends in water clarity over time, permanent monitoring stations have been installed on the Clackamas River (Carter Bridge below Fish Creek), Alder Creek (Forest boundary), and Eagle Creek (Fish hatchery). The Clackamas and Alder Creek watersheds serve as municipal water supplies. A continuous turbidity monitoring station is planned for installation on Fish Creek (USGS gaging station) by December 2004. The water monitoring stations will continuously monitor turbidity and flow depth.

The evaluation of the water quality data collected in the past several years indicates very good water quality at most of the monitoring sites, with the exception of several streams which do not meet current water temperature standards. In some cases the elevated water temperatures are naturally high, while in others a past fire or timber harvest activity may be partially responsible.

For some of the streams that have been identified as water quality limited by the Oregon Department of Environmental Quality (DEQ), Water Quality Restoration Plans, Mt. Hood National Forest watershed staff will be working with DEQ on TMDL's and providing DEQ with water quality data where available.

Fisheries

The role of Federal lands is critical in providing "anchor" habitats for rebuilding fish populations to sustainable levels. Total redd counts in 2002 were high compared to the previous three years; however, available habitat on the Forest continues to be underutilized.

The overall abundance of anadromous fish and bull trout are low in those streams and rivers monitored on the Mt. Hood National Forest. For example, over 25 miles of known steelhead spawning streams were monitored on the eastside of the Forest, and surveyors found an average of only two redds per mile. Spawning survey results on the Salmon River were better, revealing an average of nine redds per mile for Chinook salmon. As far as bull trout monitoring in the Hood River system, the distribution of bull trout has expanded significantly over the past decade, yet abundance is still quite low. The actual utilization of habitat by various fish species is far below the overall productive capacity of rivers and streams on the Mt. Hood National Forest. Therefore, Forest Service fish biologists continue to work in partnership with watershed councils across the Forest to assist in all fish recovery aspects at the whole-river basin level.

Soil

Monitoring results from the last several years suggest that progress is being made in reducing the number of harvest units where soil damage has 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 reduce impacts. Third, sale areas are located on soil types that are more resistant and resilient than past sale areas.

Key Management Issues

The following represent key management issues of concern for the Mt. Hood National Forest as perceived from the evaluation of the monitoring data. The intention is to elevate these issues to the Forest Leadership Team for consideration in the budget and program of work process. They highlight relevance to the Mt. Hood National Forest, priority for sustainability concerns, and influences which cross ecological, economic and social systems.

Impacts Related to the Shifts in Land Management and Resource Use on the Mt. Hood

Increasing population growth, urbanization, and changing demographics bringing new perspectives, lifestyles and values have influenced resource use and impacts. Over the last decade, a shift in resource use and associated impacts has become evident with the growing importance of recreation and decline in timber harvest. Along with that, there is a growing concern about biodiversity, species management and protection, and municipal water use. This affects the Forest's capacity to provide goods and services and shifts environmental impacts:

- With the decline of timber harvest, less than 1% of the land base is being treated to meet various resource objectives. The Forest is unable to provide a predictable timber supply, and forest products such as Christmas trees, firewood, and high quality boughs. Transitory range and forage habitat are becoming limited. Funds generated by timber sales for habitat improvement, road maintenance and construction projects have substantially declined with declining timber harvest.

- With the increase in recreational demands, the Forest is incurring resource and social impacts from dispersed use such as Off Highway Vehicle (OHV), target shooting, and garbage dumping, particularly on the westside wildland/urban interface. This is resulting in wildlife harassment, soil erosion, and impacts to water quality. Conflicts and impacts to riparian areas and along lakeshores are also increasing with increasing recreation pressures. Backcountry use and high elevation recreation such as snowmobiling are becoming more intrusive, impacting high elevation habitat and species. Also, current recreational user preferences are not meshing with the distribution and configuration of existing developed recreation facilities raising questions of financial sustainability.

This shift in resource use requires the Forest to explore new strategies, opportunities and funding sources to address these changes and to continue to provide for our customer needs while maintaining healthy ecological conditions. Management decisions need to incorporate social, economic and ecological considerations.

Role of the Mt. Hood on the Larger Landscape

The Mt. Hood provides unique properties (like the mountain) and contributions of species habitat in the larger landscape spanning multiple ownership and multiple jurisdictions outside of National Forest boundaries. For example:

- Given the predominance of federal land ownership making up the river basins of the Mt. Hood National Forest, the role of federal lands is critical in providing the “anchor” habitat for fish, wildlife and unique plant populations as well as protection of water quality, and long-term production and flows from the watersheds on the Forest. Management focus is shifting towards a larger system assessments.

- The Mt. Hood National Forest is committed to being partners with our neighbors in a vision of long-term sustainable community development and community capacity to address social, economic and environmental challenges.

- Increased urbanization and growing recreational demands on the Mt. Hood NF require a new model for collaborative discussions with recreation stakeholders to foster relationships, understanding and trust which help to form the basis for addressing recreational conflicts, forging a common vision and developing partnerships on projects of common interest. Mt. Hood National Forest’s unique natural properties (such as the mountaintop), landscape and proximity to the Portland metro area contribute to meeting the regional and local recreational demands.

- Fire and fuels management requires planning and implementing fuels and vegetation management projects at larger spatial scales, along National Forest boundaries, wildland/urban interfaces and across multiple ownerships.

This requires the Forest to shift into larger system assessment, working partnerships, collaborative approaches, management decisions with long-term perspectives and gathering data to support assessments of ecological conditions.

Fire

The changes in vegetative structure, species composition, and accumulated fuels have predisposed areas especially on the eastside of the Mt. Hood National Forest to insect infestation, disease and high intensity wildfires that could threaten nearby communities, watershed values and key ecological components. The key focus must be on reducing fire risk and restoring and maintaining healthy ecological conditions on high priority areas. Priority areas for restoration work should include those areas where communities are at risk and ecosystems are at risk (ecologically sensitive areas). This would require us to continue to improve our ability to assess and actively address fuel conditions, fire hazards, potential fire effects, insect and disease risk and our agency's capabilities and resources to implement work.

Noxious Weeds

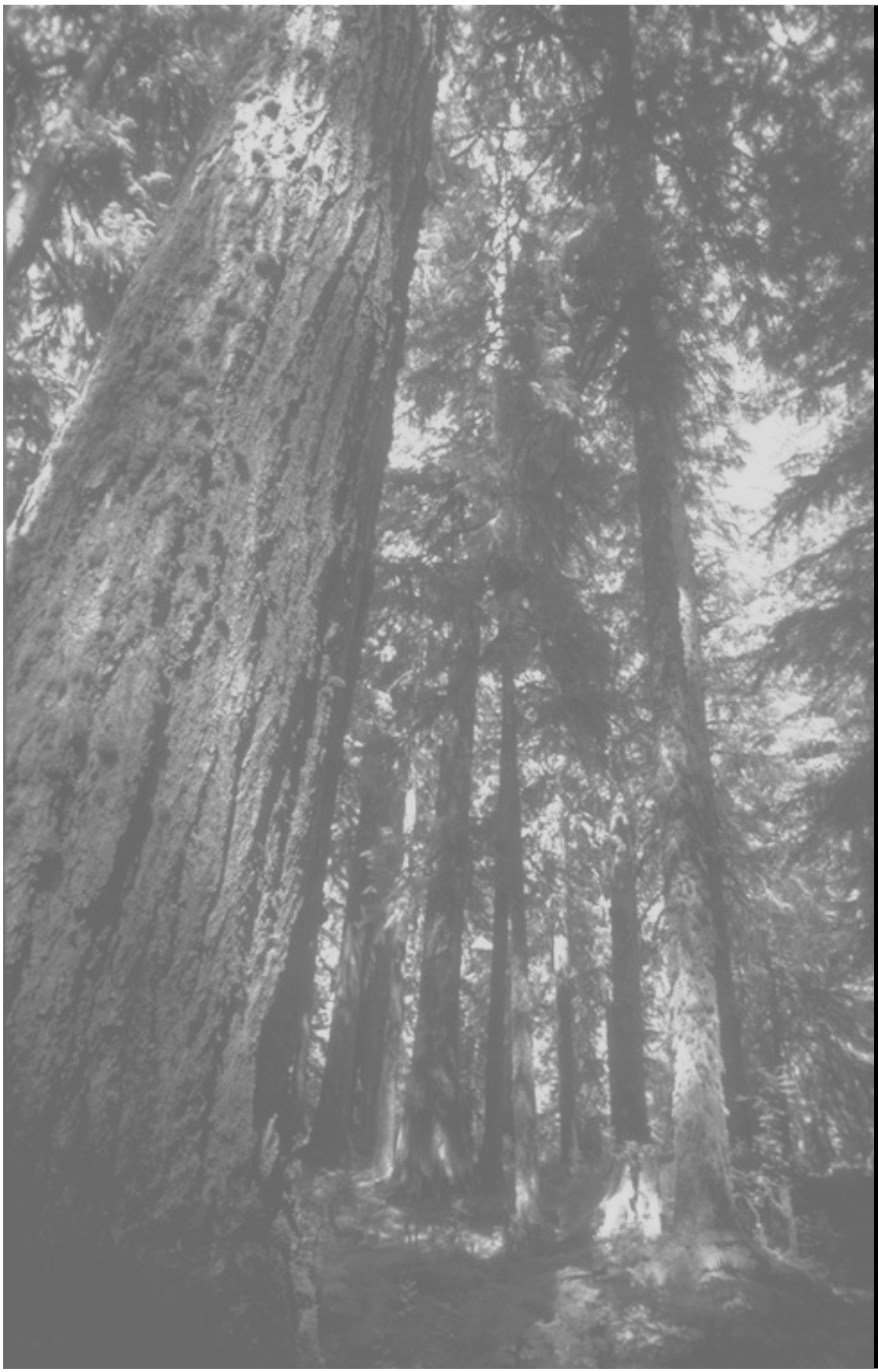
Over 7,000 acres are documented as infested with noxious weeds on the Mt. Hood National Forest. Invasive (nonnative) species are recognized by the Chief of the Forest Service as one of the four threats to National Forest System lands, as well as neighboring private, state and Tribal lands across all ecosystems. Invasive plants pose unsustainable social, economic, and ecological impacts. Scientists estimate that invasives contribute to the decline of up to half of all endangered species and are the single greatest cause of loss of biodiversity in the United States, second only to loss of habitat. To build our understanding and awareness of the extent of this growing threat on the Mt. Hood National Forest, would require us to improve our effectiveness through data management capabilities, expand our partnerships, increase applied technology and research transfer, improve collaboration and coordination both internally and externally, increase budgets, and put an emphasis on prevention measures across all agency activities.

In conclusion, 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, which are currently being written. The Mt. Hood Forest Plan is currently scheduled for revision beginning in 2008 with a Final Environmental Impact Statement issued in 2011.

Table S-1: Summary Comparison Chart (by Fiscal Year)

Element	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	Recommendation/ Comments
Fire Management												
Human caused fires	42	55	29	43	27	32	45	40	54	41	58	Continue monitoring, management direction achieved.
Natural occurring	3	11	19	2	9	38	22	1	24	14	11	
Total fires suppressed	45	66	48	45	36	70	67	41	78	55	69	
Air Quality												
Acres treated by prescribed fire	2,727	2,809	1,962	2,448	1,082	1,643	2,161	2,258	1,563	650	1,574	Continue monitoring, management direction achieved.
Geologic Resources												
Created openings on mapped earthflows	19	0	7	19	7	0	3	11	8	1	0	Continue monitoring.
Created openings on mapped landslides	16	0	3	2	0	0	1	0	0	2	0	
Mineral Resources												
Mineral material used by other agencies (cy)	23,000	5,000	82,000	191,850	25,500	216,700	76,200	85,000	63,500	0	0	Complete development plans for common variety sources.
Mineral material used by MTH (cy)	4,800	9,000	12,550	13,300	151,800	52,900	56,800	20,375	17,270	7,400	9,400	
Mineral material sold to public (cy)	910	900	1,400	1,600	865	1,160	350	319	248	474	435	
Transportation/Roads												
Miles constructed/ Forest Plan projection	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	0/16.5	0/16.5	1.5/ 16.5	1.5	Adjust Forest Plan.
Miles reconstructed/ Forest Plan projection	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	28.3/ 91.5	3.4/ 91.5	50/ 91.5	-	Adjust Forest Plan.
Road miles obliterated	47.5	47.4	29.4	38.9	84.2	27	89	18	4	2.8	18	
Timber Resources												
% timber offered of Forest Plan Total Sale Program Quantity	20	13	19	30	34.4	31	22	0	4	13.7	18.5	Initiate Forest Plan adjustment to match NFP.
% timber offered of Forest Plan Allowable Sale Quantity	23	14	22	34	39	35	25	0	4.7	15.6	21	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	0	13.8 8.8 mmbf	46.1/ 29.5	40/ 25.4	

Element	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	Recommendation/ Comments
Silviculture acres treated (harvest methods)	3,722	1,637	2,030	1,685	1,948	3,344	3,044	3,245	808	620	1,029	Continue monitoring.
Silviculture activities (Ac.) (planting, fertilizer, etc.)	8,954	7,193	12,361	9,852	6,172	7,589	5,282	3,750	7,010	6,659	2,094	Continue monitoring.
Recreation Resources												
Miles trail constructed/projections	0/6.6	5/6.6	0/6.6	0/6.6	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	12/30.5	14/30.5	21/30.5	14.8/ 30.5	14.8	63/30.5	12.7/ 30.5		2.2/ 30.5	-	Continue monitoring.
Financial Review												
Full Plan implement budget/actual expense	65.3MM 40.9MM $	65.3MM 32.7MM $	65.3MM 31.7MM $	65.3MM 30.4MM $	65.3MM 38.2MM $	65.3MM 33.7MM $	65.3 MM 39/5MM $	65.3 MM 24.7 MM	63.5 MM 25.6 MM	63.5 MM 23.2 MM	63.5 MM 17.97 MM	



Chapter 1

Chapter 1

Introduction

The Mt. Hood National Forest continues with a strong commitment to the Forest Service motto of "Caring for the Land and Serving People." Inherent in this commitment is monitoring for sustainability of our national forest. Our goal is to work with our partners in finding an appropriate balance between sustainable social, economic, and ecological systems. Our intent is to satisfy the values of the present without compromising the needs of future generations.

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 thirteenth 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 various 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 now and attempts to describe trends, in key resource areas, that are important to understanding long term effects which ultimately affect our opportunity to sustain our needs now and in the future.

Monitoring is the gathering of information and observing management activities to provide a basis for periodic evaluation. An objective of monitoring is to ensure that the Forest Plan Standards and Guidelines are being correctly applied and are achieving the desired results. Based on review of information collected, adjustments in management actions or anticipated results can be identified.

Monitoring is fundamental for us to fulfill our responsibilities as stewards of the land. The year's 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.

As we begin to move into the second decade since the adoption of the Forest Plan in 1991, we are beginning to switch the focus from short-term implementation monitoring to long-term outcomes of management with respect to key social, economic and ecological systems. This report begins the attempt to discuss the connection between short-term actions with long-term outcomes.

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

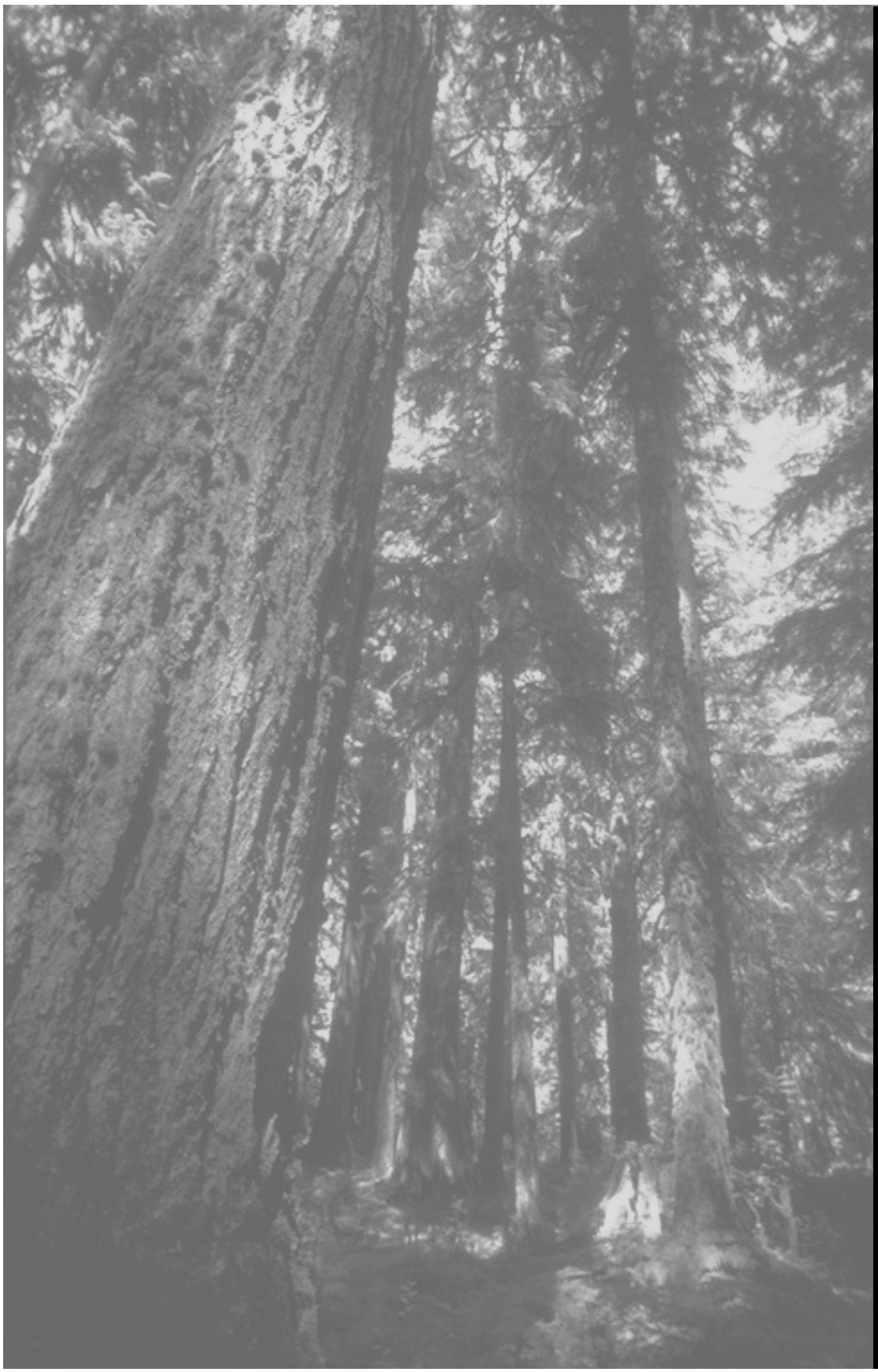
Reviews amendments made to date.

Chapter 5 – Ongoing Planning Actions

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

Although information with respect to Forest Plan implementation has been reported for approximately a decade now, continued monitoring will allow meaningful evaluation and adaptive management decisions 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 seven 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 to reflect changing management activities and priorities. The current schedule calls for revision of the Mt. Hood Forest Plan is to begin in 2008.



Chapter 2

Chapter 2

Accomplishments/Results/ Recommendations

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 wildland fire. Fire and fuels programs are to be implemented consistent with Forest Plan Standards and Guidelines, Management Prescriptions, and the Pacific Northwest Forest Plan.

The 2003 Fire Season

The snow pack for 2002 – 2003 winter was 70 to 89% of average, the precipitation summary as of May of 2003 was <50% of average. At the first of May, the Palmer Drought Index indicated near normal conditions throughout the state. By the first of September the Drought Index was showing Abnormally Dry to Severe Drought across most of the state.

A total of 69 fires were reported in 2003: 11 lightening and 58 human-caused fires. Reported burned acres totaled 30. No industrial operations fires occurred in 2003. The Forest was very successful in supporting the National fire fighting effort, dispatching a total of 229 personnel to other Regional and National fire assignments. Other fire management program activities (e.g. Prevention and Detection) were accomplished within expectations.

Monitoring Activities and Evaluation

The Forest Plan identified fire protection and 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 and results reported annually or every five years.

One area of concern deals with the numbers of human-caused wildfires and are they within levels considered in the Plan. The unit of measure is the number of wildfires, by cause, for the last five years.

Another area of concern is the number of, size of, and intensity of wildfires and are they within levels considered in the plan.

Fire Protection Objectives Monitored

Two fire protection objectives are monitored in relation to levels considered in the Forest Plan. They relate to number of human-caused wildfires and the number of, size and intensity of wildfires based on 5 years of data.

The threshold of concern is, "no more than 20% departure from the expected number per decade". The Forest Plan anticipated that the human-caused occurrence would average 559 fires/decade or 56 fires per year and an estimated average annual acreage burned by wildfire of 408 acres (MHF-LRMP Chp. 4, p. 25). For the period 1999 - 2003, the average was 47 fires per year and 90 acres per year burned. These numbers are for human caused fires only and are well below the break points established in the Forest Plan. The average number of fires and acres per year for all causes for the last five years are, 62 fires per year and 173 acres per year burned.

In 2003 there were 69 fires that impacted 30 acres. This reflects an increase of 7 acres impacted over the previous 5-year period. There was a slight decrease in ignitions from all statistical causes with an exception for fires ignited by campfires. This cause of ignitions saw a 22% increase over the previous 5 year period.

The majority of these human caused fires occurred in the Clackamas River drainage on the Forest's west slope. On July 17, the Forest implemented Public Use Restrictions on all National Forest lands. This order restricted campfires to designated developed campgrounds and prohibited off road vehicle travel. These restrictions had some effect on the number of ignitions caused by abandoned campfires but this ignition source continued to contribute to fire starts through out the summer. These restrictions were in place until September 10.

Fuel Treatment Objectives Monitored

Two fuel treatment objectives are monitored to see if they meet expected levels identified in the Forest Plan. They are desired residue (fuel) profiles and acres of hazardous fuels treated annually.

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.

Table 2-1. Fire Causes and Acres 1999-2003

Causes	Number	Percent	Acres	Percent
Lightning	72	23.3	412	47.7
Equipment Use	5	1.6	1	1
Smoking	30	9.7	20	2.3
Campfire	132	42.7	22	2.5
Debris Burning	2	.6	.1	0
Railroad	0	0	0	0
Arson	22	7.1	7	.8
Children	1	.32	.3	0
Unknown	45	14.6	401	46.4
Total	**309**	**100**	**863.4**	**100**

Table 2-2. Summary of Wildfires – Acres Burned by Size Class 1999-2003

Size Class Fires(Acres)	Number of Acres Burned by Intensity Level							Total
	1	2	3	4	5	6	Acres	
E(+200)	1	0	0	0	0	370	0	370
D(100-200)	2	0	0	0	366.1	0	0	366.1
C(10-99)	1	0	11.5	0	0	0	0	11.5
B(.26-9)	62	39.9	21.6	3.3	0	0	0	11.5
A(<.25)	243	21.8	0	0	0	0	0	21.8
Total	**309**	**62**	**33**	**3**	**366**	**370**	**0**	**834**

The goal for the hazardous fuel program is to coordinate a sound, collaborative approach for reducing wildland fire risk to communities, and to restore and maintain land health within fire-prone areas. The forest had projected to treat 800 acres annually of hazardous fuels.

Annual assessments of change in land condition (Fire Condition Class) from the previous year will determine how the goal is achieved. The 10 Year Comprehensive Strategy Implementation Plan will provide the appropriate performance measures to determine success of fuel treatments.

For the current reporting period, 198 acres out of 388 acres planned were treated. Of the 388 acres planned for treatment, there were 380 acres of piles to be burned. And 8 acres of Ladder Fuel reduction in an Urban Interface area.

Localized benefits will be realized as treatments are completed. Documentation of changes to broad long-term trends including risks to people and property, native species, watersheds, air quality, and long-term site degradation will take time. Prolonged decline of condition class especially in short interval Fire Regimes and around Urban Interface areas will show an increase in size and severity of fires. The resource damage and value lost will be expected to increase as well.

Benefits from treatment of Hazardous Fuels include:

- Improvement in the resiliency and sustainability of wildland components such as water quality, air quality, wildlife and fisheries habitat, and threatened, endangered, or other special status plant and animal species or habitat.
- Reduction in the amount of lands severely degraded by uncharacteristic wildland fire or by other disruptions to natural fire regimes.

The Forest has placed a priority on planning and implementing landscape scale fuels and vegetation management projects along National Forest boundaries. The Forest has entered into cooperative efforts with State and local landowners to provide for fuels management treatments on both sides of the National Forest boundary. Through Federal collaboration with State, Tribal, and local entities, implementation of these projects will:

- Increase wildland fire safety to the public and firefighters.
- Reduce risk of unwanted wildland fire to communities.
- Reduce risk to recreational opportunities and associated wildand attributes, view-sheds, cultural and historical resources and landscapes.
- Strengthen rural economic sustainability and increase opportunities to diversify local economies, such as through the use of biomass residues, which also reduces air quality impacts.
- Increase public education and understanding for the importance of implementing hazardous fuel risk reduction activities on both Federal and private lands.
- Help local communities with the development of Community Fire Plans.

Recommendations

- Continue to coordinate a sound collaborative approach for reducing the wildland fire risk to communities, and to restore and maintain ecosystem health within fire-prone areas.

- 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.

- Reduce hazard exposure to firefighters and the Public during fire suppression activities.

- Prioritize hazardous fuels reduction where the negative impacts of wildland fire are greatest.

- Ensure communities most at risk in the wildland-urban interface receive priority of hazardous fuels treatment.

- Continue to focus attention on condition class 2 and 3 in the short interval fire regimes.

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. In addition, Public health and environmental quality considerations will be incorporated into fire management activities undertaken for the hazardous fuels management program.

Accomplishments

The management activities that affect air quality by the Mt. Hood National Forest remained in compliance throughout the monitoring period (10/02 - 9/03). 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 1574 acres were treated during the course of the period with a total of 23,372 tons being consumed. No intrusion into smoke sensitive areas occurred as a result of Forest management activities. Visibility in the Mt. Hood Wilderness Class I area was not impaired as a result of management activities.

All burning operations were properly recorded and submitted to Salem Smoke Management for approval and record purposes using the FASTRACS system.

Table 2-3. Prescribed Burning - FY 2003

Burn Type	Acres Treated by Area				Total
	Barlow	Clackamas River	Hood River	Zigzag	
Piles	1,146	229	0	0	1,375
Underburn	183	16	0	0	199
Total Acres	1,329	245	0	0	1,574
Tons Consumed	22,335	1,036	0	0	23,372

Conclusions

The Forest Service 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 to date.

New direction from the National Fire Plan is to:

- Develop and promote efficient biomass residue uses consistent with management objectives in agency land management plans.

- Strengthen rural economic sustainability and increase opportunities to diversify local economies, such as through removal and use of biomass residues to reduce air quality impacts.

This direction provides an opportunity to further reduce emissions or increase acres treated without increasing emissions.

Range Management

Goal

On lands determined as suitable and capable of producing range vegetation and within constraints imposed by Forest Plan Standards and Guides, provide forage for use by permitted domestic livestock.

Existing Condition

Approximately 159,877 acres, or 15% of total acres on the Mt. Hood National Forest comprise 5 active grazing allotments. Vegetative composition within these allotments is a mosaic of grass and shrub lands, meadow complexes, timbered areas, and harvested lands. Harvested lands in these allotments generally produce forage for about twenty years before the trees re-grow and again dominate the site. This is called "transitory range".

Economic goods are provided to communities through the issuance of grazing permits to six local ranchers. A stable supply of summer forage on National Forest land adds an element of economic viability to these ranch operations. Notably, the ranch land in private ownership provides essential big game winter habitat for deer and elk, which is in critically short supply.

Monitoring Questions

- *Are AMP's (Allotment Management Plans) being implemented on the ground?*

  AMP's contain several important components, which have been implemented as follows:
  1) Range improvements (fences) were constructed or maintained to gain better livestock control and ensure attainment of Forest Plan Standards and Guides related to riparian protection and allowable use of vegetation.
  2) Pertinent Forest Plan Standards and Guides have been incorporated into every livestock grazing permit. Permittee's are responsible for meeting the Terms and Conditions specified in these permits. 3) If a permittee does not comply with the Terms and Conditions, a "Notice of Non-Compliance (NONC)" may be issued.

  As stated in the 2002 Forest Plan Monitoring Report, two notices were issued for non-compliance with grazing permit Terms and Conditions. Actions requested by the Forest Service were performed by the permittees during the 2003 grazing season.

  Two additional NONC letters were issued to two different permittees for permit violations during the 2003 grazing season. Follow up and compliance will be monitored in the 2004 grazing season.

- *Are we meeting Forest Plan objectives for range?*

  In the 1990 Forest Plan, objectives for range were quantified and expressed as an output called "animal unit months" (p. four-14). The current Forest Service measurement of this output is called "head months". Actual livestock use was 3,684 Head Months (HM's) out of a total 3,684 HM's under permit.

Monitoring Range Ecosystem Function and Productivity

Long Term Vegetative Trends

An important aspect of ecosystem function and productivity is related to vegetation. Studies to monitor existing condition and long-term trend in vegetation are in place on all allotments using photo trend methodology. Plots are visited once every 5 to 7 years to record plant species diversity, percent bare soil, plant vigor and other factors, and record changes over time. These measurements, along with other observations made by a professional Range Conservationist, indicate that overall range vegetative condition is stable or improving.

Short Term – Forage Utilization Studies

Forage utilization Standards and Guidelines were developed to ensure that adequate vegetation is left after grazing. Plant health and vigor can be sustained if grazed properly. 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. Of the twenty-nine established monitoring sites, which are visited annually, twenty are located within riparian areas. Of those 20 sites, 85% (17) met Forest Plan Standards and Guidelines for forage utilization, while 15% (3 sites), did not. The remaining nine sites are located within the uplands, and 100% (9 sites) met Forest Plan Standards and Guidelines.

Recommendations

Monitoring indicates the majority of acres within grazing allotments are meeting or moving toward Forest Plan objectives. While this is a desirable situation, there are interactions and relationships to other resources that merit discussion.

As mentioned above, three of the monitoring sites located within riparian areas indicated forage utilization levels above those established in Forest Plan Standards and Guides. Permit administration and compliance is vital to ensure that instructions given to grazing permittees are carried out on the ground. Funding to accomplish this task is becoming scarcer. Solutions to this problem need to be identified.

As discussed in the Timber section of this monitoring report, numbers of acres harvested have dropped significantly over the past several years. This results in fewer acres of “transitory range” (as mentioned above) and therefore, less forage. This trend is expected to continue. On allotments where transitory range makes up a substantial portion of the available forage, there is a concern that livestock will rely more heavily on meadows and riparian vegetation. Some of these meadows and riparian areas are also heavily used by recreationists and provide important wildlife habitat. These trends and conflicts should be analyzed through the NEPA process as we proceed with updating allotment EA’s so that appropriate resource decisions can be made.

A productive, long-term partnership has been developed with Catlin-Gable High School. Students and staff work together on ecosystem restoration projects, generally with a fisheries focus, incorporating components of environmental education and monitoring. Many of these restoration projects have been done within grazing allotments, such as fencing riparian areas to control livestock use. The students (and Forest Service) learn a great deal, accomplish needed restoration work, and most importantly, give the students an understanding of the resource conservation issues they will be managing in the future. This important partnership should receive priority so that it will continue.

Noxious Weeds

Noxious weeds are monitored because they displace native vegetation, alter species composition of forest and rangeland, reduce the productivity of desired commodities, reduce species diversity and adversely affect recreational quality. Monitoring is conducted on weed control treatments, known infestations and new infestations. Monitoring weed control treatments gives us information used to determine the effectiveness of weed treatments and determine how best to allocate financial and personnel resources. Monitoring infestations gives us a concept of the impact of the weeds and makes it possible to target the most important sites to treat. As an example, treating a newly discovered, small infestation of aggressive non-native hawkweed now would prevent a large costly effort in the future.

Goal

Control noxious weed infestations and prevent 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,and the Mt. Hood National Forest Land and Resource Management Plan.

Existing Program

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

In 2003, efforts were focused on the control of hound's tongue (*Cynoglossum officinale*), knapweed species (*Centaurea* spp.), common toadflax (*Linaria vulgare*, and tansy ragwort (*Senecio jacobaea*) east of the Cascade Crest, and knapweed and non-native hawkweeds (*Hieracium aurantiacum* and *H. pratense*) west of the Crest.

Table 2-4. Acres of Noxious Weed Treatment

	Acres Treated by Method
Chemical	441
Manual	84
Mechanical	3
Biological	5
Fire	0
Total	**533**

Monitoring Questions

- *Are known untreated weed sites continuing to spread?*

  Yes. Of greatest concern is hawkweed. Satellite populations have been detected up to 10 miles from the one main population on Zigzag Ranger District. Giant knotweed (*Polygonum cuspidatum*) populations in the Sandy, Zigzag and Clackamas River drainages are also increasing.

  Both weeds form dense populations, displacing native plants. There is great concern that if either of the non-native hawkweeds becomes established in wet meadows, they would overwhelm those habitats. Wet meadows are relatively uncommon in the area and are biologically important. They are important foraging and calving habitat for elk. Forage is a significant limiting factor for elk on this forest. The hawkweeds are unpalatable to elk and therefore displacement of native forage species by the invasive non-native hawkweeds could have an adverse effect on the health of the elk population. Current hawkweed populations are mostly within a power line transmission corridor that is managed for low-growing vegetation to provide a safe distance between the wires and vegetation. This also provides habitat where the hawkweed thrives.

The giant knotweed forms aggressive dense stands 6 to 8 feet tall along streams, displacing native vegetation and degrading the habitat for riparian associated birds, mollusks, fish, insects and mammals. This weed has a weak root system and does not bind the soil well like native riparian vegetation, which leads to increased erosion during peak flows in the spring. There is also concern that it can change nutrient input to streams, further affecting aquatic organisms. The result may be degraded fish habitat in important anadromous fish bearing streams. Currently the known sites are at lower elevations along the Salmon River, Still Creek, Timber Lake Job Corps site in the Clackamas River drainage and Bear Creek. Currently, the only treatment method available is manual cutting, which has proven to be unsuccessful. Effective control methods using carefully applied herbicide are being developed, but until an Environmental Analysis is completed by the Forest, this option will not be available.

- *Are new infestations occurring?*

  Yes. New populations of knotweed and hawkweed have been detected during FY 2003.

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

  Some widespread weed species with established biological control agents such as Scotch broom (*Cytisus scoparius*), tansy ragwort at lower elevations, and St. John's-wort (*Hypericum perforatum*) are likely being controlled to some degree. Biological controls for the knapweeds have had minimal effect thus far. No biological controls have been approved for hound's-tongue, hawkweed, knotweed or toadflax.
  Biological controls do not eradicate weeds but do decrease their vitality and hold them to reduced densities. Part of the reason noxious weeds out compete natives is because the insects and diseases that affected them in their native habitat did not come here with them. The biological controls for the above weeds are all insects that do not significantly affect native plants.

- *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. Mitigations efforts are effective in preventing the introduction of noxious weeds into areas not yet infested. In 2003 greater emphasis was placed on mitigations than in previous years. Engineering has been cooperating in disposal of weed-contaminated material from roadside clearing. A greater emphasis has been placed on cleaning up active quarries to prevent the contamination of gravel used on roads. Mitigation measures are also in place for activities not considered ground disturbing such as back country horse use where weed free hay and straw is required.

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

  Yes.

Results

Chemical control methods were used to treat high priority hound's-tongue and tansy ragwort sites east of the Cascade Crest, knapweed sites on Barlow, Clackamas River and Zigzag Districts and hawkweed on Zigzag District. These treatments have been effective in reducing the number of plants, however, plants germinating from seed already deposited in the soil will necessitate treatment in future years until the seed bank is exhausted. The weeds are so widely established east of the Crest that eradication is not possible. Treatment has been effective in treating satellite populations preventing the establishment of new large entrenched infestations.

Surveys continue to locate satellite populations of hawkweed associated with the primary infestation along the Big Eddy-Ostrander transmission line from Lolo Pass west to the Forest boundary. These satellites have been small and can be manually controlled, however there is a possibility that some small infestations may be overlooked and grow to a size where eradication using manual control is no longer possible. In cooperation with the Bonneville Power Administration, increased efforts to control the primary hawkweed infestation took place in 2003. This should reduce the seed source and the number of satellite populations that result.

Rock sources and storage sites on Barlow District were targeted as a high priority for chemical treatment due to the possibility that contaminated material could be moved to other sites resulting in establishing a new weed infestation.

A small population of yellow starthistle on Hood River District is being controlled with hand pulling.

Giant knotweed sites associated with summer homes on Zigzag were handpulled. The experience of others and the literature suggests that this method will not result in controlling or eradicating knotweed, however, at this time it is the only method available to the Forest.

The population of knapweeds on treated roadsides is considerably reduced. The chemicals used have little effect on grasses, which are replacing knapweed along most of the treated areas.

Recommendations

- Continue to cooperate with Bonneville Power Administration to treat the primary hawkweed infestation within the Big Eddy-Ostrander power transmission corridor.

- Giant knotweed is a riparian weed species with the potential to alter habitat for fish and other species that depend on riparian habitats. Manual control has not been effective. Provide information to summer homeowners on how to limit the spread of knotweed and explore methods which may be used to control infestations.

- 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.

Some further background on selected major weeds:

The greatest total area affected by weeds is the drier eastside of the forest, where diffuse knapweed and other knapweeds are widespread along roadsides. Except in intensely managed areas and along major roadsides, it is beyond our ability to control these species on the eastside. On the west side, a concerted effort to eradicate every new knapweed site has been effective in keeping it at bay. Knapweeds have little forage value and displace native forbs and grasses. The result is extensive loss of forage for ungulates and cattle. It comes in where the soil is exposed whether by human activity, fire, large animals (elk, cattle etc.) or gophers. This is a continuing disturbance process, which is altering the species composition of the herbaceous plants, reducing productivity of forage for native animals and cattle. The result is

an ecological legacy from the permanent change in vegetation. Like cheat grass it is now an entrenched part of the ecosystem. It is spread by wind and animals over short distances and is readily caught under vehicles and carried long distances.

Hound's-tongue is also rather pervasive but over a smaller area (approx. 1,400 acres reported), on the south end of Barlow District. There are some small populations on Hood River. This weed, which is toxic when eaten and unpalatable, displaces forage plants for cattle, elk and deer. The seeds are covered with tiny hooked barbs that cling to clothing and fur. The faces and sides of the cattle are sometimes nearly gray with seed. It varies in density from near 100% cover in very disturbed open areas to scattered under brush and tree canopy. It has continued to move into recently logged stands. Over time it does seem to shade out in dense plantations as the canopy closes. The area is heavily used by off road vehicle enthusiasts and associated camping. The seeds cling to clothing so it is likely being transported to other recreation sites and the homes of the forest users. Seeds are certainly carried to other sites, by forest workers such as painting crews, survey crews, logging workers and recreationists. The total population is too large and spread out to eradicate. Control efforts with herbicides are concentrated on satellite populations, roadsides and heavily used areas such as McCubbins campground. Prior control efforts using mechanical and handpulling work proved ineffective.

Tansy ragwort is common on the west side of the Cascade Crest where the only control is biological. At higher elevations the moth and beetles have not adapted to the climate and are not very effective. On the east side populations are smaller and treatment is more effective. We actively treat tansy by hand pulling and herbicide treatment. Tansy is phytotoxic and unpalatable. It competes well when other factors such as grazing or severe frost limit the native vegetation.

Scot's broom is mostly a westside problem where it has invaded large areas after logging and it is a robust competitor in young forest plantations. The result is fewer surviving trees that take longer to grow over this shrub. It dies out when overtopped by the trees but will persist in openings, along roadsides and particularly in power line clearings. Economically the effects are serious. The dense stands also overwhelm the native understory vegetation. Generally it is not treated on the west side because it is beyond our abilities to handle mechanically and herbicides while effective are not a viable option. On the east side it is an occasional weed, probably because it is less vigorous in the drier climate. All east side sites are treated so it has been kept to low levels.

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, four monitoring elements were identified in the Forest Plan.

1. Tribal Consultation

The Confederated Tribes of the Warm Springs (CTWS) are consulted in all projects located on tribal lands and usual and accustomed areas. The Barlow District Ranger is the Tribal contact for the Forest and meets on a regular basis with the CTWS to discuss a variety of resource issues. In addition to the formal NEPA scooping, the Forest has developed and maintains informal contacts with the CTWS. The implementation of a memorandum of understanding between the Forest and CTWS, signed in July 1997, regarding the management of huckleberry habitat on the Forest continues to be very successful.

The Confederated Tribes of the Warm Springs (CTWS) were contacted at least once for every project. Follow-up consultation is ongoing, primarily in regard to fisheries. Additional non-project contacts include management of the Bear Springs Compound, ANPO, as well as watershed restoration project planning.

Specific meetings with the CTWS included consultation regarding water system development at the Bear Springs recreation area. A contract to perform archaeological reconnaissance for the project was awarded to the CTWS cultural resources department. The contract was completed in fiscal year 2003.

2. Historic Preservation Standards

Significant (National Register eligible) historic buildings and structures are maintained, stabilized, and repaired according to historic preservation standards, in consultation with the State Historic Preservation Officer (SHPO).

Timberline Lodge (National Historic Landmark)

A Historic Building Preservation Plan (HBPP) was completed for Timberline Lodge in 1998. This plan provides managers credible alternatives for routine maintenance, rehabilitation and replacement of historic fabric throughout the building. Table 2-5 lists projects approved during fiscal year 2003 following consultation with the State Historic Preservation Officer (SHPO).

Table 2-5: Approved Projects at Timberline Lodge

Project	Date to SHPO	Finding
Headhouse flagstone steps	10/04/02	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Guestroom light fixtures	10/28/02	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Cleaning "Huckleberry Pickers" painting by C.S. Price	11/05/02	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Repair/Replacement of Animal Head Cavings	12/18/02	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Headhouse Corridor Arch	01/22/03	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Window well repair	01/28/03	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Stairwell wall fixtures	01/28/03	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Guestroom accessibility	04/21/03	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Guestroom and dormitory bathroom rehabilitaton	04/21/03	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Headhouse pedestrian lift	04/23/03	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Storage room, Price Wing	04/23/03	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Automatic door openers	04/29/03	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Exhibit update	06/02/03	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
North window replacement	06/12/03	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.
Windows Management Plan	07/05/03	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.

Cloud Cap – Tilly Jane National Historic District

A management plan for the historic district, located on the north slopes of Mount Hood, is currently under development. Completion of the plan is expected by November 2004. Historic preservation efforts during 2003 focused on Cloud Cap Inn, built in 1889 and listed on the National Register of Historic Places. Phase V rehabilitation work at Cloud Cap Inn was implemented under terms of an existing Memorandum of Understanding with the Crag Rats regarding operations, maintenance, and preservation activities. A "No Adverse Effect" determination was made for the proposed 2003 work, which included floor and ceiling repairs, wall log and fireplace repairs, and window replacements.

A cultural resource management plan for the Tilly Jane Cook Shed was prepared in fiscal year 2003. A draft management plan for the Tilly Jane A Frame was also prepared and submitted to the State Historic Preservation Officer for review.

Silcox Hut

Located in the Timberline Ski Area, Silcox Hut was built in 1939 to serve as the upper terminus of the original chairlift. Silcox Hut is listed on the Naional Register of Historic Places. A "No Adverse Effect" determination was made for planned repairs to the stone floor.

Sahalie Falls Bridge

Associated with the historic Mount Hood Loop Road, the Sahalie Falls Bridge is a National Register eligible structure built 1924-28. Erosion has undermined bridge supports, requiring emergency repairs. A "No Adverse Effect" determination was made for temporary stabilization measures implemented in 2003.

Bull Run Lake Cabins

Three historic log cabins owned by the City of Portland are located on National Forest land at Bull Run Lake. The cabins date from the period 1915-1923 and were determined eligible to the National Register of Historic Places. A "No Adverse Effect" determination was made for proposed cabin restoration, with conditions regarding work specifications.

Phlox Point Cabin

Owned by the Boy Scouts of America, Phlox Point Cabin is located on National Forest land near the Timberline Ski Area. Built in 1926, the cabin has been determined eligible to the National Register of Historic Places. A "No Adverse Effect" determination was made for proposed remodeling of the cabin.

Devil's Peak Lookout

Built in 1933, the fire lookout on Devil's Peak is the oldest surviving fire lookout on the Mt. Hood National Forest. The lookout was determined eligible to the Ntional Register of Historic Places. A "No Adverse Effect" determination was made for proposed repairs to the lookout deck, railing, and stairs.

3. Nominations to the National Register of Historic Places

The last National Register nomination was for Bagby Guard Station in September 1999. A nomination package for the historic Cooper Spur Warming Hut was completed in 1994, but not submitted. In consultation with the State Historic Preservation Office, the Forest evaluated five historic properties in fiscal year 2003, including the Bull Run Lake cabins, Devil's Peak Lookout, and the Phlox Point Cabin . All were determined eligible for inclusion in the National Register of Historic Places. Four other sites were determined ineligible.

4. Interpretation and Public Involvement

Three methods are typically used to facilitate public involvement with the Heritage Resource Program: interpretation, education, and volunteerism. The successful interpretive program at Timberline Lodge reaches thousands of visitors every year. Frequent tours are conducted at the Lodge, and Friends of Timberline oversees changing exhibits and demonstrations relating to the history of the Lodge and recreation on Mount Hood.

Public archaeology and restoration activities have been particularly successful ways to involve volunteers in the management and interpretation of heritage resources. A total of 56 volunteers participated in eight projects, contributing 578 volunteer hours. Projects included: Oregon Archaeological Society Memorial Day weekend archaeology project in Wasco County; a *Passport in Time* group volunteer project to document emigrant inscriptions along the historic Barlow Road; work on the Pioneer Woman's Grave; work on the Tilly Jane Guard Station and A-Frame; and volunteer office support. Media coverage of the Barlow Road project was an effective form of public education and interpretation.

In September, the Barlow Ranger District hosted an on-site interpretive program on emigrant use of the Barlow Road at White River Station Campground. The program was held in conjunction with Oregon Archaeology Month.

Volunteers from the Oregon Archaeological Society (OAS) continued participation in the Site Stewardship Program, designed to ensure that particularly vulnerable prehistoric sites receive periodic monitoring and condition assessment. The program operates under the terms of a Memorandum of Understanding between the OAS, Mt. Hood National Forest, Gifford Pinchot National Forest, and Columbia River Gorge National Scenic Area.

Conclusions

Avoidance of impacts to heritage resources has been a goal for all projects implemented during fiscal year 2003. Heritage Program staff routinely monitor the condition of heritage resources during and after project activities to ensure that avoidance procedures and protective measures were effective. No adverse effects were reported.

Recommendations

Heritage Program activities focused on the highest priority projects and resource protection efforts. A number of specific projects were still in progress at the end of the year, and remain to be completed. The following projects are recommended for addition to the program of work for fiscal year 2004, depending on staff availability and workload priorities:

- Complete the consultation process for the Peeled Cedar Management Plan and execute a Memorandum of Agreement for this class of historic resources.
- Complete the management plan for Cloud Cap – Tilly Jane Historic District.
- Complete the reanalysis of the Forest-wide heritage resource inventory design.
- Evaluate remaining historic buildings on the Forest for eligibility to the National Register of Historic Places.
- Develop a site determination of eligibility schedule to reduce the backlog of unevaluated sites.
- Expand Site Stewardship Program through partnership with Oregon Archaeological Society including a larger number of sites in the monitoring program.
- Complete evaluations of historic recreation residence (summerhome) tracts on the Forest.

Geology

Goal

The goal for the geology program is to sustain the productivity of areas susceptible to landslides. Long-term stability of the area is the overall objective.

Earthflow

There were no timber harvest units in FY03 on land mapped as high or moderate risk earthflow. No roads were constructed on B8 (earthflow) land. There were no timber harvest units on mapped landslides in FY03. No roads were constructed on mapped landslides. This is the first year since monitoring began there were no management activities of any kind on B8 (earthflow) land. This clearly meets the Forest Plan standards and guidelines for B8 land.

A major earthflow-boundary remapping effort was completed for the Collawash watershed during a watershed analysis study for that watershed in FY03. Earthflow boundaries were confirmed or modified based on a combination of field mapping and aerial photo mapping. The result was a more accurate spatial depiction of earthflows in that watershed than what existed previously.

No acceleration or initiation of earthflow movement has been measured or suspected as a result of timber harvest or road building activities on B8 land since monitoring began in FY91.

Continued measurements during FY04 at established earthflow monitoring stations will provide valuable information to guide future management activities on earthflows. These measurements are primarily for slope movement rates. Measurements have been made annually since 1993 and are showing movement rates ranging from zero to several feet per year. Much additional effort is still needed in verifying the scientific validity of the standards and guidelines for earthflows, particularly those covering hydrologic recovery.

Additional efforts in 2004 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.

Landslides

There were three moderate-sized debris flows on Mt. Hood during FY03, occurring during a period of record heat in the late summer. Debris flow frequency has increased on Mt. Hood since a regional climate change that occurred in 1995. Large debris flows are one of the geologic hazards associated with large active volcanoes. Large debris flows in the stream channels that drain Mt. Hood are likely to continue, threatening public safety and transportation routes. Interagency efforts are underway to redesign steam crossings or relocate roads to minimize the damage from these natural events.

Minerals

Goal

The goal of the minerals program is to provide a sustainable flow of mineral resources while maintaining compatibility with other resources potentially impacted.

There were no commercial leasable or locatable mineral development activities on the Mt. Hood National Forest in FY03. Locatable mineral activities were limited to minor sampling and exploration on the Forest. Three Notice-of-Intents were submitted to the Forest. In all cases the planned activity was limited to mineral exploration. There were 23 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 13 projects where a total of 9,400 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 FY03 there were 13 operating plans completed for current and future projects. Two small quarries were closed and restored.

There were 487 smaller projects where salable mineral materials were used by the public. These projects removed a total of 435 cubic yards. Prices for the various rock products available for sale to the public were adjusted in FY02 following the completion of an appraisal process that examined the prices charged at local commercial rock product businesses.

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.

The Mt. Hood National Forest continues to be able to supply high quality rock products to the general public, other government agencies, and for our own use. Rock is a non-renewable resource, however, this forest has large quantities of high quality rock and with proper resource management, should be able to satisfy demand for many years. 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.

Soils

Goal

- Determine amount of post harvest detrimental soil impacts as they relate to the forest plan.
- Examine a five acre portion of Chee unit 18 that was logged in a slightly different way than the remainder of the unit to determine if forest plan standards could still be met.

On June 12th, 2003, a portion of unit 18 on the Chee Timber Sale was monitored to determine post harvest cumulative impacts to soil quality. Table 2-6 summarizes the results:

Table 2-6. Summary of Unit Monitored with Shovel Probe Transects

Sale Name	Chee
Unit No.	18
Acres	5
Silv Treatment	Thin
Logging System	Feller Buncher, Rubber tired skidder
Fuel Treatment	None
Previous Entries	Unknown – likely 0 or 1
% Soil Impacts	12.7

The unit examined showed detrimental damage. Based on shovel probe transects, the amount of impact is currently estimated at 12.7% (27 of 212 sample points), which is under the 15% threshhold in the Forest Plan. Summarized below are some key points and observations regarding this portion of unit 18:

- The portion monitored was five acres. Past monitoring experience has shown that units five acres and smaller tend to exceed the forest plan standard of 15% because landings and main skid trails are so concentrated in a small area. It is a positive outcome that this portion of the unit came in under the standard given its small size, and the percentage would likely be smaller if implemented over an entire timber sale unit.
- Soils in the area monitored were not as rocky (and therefore slightly more compactable) as the overall planning area, further emphasizing this is a positive outcome.
- The five acre area was logged with a feller buncher that carried whole trees to the nearest skid trail (thus reducing the slash in the unit itself), where the rubber tired skidder with a grapple would then move them to the landings.
- The area should be reviewed to see if brush disposal is even needed.

Fisheries Program

Goal

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

Setting

The Mt. Hood National Forest is home to several populations of salmon, steelhead, and resident trout. There are over 1,600 miles of fish-bearing streams on the Forest with approximately 300 miles supporting anadromous (i.e., ocean-going) populations of salmon and steelhead. The primary river basins on the Forest include:

- Clackamas River Basin
- Fifteenmile Creek Basin
- Hood River Basin
- Sandy River Basin
- White River Basin (Deschutes River system)

The federal lands, predominately Forest Service, comprising these river basins make up the vast majority of land ownership. Federal lands, on average, comprise from two-thirds to three-quarters of the total land ownership in these river basins, thereby emphasizing the critical importance of the aquatic habitat conditions on the Mt. Hood National Forest.

Forest Plan Monitoring Goal: To determine if Forest Plan standards and guidelines are effective in maintaining or enhancing aquatic habitat complexity and fish habitat capability.

Given the predominance of federal lands in the primary river basins identified above, the role of federal lands is critical in providing "anchor" habitats for rebuilding fish populations to sustainable levels. "Anchor" habitats are considered as those streams or rivers that provide relatively good to excellent aquatic habitat conditions in large watersheds (20-50 mi^2). These areas have the added protective measures afforded to them by statutory federal requirements (e.g., Wild & Scenic Rivers Act, Wilderness Area protection, Roadless Area designation, Northwest Forest Plan Aquatic Conservation Strategy, etc.). While the status of fish populations in each of the primary river basins is of particular concern given the number of Endangered Species Act listings across the Forest (see Table 2-7, below), the maintenance and enhancement of aquatic habitat on federal lands is crucial for their recovery and long term sustainability. As habitat managers, Forest Service personnel continue to protect and restore valuable stream habitats and riparian areas.

Table 2-7. Fish Populations of Concern on the Mt. Hood National Forest.

Species	Evolutionary Significant Unit	Status	Watershed
Steelhead (*Oncorhynchus mykiss)*	Lower Columbia River	Threatened 3/98	Sandy River, Clackamas River, Hood River
Steelhead (*Oncorhynchus mykiss)*	Middle Columbia River	Threatened 3/99	Fifteenmile Creek, Mill Creek
Chinook *(Oncorhynchus tshawytscha)*	Lower Columbia River	Threatened 3/99	Sandy River, Hood River
Chinook *(Oncorhynchus tshawytscha)*	Upper Willamette River	Threatened 3/99	Clackamas River
Coho *(Oncorhynchus kisutch)*	Lower Columbia River/Southwest WA	Candidate 7/95	Clackamas River, Sandy River
Bull Trout *(Salvelinus confluentus*)	Columbia River District Population Segment	Threatened 5/98	Hood River
Redband trout (*Oncorhynchus mykiss gairdneri*)	N/A	Sensitive	Miles Creeks, Hood River, White River
Cutthroat Trout (*Oncorhynchus clarki*)	N/A	N/A	Clackamas, Sandy, Hood River, Miles Creeks
Rainbow Trout (*Oncorhynchus mykiss irideus*)	N/A	N/A	Clackamas River, Sandy River, Hood River, Miles Creeks

Anadromous fish have a complex life history, which includes freshwater, migration and saltwater phases. Salmon, steelhead, and bull trout production continue to be monitored in the Clackamas, Fifteenmile, Hood River, and Sandy River basins. Forest Service personnel in collaboration with other federal, state, and non-governmental partners monitor fish production differently in each basin. In some basins, redd surveys are conducted annually on index reaches, while in other basins snorkel counts are used. Monitoring of smolt production occurs to the largest extent in the Clackamas River Basin, followed by the Sandy River Basin to a lesser extent.

In addition to fish population trend monitoring, stream habitat restoration projects are also monitored to evaluate their effectiveness for enhancing habitat conditions. District personnel monitor various habitat restoration projects each year. Monitoring of habitat restoration projects may be as simple as photo points, or as complicated as using biofilm collecting tiles in streams to calculate stream productivity.

Fish Population Trend Monitoring

A) Winter Steelhead and Pacific Lamprey Spawning Surveys (Barlow and Hood River Ranger Districts)

In 2003 an important step was taken in the collaborative management of fisheries on the Forest when the Mt. Hood National Forest joined forces with the Oregon Department of Fish and Wildlife (ODFW) to survey the entire Fifteenmile Creek Basin. Although both agencies collaborated in the past and were partners in the survey effort, there was never a coordinated survey designed to assess the entire basin.

In 2003 ODFW published a survey method with spawning protocol for use statewide. Fisheries biologists from both agencies selected survey reaches from the 100 mile of potential steelhead spawning habitat in the Fifteenmile basin. Protocol is described in an accomplishment report available at the Barlow Ranger District.

In addition, five index reaches repeatedly surveyed in the past were included. The index reaches contain high quality habitat and provide a link to earlier data.

In 2003, Forest personnel surveyed a total of 25 reach segments. All, with a few exceptions, were surveyed three times during peak steelhead spawning in April and May. Of the twenty, eleven were on lower elevation, private lands.

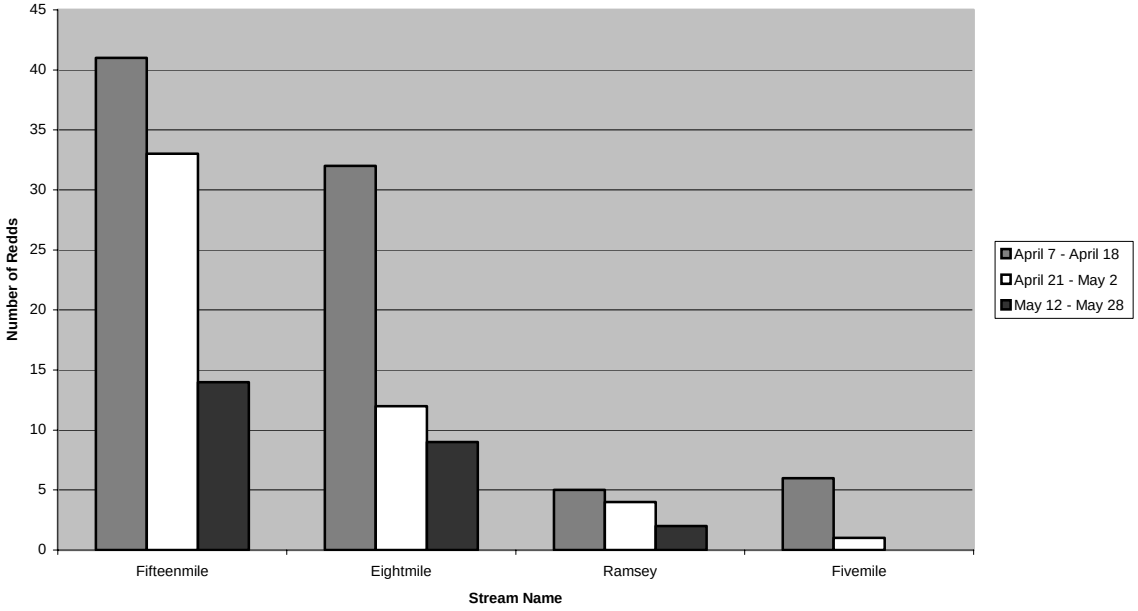
Results and Discussion

A total of 159 steelhead redds were counted across the Fifteenmile Creek Basin. Over half were in Fifteenmile Creek. Highest density of redds was also in Fifteenile Creek at 7.7 redds per mile. The estimated total number of steelhead redds throughout the Fifteenmile basin was 525.

One third of redds were found on private lands, indicating a relatively large portion of steelhead are spawning in the lower portion of the basin. Egg to smolt survival may be reduced for these steelhead, compared to the upper basin, because of widespread habitat degradation, particularly elevated water temperatures in the summer.

This is the first year repeat surveys were conducted throughout the entire basin. Compared to previous years surveys, multiple surveys provide a more accurate count of total number of redds (see Figure 2-1) throughout the spawning season.

Figure 2-1. Number of Steelhead Redds by Stream by Survey Date



Since ODFW's protocol was adopted in 2003 comparisons to previous years are not possible. It is worth noting that in past years more redds were found in Fifteenmile and Eightmile Creeks compared to the other two tributaries. There were only six redds found in Ramsey Creek compared to 28 in 2002. Biologists are uncertain why there was such a large drop in 2003.

Pacific Lamprey

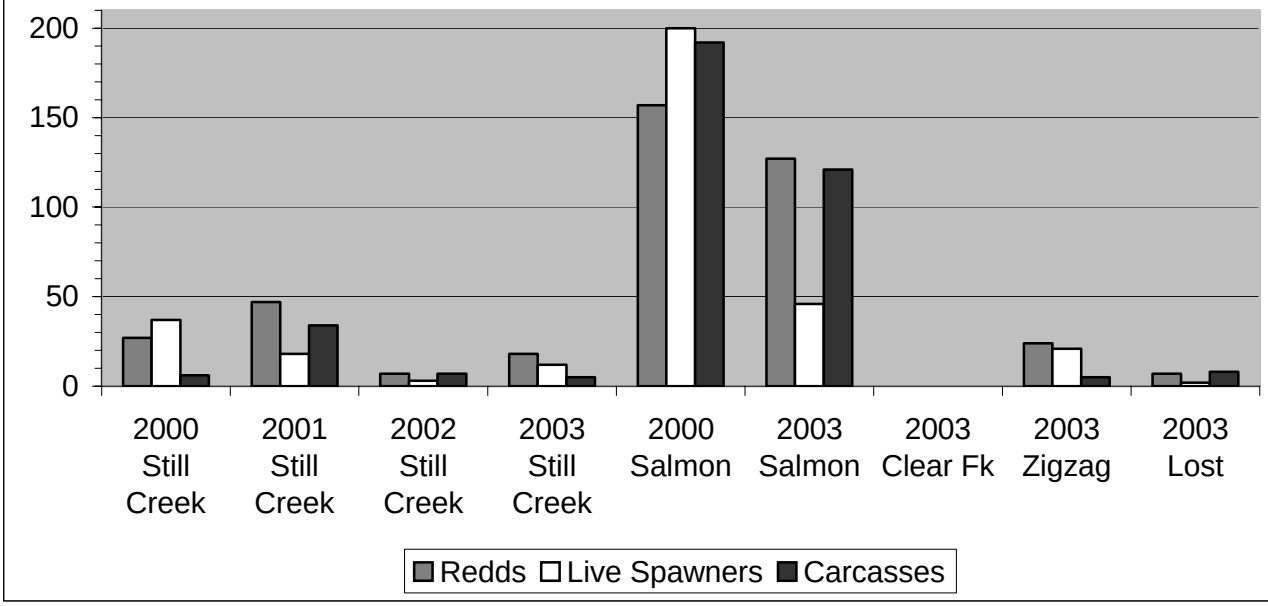
Pacific Lamprey are native to the Fifteenmile Creek basin. Information on their status was collected anecdotally while collecting steelhead spawning information. Forty-one lamprey redds were counted in Fifteenmile Creek, and ten redds in Eightmile Creek. No lamprey redds were counted in Ramsey or Fivemile Creeks. Most redds were counted during the third and final survey. Lamprey spawning appears to occur after the peak of steelhead spawning. There were a number of cases where lamprey built redds on top of existing steelhead redds.

B) Chinook Spawning Surveys (Zigzag Ranger District)

From September to October in 2003, the Zigzag Ranger District conducted spawning surveys for spring chinook in the Upper Sandy River Basin. Fisheries biologists from Zigzag Ranger District also adopted the new ODFW protocol. Spawning survey streams were determined cooperatively between ODFW and Zigzag personnel. By coordinating survey efforts, more accurate and efficient surveys will result. As a result of the joint effort, the Zigzag was also able to conduct additional surveys on the Zigzag, Lost, and Clear Fork Streams. Still, Lost, Zigzag, and Clear Fork Creeks counts are from index reaches, and the Salmon River count is taken from a 14-mile section from the mouth to Final Falls

Results of chinook spawning surveys in tributaries of the upper Sandy River between 2000 and 2003 are shown in Figure Figure 2-2.

Figure 2-2. Chinook Spawning Surveys on the Upper Sandy River



C) Bull Trout Spawning Surveys (Hood River Ranger District)

Redd surveys are repeated annually in low gradient, non-glacial streams to establish spawning index rates. In 2003, 15 bull trout redds were found in Clear Branch, all above Laurance Lake. Four bull trout redds were found in the lower 1.25 miles of Pinnacle Creek.

D) Bull Trout Adult and Juvenile Counts (Hood River Ranger District)

Snorkeling is the primary survey technique to monitor population trends. Snorkeling at night is the most successful for consistent juvenile census. Night snorkeling is used for all exploratory surveys to find new populations within the Hood River Basin.

The results of the annual counts are displayed in Figure 2-3. Since 1996 only three adults and 8 juveniles have been found below the Clear Branch Dam at Laurance Lake.

In 2003, 26 adults and 135 juveniles were found in streams above Laurance Lake. Approximately 25% of available habitat was surveyed. Bull trout populations on the Forest above Clear Branch Dam continue to be at very low levels.

E) Bull Run Lake Cutthroat Trout Monitoring (Zigzag Ranger District)

In 2003, the Zigzag Ranger District continued annual monitoring of cutthroat trout spawning in the tributaries of Bull Run Lake, as required under the Bull Run Lake Mitigation and Monitoring Plan. The lake, used as a source of drinking water by the Portland Water Bureau, has a unique, naturally producing wild population of coastal cutthroat trout. Since cutthroat trout are the only fish in the lake, this population is pure and is not subject to hybridization with other fish.

The drought during the winter of 2000-01 resulted in the lowest lake levels since 1993. Spawners had difficulty accessing spawning streams. As a result, tributary redd counts in 2001 were the lowest since monitoring began in 1998. In 2002, redd counts remained low even though lake elevations were high enough for spawners to access the tributaries (see Figure 2-4). Redd counts for 2003 totalled 78 redds, up from the two previous low counts of 2002 and 2001. The jump in counts reflects earlier totals seen in 1998 and 1999. Recent data suggests that higher redd counts may be related to better flow conditions in the tributaries during the brood year egg incubation. Better tributary conditions during egg incubation will result in higher fry production and thus higher numbers of fry reaching adult spawning maturity 4 years later.

Figure 2-3. Summary of Annual Bull Trout High Counts, Clear Branch Hood River 1996-2003

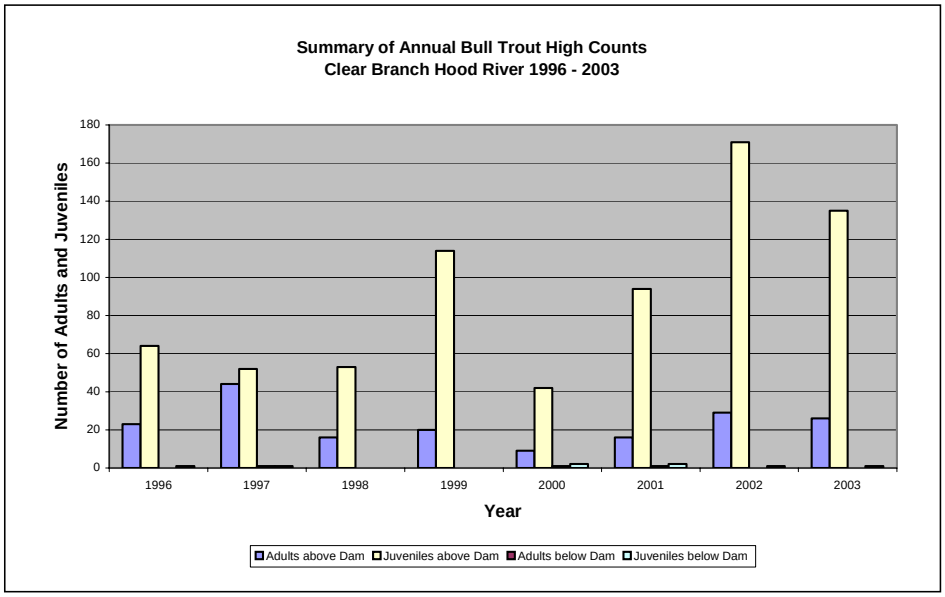
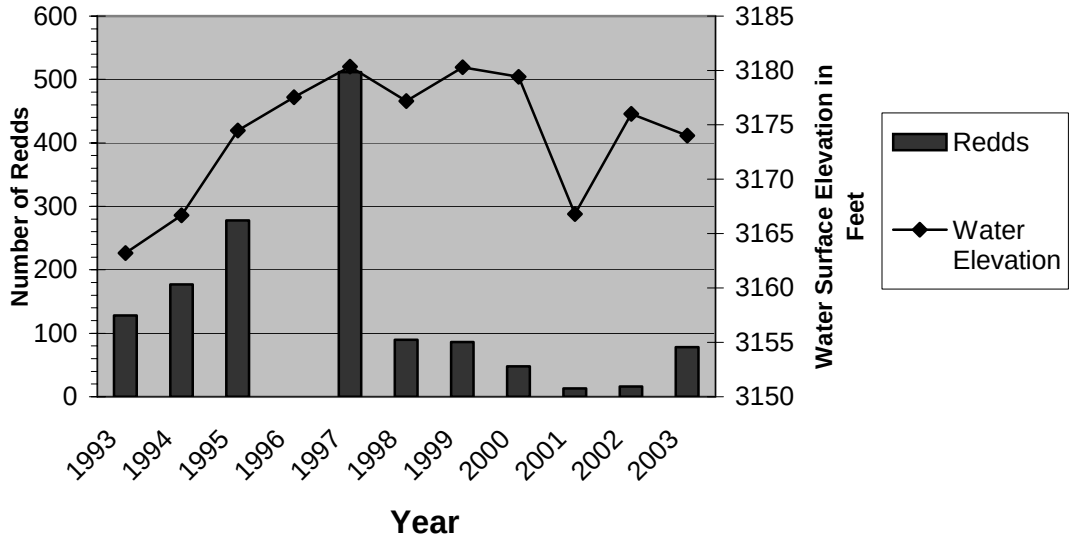


Figure 2-4. Bull Run Cutthroat Trout Redd Monitoring



Monitoring of these fish in Bull Run lake will continue as part of the Mitigation and Monitoring Plan developed with the US Forest Service and the City of Portland Water Bureau to ensure continued viability of this isolated population of coastal cutthroat trout.

F) Clackamas River Smolt Production Monitoring (Clackamas River Ranger District)

Since 1993, a consortium of fish biologists from federal, state and private organizations has partnered together to address fish management issues on the Clackamas River. In 2003, the Clackamas River Ranger District continued its role as a principal partner.

Biologists led efforts to monitor out-migrating smolt populations through a system of seven rotary smolt traps at locations throughout the Clackamas River Basin. Four are on-Forest and three are operated off-Forest. All fish caught are enumerated, and population estimates are completed for coho salmon and steelhead. Figure 2-5 displays the results of trapping from 1994 through 2003.

In 1998 and 2000, traps were added at locations below the network of dams near Estacada. As indicated on Figures 2-5 and 2-6, most major tributaries of the Clackamas River are monitored for smolt production. Big Bottom, on the upper Clackamas River, continues to be an important location for coho rearing and production. Distribution of steelhead production appears to be more widespread throughout the basin. Coho are listed as a State of Oregon sensitive species, and their overall numbers are lower, and in some instances extremely low in some tributaries.

Figure 2-5. Estimated Coho Smolt Production from Watersheds of the Clackamas River 1994-2003

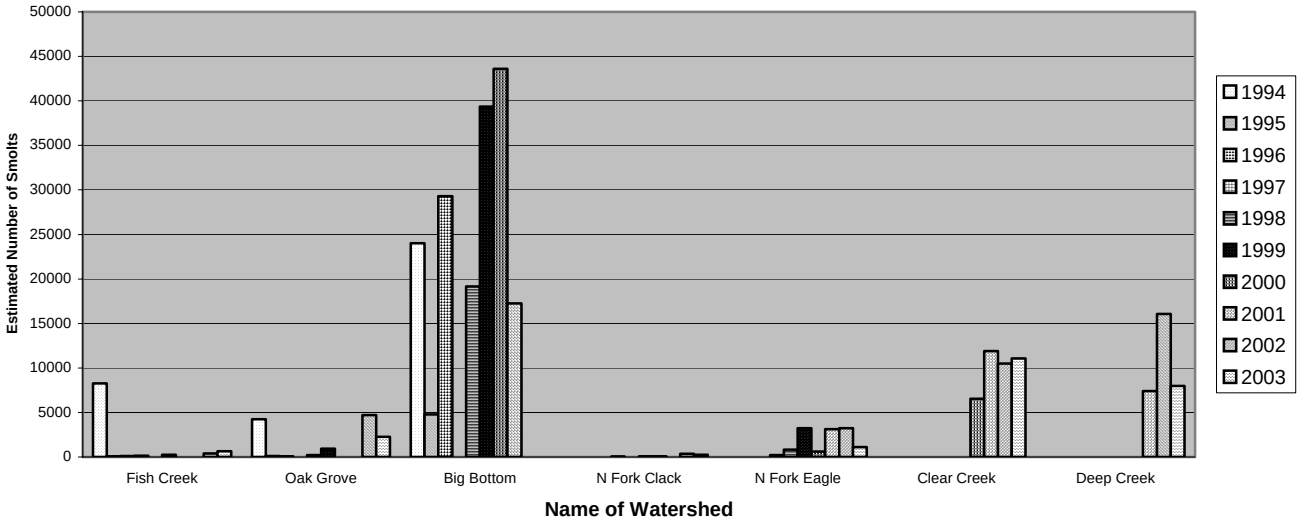
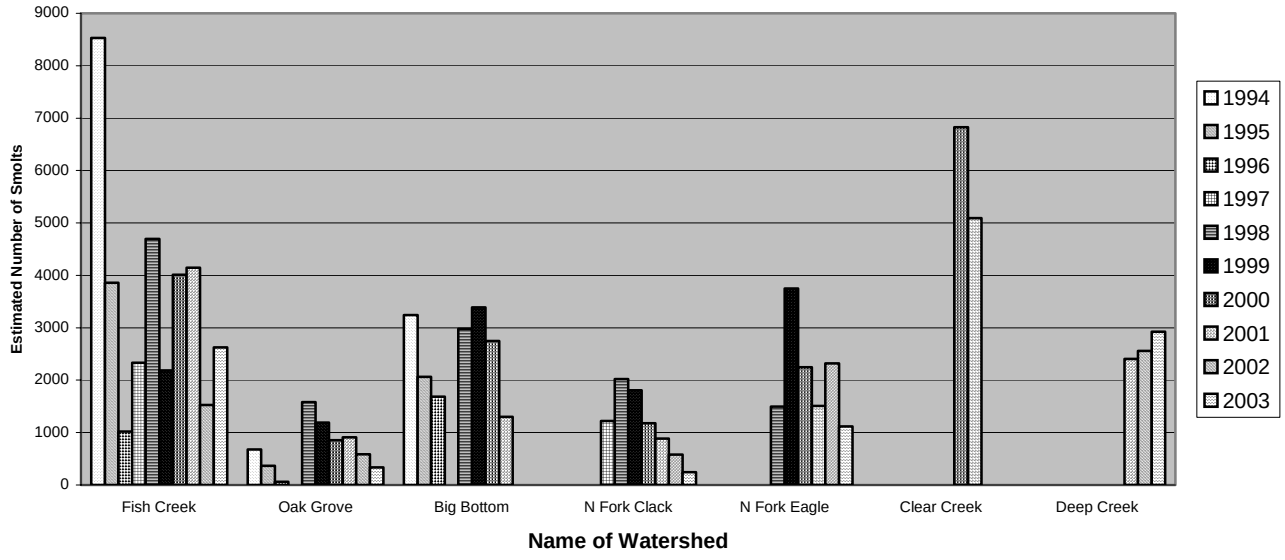


Figure 2-6. Estimated Steelhead Smolt Production from Watersheds of the Clackamas River 1994-2003



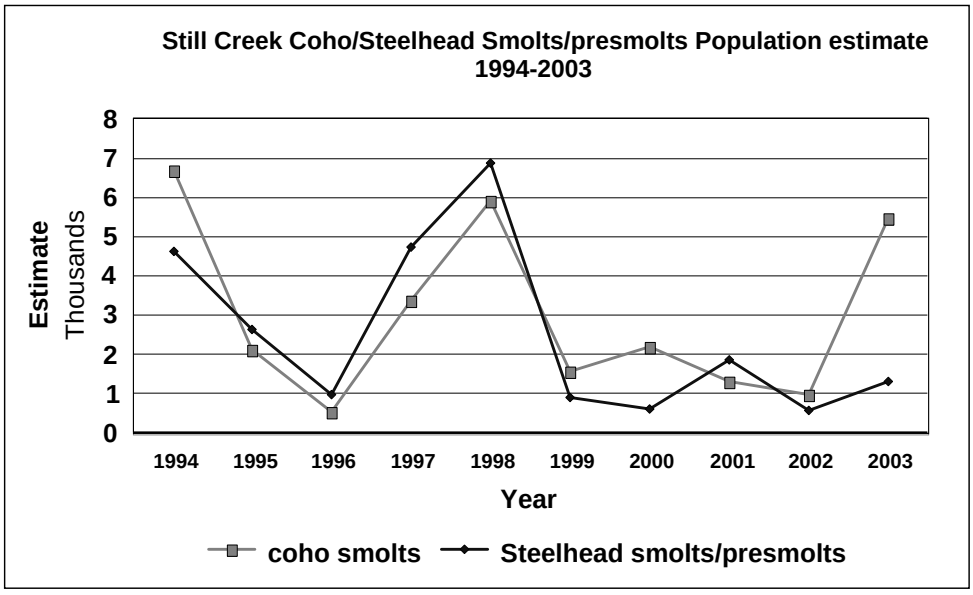
G) Upper Sandy River Smolt Production Monitoring (Zigzag Ranger District)

In 2003, the Zigzag Ranger District continued monitoring of smolt production in the Upper Sandy River Basin. A new trap site at Clear Fork was initiated in 2003. Smolt trapping provides increased accuracy for monitoring recovery of upper Sandy River Basin stocks of threatened steelhead trout and coho salmon. Data will be incorporated into the Ecosystem Diagnostic Treatment (EDT) Method for modeling productivity in the Sandy River Basin along with ongoing salmon carcass enrichment projects at Clear Fork and Still Creek.

In 2003, a population estimate of 5473 coho and 1315 steelhead fish (juveniles and smolts combined) for Still Creek was attained. At Clear Fork, the population estimates were 1327 coho and 1002 steelhead. Figure 2-7 shows population estimates for Still Creek over the years.

Environmental education is also a key component of the Zigzag Ranger District smolt traps. Beginning in 2001, students from Portland-area high schools and colleges were given the opportunity to help staff the traps as a part of their school curriculum.

Figure 2-7. Still Creek Coho/Steelhead Smolts/Presmolts Population Estimate



H) Laurance Lake Littoral Zone Survey (Hood River Ranger District)

Invasive, non-native species are a growing concern on the Forest. Smallmouth bass, an introduced fish, are known to occupy Laurance Lake, but numbers and distribution are unknown. In 2003 biologists at Hood River Ranger District made the first attempt to determine the assemblage of fish in the shallow areas near the shore of Laurance Lake (the littoral zone). Results are shown below in Table 2-8 and Figure 2-8. Biologists are discussing next steps to further determine impacts of these invasive fish.

Table 2-8. Relative Abundance of Fish Species Counted During a Day Snorkel Survey of the Entire Lake Margin of Laurance Lake in the Littoral Zone, July 29, 2003.

Fish Species	Number of Fish Counted
Smallmouth	38
Trout	111
Bull Trout	17
Unknown	5

Conclusions & Recommendations

Monitoring information is used to better understand life history stages of different fish populations, and focus recovery efforts for listed ESA fish. The overall abundance of anadromous fish and bull trout continues to be low in those streams and rivers monitored on the Mt. Hood National Forest. For example, bull trout monitoring in the Hood River system has shown the distribution of bull trout has expanded significantly over the past decade, yet abundance is still quite low.

The actual utilization of habitat by various fish species is far below the overall productive capacity of rivers and streams on the Mt. Hood National Forest. Therefore, Forest Service fish biologists continue to work in partnership with partners dedicated to fish conservation and restoration, and watershed councils across the Forest to assist in all fish recovery aspects at the whole-river basin level. In fiscal year 2003, Forest Service fish biologists:

- Integrated spawning surveys with the Oregon Department of Fish and Wildlife's protocol in the Fifteenmile River Basin and the Sandy River Basin.

- Served as a major partner in the Hood River Subbasin Planning Effort where a full river basin assessment is underway through the Ecosystem Diagnosis and Treatment (EDT) modeling procedure.

- Contributed to the full-basin assessment of the Sandy River Basin by completing the EDT modeling effort in partnership with all other Sandy River Basin Agreement (SRBA) participants. This effort also included the identification of restoration project opportunities throughout the basin on federal, state, and private lands.

- Participated in the Clackamas River Basin Fisheries Working Group to monitor fish populations all throughout the Clackamas River Basin and identify actions for recovery of fish populations.

- Contributed staff and materials to complete a high priority, off-Forest stream habitat restoration project in the Clackamas River Basin and the Sandy River Basin in partnership with the Clackamas River Basin Watershed Council and the Sandy River Basin Watershed Council.

Smolt production monitoring is a component of determining effectiveness of the fish carcass nutrient restoration project in the Sandy and Clackamas River Basin. Several of the watersheds with long term smolt trapping data sets are being used as baseline data sets, and more recently added smolt trapping watersheds are treatment watersheds. 2003 was the second year of the carcass nutrient project and data are still preliminary.

All of these efforts highlight the role, both on-Forest and off-Forest, that the Forest Service plays in helping to recover and maintain sustainable fish populations in the major river basins on the Mt. Hood National Forest. Monitoring of fish populations and restoration project effectiveness is often one of the first work items dropped when congressionally appropriated budgets are reduced. Fisheries Program managers at the Forest Headquarters and ranger districts continue to recognize the importance of the monitoring program and will continue to support and implement monitoring items in an efficient manner to the best of their abilities.

Water Resources

Goal

A key goal of the Mt. Hood and Northwest Forest Plans 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.

Water quality Best Management Practices (BMPs) and related Forest and Northwest 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 non-point source pollution control.

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 Understanding with the Oregon Department of Environmental Quality (DEQ). Some of the monitoring activities are designed to monitor the effectiveness of watershed restoration work, such as road decommissioning.

Existing Situation

The Northwest Forest Plan (1994) prescribed various standards and guidelines for resource management activities, many of which are more stringent than those prescribed in the Mt. Hood National Forest Plan. A good example is the Northwest Forest Plan standard for riparian reserve widths, which are typically one or two site potential tree heights. Riparian reserve widths of one or two site potential tree heights are more than adequate for protecting practically all stream shading. As a result, water temperature monitoring for the effectiveness of riparian reserves to protect stream temperature at the project level is no longer needed. Monitoring funds for water temperature are now being used for water temperature trend monitoring at 72 sites across the forest, to gather data on existing water temperature conditions, water temperature recovery in certain watersheds, and compliance with State water quality standards for temperature.

Implementation Monitoring

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.

Best Management Practices (BMPs)

BMPs are those practices used to achieve compliance with State water quality standards and protect the beneficial uses of water. Two kinds of BMP monitoring typically occur, implementation and effectiveness. The former is the determination of whether or not specified BMPs were implemented as prescribed, and the latter determines whether the prescribed BMP was effective at preventing or minimizing the undesirable impacts it was intended to mitigate. Implementation monitoring can occur anytime after activities are completed. Effectiveness monitoring on the other hand should occur only after at least one wet season has passed since the completion of harvest or road construction activities.

Visual observation was the predominant method used by watershed specialists to monitor the implementation and effectiveness of BMPs during 2003. Field-related implementation monitoring for timber harvest and road construction/decommissioning activities is primarily conducted during regular inspections made by timber sale administrators and/or engineering representatives

Visual observations related to the effectiveness of BMPs for timber sales and road construction work are also made during the regular field inspections by timber sale administrators and/or engineering representatives during the life of a multi-year project. Resource specialists such as hydrologists and soil scientist are consulted if BMP effectiveness issues are identified.

Cumulative Watershed Effects Analyses

During 2003, a watershed cumulative effects analyses for the Slinky and Imp timber sales on the Clackamas River Ranger District were completed using the Aggregate Recovery Percentage (ARP) methodology. On the Eastside of the Mt. Hood National Forest, work continued on the Juncrock and Bear knoll Environmental Impact Statements, which are incorporating cumulative effects analyses using the ARP methodology. Work continued on existing projects that have already had cumulative effects analysis completed.

Effectiveness Monitoring

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 are:

Observing the effectiveness of waterbar spacing and construction for preventing erosion off a skid trail. During 2003, this type of effectiveness monitoring was primarily done by timber sale administrators and watershed specialists making visual observations during the course of their field visits.

Monitoring turbidity (water clarity) following the removal of a culvert on a decommissioned road in the Bull Run watershed, to determine whether mitigation measures are minimizing sediment inputs to the stream.

Bull Run Road Decommissioning Monitoring

Forest Service monitoring activities within the Bull Run Watershed focused on monitoring the effects of specific projects on water quality. For water year 2003, monitoring projects were implemented for the Bull Run Road Decommissioning Project. The results of this monitoring are described in this document.

The road decommissioning analyzed in the 1999 Bull Run Road Decommissioning Project Environmental Assessment has been ongoing, with approximately 7.5 miles of road decommissioned in 2000, and 14.2 miles decommissioned in 2003. Project work in 2000 included 2 third order stream crossings, 6 second order stream crossings, and 25 first order stream crossings. The 2003 program included 2 third order stream crossings, 10 second order stream crossings, and 19 first order stream crossings.

A project-oriented monitoring program was developed to evaluate the potential effects to water quality from activities related to the decommissioning of roads. Road decommissioning activities included the removal of stream crossing structures, culverts, a bridge, and the fill materials covering pipes and behind abutments. The monitoring program includes several levels of monitoring: procedural, inventory, and water quality sampling. The information obtained from this monitoring program may be used to help evaluate agency annual compliance and reporting with the Bull Run Management Act, PL 95-200, as amended by the Oregon Resources Conservation Act (ORCA), 1996.

The primary objective for this project-oriented monitoring program is to assess the level of impacts from road decommissioning activity on water quality that eventually serves as raw water for Portland's drinking water supply, and also provides important habitat for a variety of aquatic organisms. Another objective is to assess levels of potential cumulative effects to water quality from road decommissioning activities.

Associated with the objectives are various forms of monitoring. The traditional forms of monitoring which have been identified and followed for more than a decade in the Bull Run Watershed are procedural, inventory, and water quality sampling

Procedural Monitoring

Procedural monitoring is a process by which the site-specific soil and water protection measures for a project are carefully tracked from planning to implementation. An example is ensuring that mulch and native seed mix to re-vegetate disturbed areas is applied at the planned rates.

A watershed specialist made at least weekly visits to the road decommissioning operations to check progress and review that the water quality protection BMPs were implemented. The entire project completed in 2003 was inspected. Site visits focused on:

- Diverting of flows during fill and culvert removal
- Procedures for shaping and fiber-matting the streambed
- Pipe removal process
- Compacting the channel banks and side slopes
- Placing rocks and large woody debris in the stream channel
- Equipment staging and operation
- Use of certified weed-free annual ryegrass or wheat straw, native seed mixes and application rates
- Ensuring that Bull Run erosion, spill prevention, and sanitation measures are being used

Annual effectiveness monitoring visits were made to the entire project to review how well the applied BMP's functioned. The 1027 road was surveyed in the summer of 2003 for the entire section that was decommissioned in 2000. Results of this survey indicated that water quality protection measures were functioning as designed with minimal surface erosion or streambed and bank erosion noted. It is planned to resurvey the sections decommissioned in both 2000 and 2003 in the summer of 2004.

Inventory Monitoring

Inventory monitoring is a process to evaluate activities which could affect water quality, but which cannot be measured through water sampling. An example would be use of photo-points to measure obvious erosion, surface or mass movements, at road crossings and to monitor the rate of re-vegetation.

Photo-points would be located at selected road crossings. Photo points may be re-photographed every year until the site had re-vegetated or as soon as possible following a major flow event such as a 5-year storm. Photographs may be used to identify whether surface or mass erosion has occurred at a representative portion of the crossing and its side slopes. Should large changes occur, the volumes of material delivered to the stream channel may be estimated by using the photos to make site measurements.

Photos detailing stream crossing at Nanny Creek, West Fork Hickman Creek, Hickman Creek, Log Creek, and No Name Creek have been completed, and are planned to be re-photographed in the summer of 2004.

Cross sections and longitudinal profiles may be established to assess channel bed and bank erosion at Shady Creek and Falls Creek because of the large fill associated with Shady Creek and large flashy nature of Falls Creek.

Water Quality Sampling

Water quality sampling is the process of sampling the characteristics of the water column from a specific point (spatial) on a waterbody at a specific point in time (temporal). Often, to best isolate the effects to water characteristics from some activity, it is necessary to sample immediately above and below the activity as close as possible to it. Examples are unusual storm events, which may produce unexpected amounts of erosion or erosion beyond the area of disturbance that still enter the stream.

Stream sampling sites above and below road crossings have been established at Nanny Creek, No Name Creek (at the junction of the 1015 and 1015144 roads), and Falls Creek in order to evaluate water quality effects for turbidity. At the project monitoring sites a comparison of the turbidity data above and below the project area before, after, and during the project will be used to characterize levels, duration and changes in sediment production from representative project sites.

Due to the inaccessibility of the project area during the winter months, automated sensors able to sample turbidity are used. Turbidity sensors with a self-cleaning wiper are used to measure turbidity levels at half hour intervals.

Campbell CR10X data loggers store several months turbidity data collected each half hour. Use of telemetry was planned to permit data access during and following major storms. At this point in time, telemetering the data from the remote sites has proved problematic, due to a number of factors including excessive draw on the batteries, data logger programming issues, and finding suitable areas to store the data that is telemetered via satellite.

The Nanny Creek monitoring site is currently not operational. During the winter of 2001/2002 the shelter at the site was crushed by an extreme snowload. The equipment was re-mounted on the antennae tower, because a new shelter could not be carried in due to very difficult access. Late in the fall of 2003, the monitoring site stopped telemetering data for reasons that are unclear (bears have frequented the site and have destroyed equipment in the past) and before a site visit could be arranged, an early November snowstorm prevented access. An attempt will be made to rebuild the site in the summer of 2004, to enable collecting and telemetering the data during the winter of 2004/2005.

The No Name Creek site is operational with turbidimeters above and below the road crossing. This site is currently not telemetering data, so the data has to been manually collected from the datalogger. The data was not collected in time to analyze for this report, so it will be summarized in next years report. The Falls Creek site is also operational with turbidimeters above and below the road crossing. This site has not been decommissioned yet, so the data is not being telemetered and will be analyzed in next years report.

Log Creek was monitored from August 19, 2003 to September 17, 2003 to assess the impacts of removing the bridge at this site. This monitoring project consisted of placing a YSI model 6600 sonde instream, to record stream stage, turbidity, temperature and conductance downstream of project activities. For this part of the project, there was no in-channel work, because the surfacing, stringers, and crib logs were removed from both sides of the bridge by different excavators (the excavator was not allowed to cross the stream). The stream was captured and diverted through a pipe during bridge removal, and landscape cloth was installed over the stream to capture any material that fell from the decking or the log stringers.

Results from monitoring activities indicate that there were short-term levels of elevated turbidity on August 20th during project activities for short durations between 0800 and 1900 (1 incident between 5 and 10 nephelometric turbidity units (NTUs), and one incident approximately 25 NTUs with turbidity levels reaching background levels by 22:00 that evening.

Figure 2-8. Log Creek Turbidity

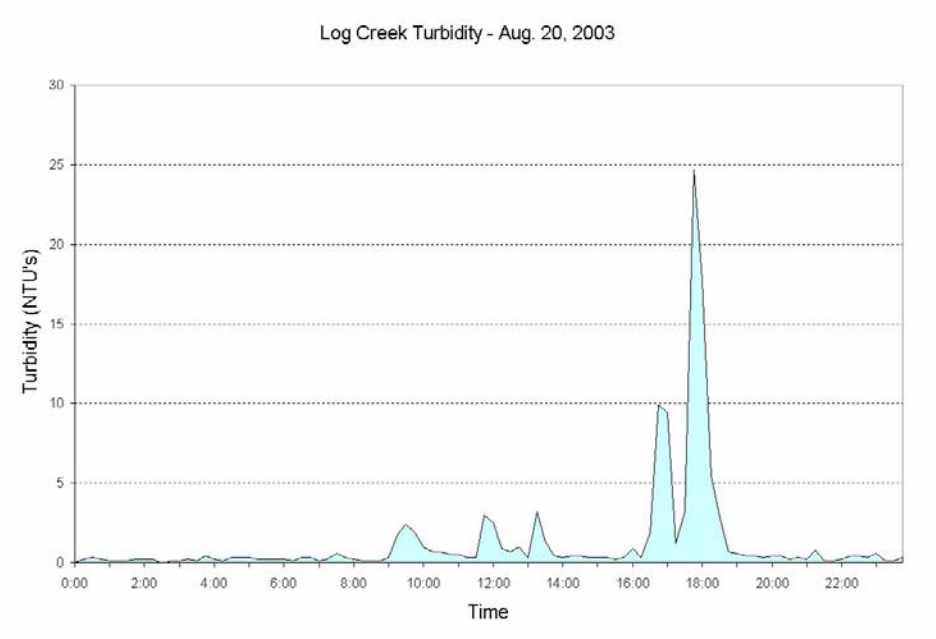
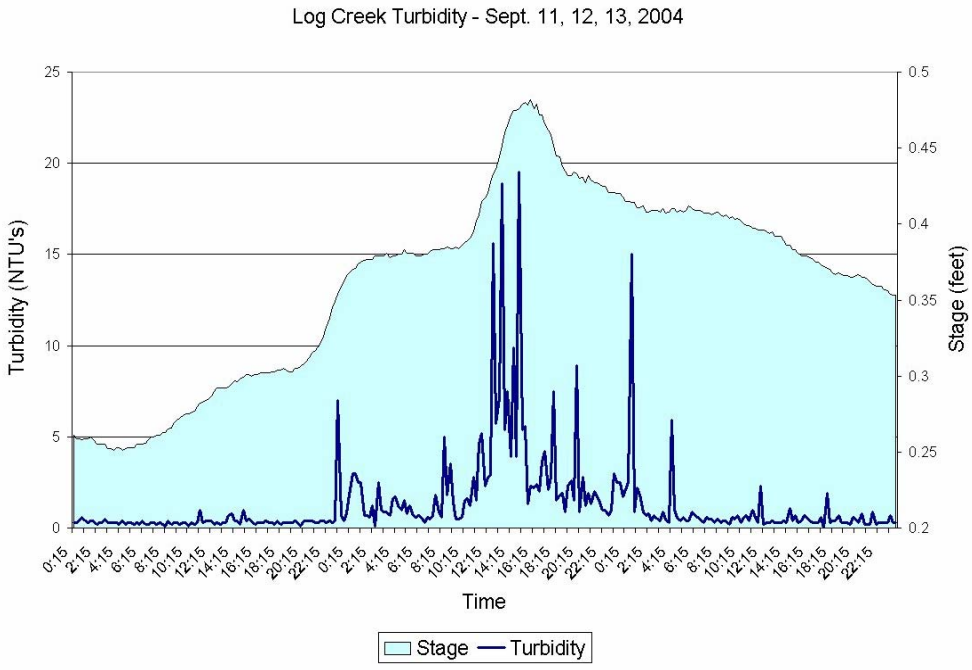


Figure 2-9. Log Creek Turbidity



Monitoring for the entire period indicates turbidity levels were less than 1.0 NTUs 95% of the time, with the elevated turbidity levels (above 0.5 NTUs) during the project (for a short duration) and for two storm events in September. During the storm events turbidity levels rose with the hydrograph and quickly dropped back to background levels when stream flow dropped.

Monitoring results indicate that there were short term elevated levels of turbidity during bridge removal activities which may be associated with the bridge removal or may be from personnel accessing the stream to operate the pump during stream dewatering activities. Due to the short-term duration of the higher turbidities and relative low levels (the highest level recorded was 25 NTUs), it appears that the water quality protection BMPs associated with the bridge removal were effective.

Trend Monitoring

Trend Monitoring is conducted to monitor the quality of water (temperature, turbidity, pH, etc.) flowing from larger watershed areas over time. Water quality data collected during trend monitoring is not designed to determine whether BMPs are effective for a specific project, but rather to provide information that may be helpful in assessing whether Forest and Northwest Forest plan standards and guidelines protecting water quality in a watershed where various resource management and restoration activities have been conducted over a period of time. Trend monitoring also provides important information to determine whether water quality is being maintained or improving over time.

Water Temperature Monitoring

Water quality standards are also regulatory tools used by the Oregon Department of Environmental Quality (DEQ) and the federal Environmental Protection Agency (EPA) to prevent water pollution. The Federal Clean Water Act requires States to adopt water quality standards. States submit their standards to EPA for approval.

The approved DEQ water temperature standards in effect for the summer of 2003 are as follows:

The seven (7) day moving average of the daily maximum shall not exceed the following values unless specifically allowed under a Department-approved basin surface water temperature management plan:

- **64° F[1] (17.8°C[2]),** where salmonid fish rearing has been identified as a beneficial use;
- **55° F (12.8°C)** during times and in waters that support salmon spawning, egg incubation and fry emergence from the egg and from the gravels;
- **50° F (10°C)** in waters that support Oregon Bull Trout.

The Oregon DEQ has developed an interim guide (Table 2-9, see below) for the period of time the 12.8 °C. standard for salmon spawning applies in the Hood River Basin, while the interim guide for when the salmon spawning standard for the Clackamas River is between September 15 through June 15.

[1] Degrees Fahrenheit
[2] Degrees Celsius

The following new water temperatures standards are in effect after March 2, 2004; compliance with these new standards will be evaluated in next year's monitoring report:

- The seven-day-average maximum temperature of a stream identified as having salmon and steelhead spawning may not exceed 13.0 °C (55.4 °F) at the times indicated on maps and tables (http://www.deq.state.or.us/wq/standards/WQStdsFinalFishUseMaps.htm);

- The seven-day-average maximum temperature of a stream identified as having core cold water habitat use on sub-basin maps may not exceed 16.0 °C (60.8 °F);

- The seven-day-average maximum temperature of a stream identified as having salmon and trout rearing and migration use on sub-basin maps may not exceed 18.0 °C (64.4 °F);

- The seven-day-average maximum temperature of a stream identified as having a migration corridor use on sub-basin maps and tables may not exceed 20.0 °C (68.0 °F)

- The seven-day-average maximum temperature of a stream identified as having bull trout spawning and juvenile rearing use on sub-basin maps may not exceed 12.0 °C (53.6 °F). From August 15 through May 15, in bull trout spawning waters below Laurance Lake on the Middle Fork Hood River, no more than a 0.3 °C (0.5 °F) increase between the water temperature immediately upstream of the reservoir and the water temperature immediately downstream of the spillway when the ambient seven-day-average maximum stream temperature is 9.0°C (48°F) or greater, and no more than a 1.0°C (1.8°F) increase when the seven-day-average stream temperature is less than 9°C.

Barlow Ranger District

Summer water temperatures for the year 2003 on the Barlow Ranger District were reflections of the hotter than normal air temperatures and the lower than normal precipitation, with some streams having slightly higher than the previous year's 7-day maximum average stream temperatures. The water temperature monitoring program consisted of monitoring 29 sites on 16 streams (see Table 2-2). In the Miles Creek Watershed, 7 sites in 5 different streams were monitored, and in the White River Watershed, 22 sites in 11 streams were monitored. Some sites where data had been collected for several years previously were not monitored in 2003, while 8 new sites were added. The new sites included Gate Creek at the 4811 road crossing, Frog Creek (mouth) above the confluence of Clear Creek, 3 sites at the diversion of Clear Creek ditch area, and 3 tributaries of Badger Lake.

Optic Stowaways were used to record water temperatures every hour. DEQ stream temperature protocol was followed, conducting pre- and post-calibrations of the stowaways, with three in stream audits during the summer using a NIST thermometer. The Stowaways were installed in May in lower elevations and working upward in elevation, with all being installed by the first of July. Normally the Badger Lake area has not been snow-free until later, but due to low snow packs it was accessible earlier. All Stowaway data loggers were retrieved by the first part of November.

Almost all streams reached their daily maximum temperature on July 22. The only stream going dry was Gate Creek at Forest Boundary, which was the result of beavers damming the creek upstream of the monitoring site. The sites that didn't not meet the State standard of 17.8°C for the 7-day average maximum water temperature were Ramsey Creek at the new Forest boundary, Rock Creek at the Forest boundary, Clear Creek above the Clear Creek ditch diversion, Badger Creek at the Forest boundary, Badger Creek below Badger Lake, and Threemile Creek at the Forest boundary.

Table 2-9. DEQ Interim Spawning and Incubation Criteria (12.8 °C) Application for Hood Basin

Hood Basin Stream Segments	Dates for Anadromous & Resident Species	Dates for Tributaries w/ only Resident Species
Mainstem Hood River to Powerdale Dam	9/15 - 2/15	1/01 - 7/15
Mainstem Hood R. u/s Powerdale Dam to confluence w/ Middle F. & East F.	9/01 - 7/15	1/01 - 7/15
Middle Fork Hood River	All Year	1/01 - 8/31
West Fork Hood River	All Year	1/01 - 8/31
East Fork Hood River d/s of confluence w/ Emil Creek	9/15 - 7/15	1/01 - 7/15
East Fork Hood River u/s of confluence w/ Emil Creek	9/15 - 8/31	1/01 - 8/31
Neal and Whiskey Creeks	9/15 - 7/15	1/01 - 7/15

The Clear Creek site and the Badger Lake site are directly below small reservoirs. Both streams met the state 17.8°C water temperature standard downstream.

None of the Forest boundary water temperature monitoring sites on Ramsey, Badger, and Rock Creeks have met the 17.8°C standard during the past 5 years, while the water temperature monitoring site on Threemile Creek at the Forest Boundary site has always met the standard. The above streams had less stream flow in July and August than normal for that time of year. As usual, their stream temperatures were also influenced by the low elevation and sparse streamside vegetation. As a result of watershed restoration work, all streams are in a recovery stage.

Camas Creek on the meadow is a naturally warm site, with flat, open with slow moving water. Downstream 2 miles, the stream cools and has met State standards for the last 8 years.

Considering the drought conditions with low snow pack and warmer than normal air temperatures, streams did not record as high temperature as predicted.

The three main tributaries to Badger Lake were monitored for the first time to see what effect they have on the temperature of the lake. All of these sites had almost the same stream flow when summer and ending audits were conducted. There are also many seeps too small to monitor flowing in on the southwest side of the lake. Most were still flowing in August and October. The three monitored tributaries had maximum 7-day average maximum stream temperatures of 12.0, 10.0, and 11.7°C with a maximum yearly temperature of 12.6°C, for the highest daily maximum for the three sites. Any effect these tributaries have on the high lake water temperature would be positive.

Sites with high temperatures will continue to be monitored yearly. Ramsey Creek and Rock Creek have had intense restoration projects completed in the last few years and hopefully this has a positive effect on future stream temperatures.

Table 2-10: Results of Water Temperature Monitoring on the Barlow Ranger District

Temperature Monitoring Site	Maximum 7 day Average Water Temperature (°C)		Daily Maximum Water Temperature (°C)	
Miles Creeks	**2002**	**2003**	**2002**	**2003**
Ramsey Creek (New Forest Boundary (Bdry.)	21.4	21.5	22.6	22.4
Eightmile Creek (Forest Bdry.)	14.9	15.4	16.2	16.1
Eightmile Creek Head (Rd. 44)	9.5	10.6	10.1	11.0
Fifteenmile Creek (Forest Bdry.)	16.2	17.4	16.7	18.1
Fifteenmile Head (15 mile CG)	9.8	11	10.4	11.7
Fivemile Creek (Forest Bdry.	16.4	17	17.0	17.8
Fret Creek at Wilderness Bdry.	9.4	10.8	10.1	11.3
White River	**2002**	**2003**	**2002**	**2003**
Rock Creek (Forest Bdry.)	18.7	19.8	20.4	21.2
Gate Creek (Forest Bdry.)	19	dry	22.6	dry beaver dam
Badger Creek (Forest Bdry.)	22.5	21.8	23.8	22.6
Badger Creek (below Badger Lake Dam)	19.7	21	21.09	21.7
Badger Creek at Wilderness Bdry.	Not measured	17.6	Not measured	18.3
Camas Creek (2 miles downstream of Camas Prairie)	15.1	15.2	15.7	16.0
Threemile Creek (Forest Bdry.)	16.5	17.9	16.8	18.6
Threemile Creek at Stockton Quarry)	11.7	12.0	12.3	12.7
Tygh Creek (Forest Bdry.)	14.7	15.3	15.7	15.9
Little Badger Crk.(Wilderness Bdry.)	16.6	17.3	17.8	17.9
Jordan Creek (Forest Bdry.)	15.6	16.4	17.0	17.3
Clear Creek above diversion ditch	new	19.6	new	20.7
Clear Creek below diversion ditch	new	15.8	new	16.7
Clear Creek at Keeps Mill	14.7	15.1	15.9	15.7
Gate Creek at rd.4811	new	11.5	new	12.0
Badger Lake Tributary #1	new	10	new	10.5
Badger Lake Tributary #2	new	11.7	new	12.3
Badger Lake Tributary #3	new	12	new	12.6
Frog (above confluence of Clear Crk.)	new	14.1	new	14.7

Clackamas Ranger District

Year-round water temperature monitoring sites were operated in the following six sub-watersheds of the Upper Clackamas in 2003: Fish Creek, Oak Grove Fork, the Big Bottom reach of the Upper Clackamas, Roaring River, North Fork Clackamas, and the Collawash River. Water temperatures were recorded once per hour using an Onset brand Optic Stowaway data logger. The measured water temperatures in these streams were evaluated relative to the DEQ water temperature standard of 17.8°C. for rearing, and the 12.8°C. standard for spawning through fry emergence between the dates of September 15 and June 30. Results of water temperature monitoring at these year-round sites on the Clackamas River Ranger District are summarized below in Table 2-11.

Temperature records from several year-round sites were discontinuous. The Collawash data-logger ceased to function during the late fall or winter of 2003. The North Fork Clackamas data-logger was lost to high flows during the winter of 2002/2003, and was not replaced until October, 2003. The Roaring River data-logger was briefly stranded in late August during extreme low flows, while the Fish Creek data-logger was out of water due to low flows from late July through early September. The maximum water temperatures of the year are believed to have been collected for all stations except the one in the North Fork Clackamas River. No days exceeding the DEQ water temperature standard of 17.8°C. were recorded in the Roaring River. The 17.8°C water temperature standard was exceeded at least once in the Collawash River. The 12.8°C water temperature standard was exceeded between the dates of September 15 and June 30 at least once in Fish Creek, Roaring River, and the Collawash River. Temperatures were not monitored in the North Fork Clackamas River during the key periods, when DEQ standards were most likely to have been exceeded.

Table 2-11: Results of Water Temperature Monitoring on the Clackamas River Ranger District.

Site	Dates	Maximum 7 Average Water Temperature (°C)	Days exceeding 17.8°C 7 day average max. water temperature	Days over 12.8°C rolling 7 day average water temperature
Fish Creek	1/1-12/31	*	*	61
Oak Grove Fork Clackamas River	1/1-12/31	17.1	0	0
Big Bottom (Upper Clackamas)	1/1-12/31	13.5	0	0
NF Clackamas River**	10/10-12/31	12.6	0**	0**
Collawash River	1/1-10/8	20.4	47	50
Roaring River	1/1-8/24, 9/8-12/31	16.0	0	6

* Due to low flows, Fish Creek datalogger was out of water from about late July to early September.
**Station located about 3 miles downstream of NF boundary. Summer water temperature was not monitored.

Hood River Ranger District

Nineteen sites on 15 streams were monitored for water temperatures with continously-recording thermographs (Onset's Tidbits) from summer to fall of 2003. Continuous recording water temperature data loggers were installed at these sites to collect temperature data for a wide variety of reasons, including compliance with state water quality standards, data collection for fish habitat assessments, post project monitoring for restoration projects, potential or documented use by bull trout and/or anadromous fish or sensitive species.

Monitoring sites include: W. Fk. Hood River, East Fork Hood River (2 sites), Ditch Creek (2 sites), Greenpoint Creek, McGee Creek, Robinhood Creek (2 sites), Meadows Creek(2 sites), Tilly Jane Creek, Doe Creek, Clear Branch, Coe Branch, Eliot Branch, Jones Creek, N. Fk. Mill Creek and Neal Creek.

Onset tidbit data loggers programmed to collect water temperature every 30 minutes were used at all of the sites. Equipment was tested for accuracy both pre and post deployment using the procedure identified in the stream temperature protocol section of the Oregon State Water Quality Monitoring Guidebook. Sites were checked mid-season to ensure data quality and each site is documented with exact location coordinates and photos.

General findings are summarized below:

Three of the nineteen sites exceeded the 17.8ºC standard for the 7-day average maximum (see table below). These sites were on Ditch Creek, located directly downstream of the Greenpoint Reservoir. This reservoir was nearly drained and the data loggers were approximately 80 percent out of the water by the time the loggers were pulled in October. It appears that the data loggers became exposed to the air in the beginning of September, and the above stated days above the 17.8°C threshold are excluding any days beyond this point. These temperature extremes may be due to the reservoir draining warmer stagnant sun saturated water from the top of the lake.

All sites except Greenpoint Creek exceeded the 10º C standard at some point during deployment of the data loggers. Creeks that contain bull trout and exceeded the 10º C standard were Eliot Branch, Coe Branch, and Clear Branch. The highest 7-day maximum average temperatures for Clear Branch was 10.7º C, which is very close to the standard. Coe Branch and Eliot Branch had 7-day maximum average temperatures of 12.6º C and 14.3º C respectively.

Clear Branch remains one of the streams with the coolest recorded water temperatures, exceeding the 10°C threshold only 11 times. This stream drains a glacier and hosts a significant population of Bull Trout, a threatened species on the endangered species list. Greenpoint Creek also recorded exceptionally low temperatures, with the maximum temperature recorded at 9.2°C.

Tilly Jane Creek's data logger is located just upstream of the confluence with the East Fork Hood River. The stream stays relatively cool throughout the entire summer, with only 12 days above 10°C, exhibiting that the entire system may be ideal for salmonids. At a near location is the lower East Fork Hood River site that recorded 109 days above 10°C, and 68 above 12.8° C. Tilly Jane Creek is a nice reprieve from the river for cooler water species.

Recording only three days of average temperatures above 10°C, is the uppermost site of the two on Robinhood Creek. The stream on the upper extent runs through forested woodlands. At the data logger retrieval in October, there was not much flow in the creek, but it does appear that the water temperatures stay cool throughout the summer, even with little flow. Just above its confluence with the East Fork Hood River is the second site in Robinhood Creek. The creek has experienced large scale mudflows in recent years, and the channel is reclaiming itself through excessive amounts of fine glacially-eroded volcanic sediment. This lower data logger recorded high temperatures in comparison with the upper site, 109 days averaging above 10°C, and 66 above 12.8°C. These sites are within a few river miles of each other, representing some significant warming as the water travels downstream.

Two monitoring sites are located within Meadows Creek, another glacially originating stream. The uppermost site provided data which appears to consist of anomalies. Temperature swings of 10°C and above occur during the months of June and early July, followed by much less exaggerated daily temperature differences throughout the months of July, August, September and October. The daily temperature differences during these latter months generally ranged from two to five °C. The lower Meadows Creek monitoring site experienced greater daily minimum and maximum temperatures differences throughout June and early July as compared to the following months, also. The greatest daily differences were approximately four °C. at the lower site, with the daily temperature differences decreasing to around two degrees, later in the summer and fall.

Coe Branch is a channel experiencing a significant amount of aggradation in its lower extent. When we retrieved the equipment in October, it was buried beneath about three feet of cobble and gravel. The datalogger placed in June had disappeared before the mid-season check in late July. The stream appears to stay relatively cool, however, with only 42 days exceeding the 10° C threshold, and none above 12.8° C.

An adjacent stream to Coe Branch is Elliot Branch, with the data logger located just above an irrigation outflow site. This stream records on average, significantly higher temperatures throughout the summer months in comparison with Coe Branch. Eighty days averaged above 10°C along with 14 above 12.8°C. Apparently the geographically close location of Coe Branch in relation to Elliot Creek does create a similar temperature regime.

The upper East fork Hood River site also lost a data logger, but it was data containing the latter half of the summer. The data we have occurs from the beginning of June until the end of July for 51 days. Of these, 27 exceeded the 12.8°C threshold. The lower East Fork Hood River exhibits a full season's worth of data, with 75 days exceeding 12.8°C and 116 days exceeding the 10° C threshold. The temperature readings show similar trends and number of days above the various thresholds (10°C, 12.8°C, 17.8°C) as compared to the summer of 2001, another low water year. These two years exhibit the highest maximum temperature trends of nine years worth of temperature monitoring at this site. It is interesting to note that throughout the summer, it was common for the lower East Fork Hood River site to record a difference between the maximum and minimum daily temperatures commonly between 6 and 8°C. This was among the most pronounced daily temperature changes of the 19 data recording sites on the Mt. Hood National Forest.

The West Fork Hood River recorded 29 and 90 days above 12.8 °C and 10°C, respectively. These temperatures relate to those of two of its tributaries, Jones Creek and McGee Creek. Average daily temperatures recorded above the 10°C threshold were 90 for Jones and 87 for McGee Creek. Similarly, 22 days were recorded above the 12.8°C threshold for Jones Creek, with McGee recording a slightly higher 32. These sites are in similar geographic locations, and interestingly, the tributaries relate closely in temperature to the main stem river.

In general, the temperatures recorded this year throughout the forest appear to be higher than most other year's data. In 2003, Oregon experienced a similarly low flow year, and, in a lot of cases, recorded higher temperatures than we noticed this year. These two years stand out as having significantly higher stream temperatures, with corresponding low volumes of water, for the sensitive fish species to survive in.

Overall, the temperature regimes within the Forest Service lands are adequate to sustain salmonid species. There are, however, 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.

Table 2-12: Results of Water Temperature Monitoring on the Hood River Ranger District

Stream Name	Maximum 7 day average water temperature (°C.)	Days Exceeding 17.8°C.	Days Exceeding 12.8°C.	Days Exceeding 10.0 °C.
Clear Branch	10.7	0	0	11
Coe Branch	12.6	0	0	44
Ditch Creek	21.7	76	112	113
Ditch Creek	26.2	75	112	113
East Fork Hood	16.6	0	75	116
East Fork Hood	15.5	0	27	43
Elliot Branch	14.3	0	14	35
Greenpoint Creek	9.2	0	0	0
Jones Creek	13.4	0	22	90
McGee Creek	15	0	32	87
Meadows Creek	12.7	0	0	68
Meadows Creek	17.9	3	79	85
Neal Creek	14.1	0	28	96
North Fork Mill Creek	13.4	0	5	29
Robinhood Creek	15.2	0	66	109
Robinhood Creek	10.6	0	0	3
Tilly Jane Creek	10.4	0	0	12
West Fork Hood	13.7	0	29	90

Zigzag Ranger District

Baseline water temperature data was collected at 18 sites on the Zigzag Ranger District and is summarized in Table 2-13 below.

All stations monitored except the lower Little Sandy River, the Bull Run River below the reservoirs, and Mud Creek below Trillium Lake met the State 17.8°C standard for the 7 day average maximum stream temperature for rearing habitat.

Temperature issues for these sites are being assessed in the Sandy Basin Total Maximum Daily Load (TMDL) Process being conducted by the Oregon Department of Environmental Quality.

Table 2-13: Summary of Stream Temperature Monitoring Results - Zigzag Ranger District

Site	Monitoring Period	Maximum 7 Day Moving Average Of Maximum Daily Temperature ^{0}C	Date of Maximum Temperature
Bull Run River (above reservoirs)	June 1 - Oct. 1	16.1	July 21
Fir Creek	June 1 - Oct. 1	14.6	July 30
North Fork	June 1 - Oct. 1	12.4	July 22
South Fork	June 1 - Oct. 1	15.9	July 21
Upper Little Sandy	July 8 – Oct. 8	17.0	July 21
Middle Little Sandy	July 8 – Oct. 8	Battery Died	
Lower Little Sandy (USGS gaging station)	July 7 – Oct. 15	19.8	July 20
Little Sandy at Bull Run River	July 7- Oct 1	18.7	July 21
Bull Run River below Reservoirs	June1 – Oct. 1	20.3	Sept. 3
Upper Eagle Creek	July 9 – Oct. 15	17.1	July 27
Lower Eagle Creek	July 9 – Oct.15	17.7	July 20
Salmon River at Linney Creek	June 27-Oct 6	13.8	July 21
Linney Creek at confluence with Salmon River	June 27-Oct 6	10.3	July 29
Zigzag River at Forest Boundary	July 8-Oct 14	14.0	July 21
Sandy River at Forest Boundary	May 8-Oct 14	17.0	July 28
Gordon Creek at Forest Boundary	July 7 – Oct 6	12.7	July 29
Mud Creek below Trillium Lake	June 27 – Oct 6	21.0	July 28
Bear Creek at Zigzag	July 16 – Aug 4	13.1	July 29

Continuous Water Monitoring Stations

Eagle Creek

An automated water monitoring station was installed in December 2001 on Eagle Creek, just a short distance upstream of the U.S. Fish and Wildlife Service fish hatchery, and approximately 4.0 miles downstream of the National Forest boundary. The monitoring station was located as close to the National Forest boundary as possible, but potential influences on water quality from lands in other ownerships downstream of the National Forest boundary may exist. One of the key objectives of this monitoring station is to quantify water quality downstream of National Forest lands on Eagle Creek, where the Eagle Creek timber sale was partially implemented several years ago. Turbidity, water temperature, pH, conductivity, and flow depth are continuously monitored at 15 minute intervals.

Average monthly water quality data for 2003 are listed in Table 2-14 below, based on a preliminary analysis of the data. The peak water temperature reached about 70.6º F. on July 21, 2003. The 7 day average maximum water temperature was 68.6º F, which is above the 64º F State standard (in effect for 2003) for salmonid rearing in the summer months. The 7 day average maximum water temperature approximately 4.0 miles upstream near the National Forest boundary was 63.9 º F, just below the 64 º F State standard. The difference in water temperature between the Eagle Creek fish hatchery and the National Forest boundary is due to natural warming and possibly stream shade removal. The average water temperature during July was 61.3º F.

Average turbidity at this monitoring site is relatively low throughout the year, with average values of 2.0 NTUs or less from April through November, 2003. The maximum recorded turbidity in 2003 was 181.0 NTU, during a very high flow event at the end of December 2003. In some cases, measured peak turbidity values may be affected by Eagle Creek Fish Hatchery personnel cleaning leaves and other debris off the intake structure a few feet upstream from the monitoring station. During the winter of 2004/2004 fish hatchery personnel will be asked to record when they clean the intake structure, so erroneous turbidity measurements can be eliminated from the dataset.

Overall water quality at this monitoring site was very good for much of the year.

Table 2-14. 2003 Eagle Creek Monthly Water Quality Parameter Averages

Month	2003 Water Quality Parameters (monthly averages), Eagle Creek			
	Turbidity (NTU)	Water Temperature (°F)	pH	Conductivity microS/cm
January	4.2	42.0	7.2	33.4
February	1.6	40.9	7.2	31.7
March	2.9	42.0	7.2	28.7
April	0.5	42.7	7.2	29.0
May	0.6	46.4	7.3	30.2
June	2.0	55.2	7.4	37.3
July	0.3	61.3	7.5	42.0
August	0.2	60.2	7.6	43.8
September	0.5	55.2	7.5	44.5
October	1.1	50.3	7.4	42.9
November	1.4	41.0	7.3	36.5
December	2.3	41.3	7.2	32.6

Clackamas River (Carter Bridge)

The Carter Bridge water monitoring station was established in December 1999 to record the water quality of the Clackamas River as it left the Mt. Hood National Forest, and to provide the downstream water providers an early warning of turbidity problems. The station is located on the Clackamas River at Carter Bridge, one half mile below the confluence of Fish Creek. Items recorded at 15 minute intervals are date and time of collection, turbidity, water temperature, depth, specific conductivity and pH. Water quality data is available via telephone at various Mt. Hood National Forest and Clackamas County water provider offices.

Average turbidity at this monitoring site is relatively low throughout the year, with average values of less than 1.0 NTUs from April through October, 2003. During non-storm periods turbidity is normally between 0.2 and 2.0 NTUs. During stormy periods when the river rises, instream turbidities can increase to about 150 NTUs. The peak water temperature reached about 64.3º F. on July 22, 2003. The 7 day average maximum water temperature was also below the 64º F State standard (in effect for 2003) for salmonid rearing in the summer months. The average water temperature during July was 58.3º F. Overall, water quality is very good at this particular monitoring site on the Clackamas River.

Table 2-15. 2003 Clackamas River (Carter Bridge) Monthly Water Quality Parameter Averages

Month	2003 Water Quality Parameters (monthly averages), Carter Bridge, Clackamas River			
	Turbidity (NTU)	Water Temperature (°F)	pH	Conductivity microS/cm
January[3]	10.8	41.2	7.5	40.3
February	6.8	41.0	7.4	44.3
March	7.5	42.8	7.7	38.5
April	0.9	43.9	7.7	43.5
May	0.6	48.0	7.7	46.6
June	0.4	54.8	7.9	58.0
July	0.4	58.3	7.9?	65.7
August	0.5	56.5	8.1	69.0
September	0.4	52.7	8.0	70.0
October	0.5	49.3	8.0	68.3
November[4]	-----	------	-----	-----
December[5]	2.5	39.1	-----	48.5

[3] Equipment problems during February 22 through March 7,2003.
[4] Data collected from November 1, through December 21, 2003 lost due to power surge damaging datalogger.
[5] Data collected starting December 22, 2003 with YSI 6600 sonde (temporary) while equipment was being repaired. The YSI 6600 sonde was not equipped with a pH probe.

Alder Creek

In a cooperative effort between the Forest Service, Bureau of Land Management, and the City of Sandy, turbidity monitoring 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 stations measure stream stage and turbidity with the data telemetered to the Zigzag Ranger Station. The Alder Creek site has been collecting turbidity data since August of 2001. Stage data has not been collected due to problems with pressure transducers at this site. The East Fork Alder Creek site has been collecting turbidity data since September 2000 and stream stage data since August 2001. Data is logged to the datalogger at each site every ½ hour. Data from both these sites is telemetered via cell phone and problems with the telemetry from both sites has occurred in water year 2003. Available data will be manually downloaded and summarized in next years monitoring report.

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 eight 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 (Outside of Bull Run)

The Forest funded a telemetered USGS stream gage on Fish Creek (Clackamas River Ranger District), and has re-established a discharge measurement gage at a previously decommissioned USGS gaging station on the Upper Clackamas River at Big Bottom. Stream flow 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.

As part of the Watershed Analysis Process monitoring questions and data gaps were identified for each watershed. One of the monitoring opportunities and associated data gaps identified was stream flow data on Still Creek. This site was identified as critical due to it’s association with the smolt trap used to assess salmonid escapement from Still Creek.

In order to address the monitoring question/data gap an Aqua Rod was installed in Still Creek where Still Creek intersects the 20 road. The Aqua Rod is an instrument that can measure stream stage to the nearest millimeter. It is planned to measure stream discharge at different stream stages in order to develop a rating curve for this site.

Timberline Ski Area Water Quality Monitoring

This following report summarizes the annual monitoring report for the Timberline Ski Area prepared by Golder Associates Inc. Seattle, Washington. A more detailed summary report regarding this monitoring is on file at the Zigzag Ranger District Office.

The Timberline Ski Area has operated a skiing venue for over forty years at the Palmer snowfield on Mt. Hood, Oregon. Salt is applied to the Palmer snowfield during summer months to condition the snow surface and maximize its use for skiing. Salt (sodium chloride) has been applied on the Palmer snowfield since the early 1950's, and has expanded since that time to accommodate increased skiing opportunities on the Palmer snowfield.

Timberline Ski Area has conducted an on-going annual surface water-monitoring program since 1988 to evaluate any potential effects to downstream surface water from salting on the Palmer snowfield. Over the years, additional data needs have been recognized, and the surface water-monitoring program has been modified and expanded to fully characterize the potential effects of salting on the environment. Currently, Timberline Ski Area manages a comprehensive environmental monitoring program that incorporates surface water quality monitoring, environmental fate assessments, salt composition analyses, and an overall salt management program.

This report presents the annual water quality analysis for the Timberline Ski Area for water year (WY) 2003 (October 1, 2002 to September 30, 2003). This evaluation was prepared in accordance with the Salt Management Plan developed by Timberline in 1996. The Salt Management Plan provides a framework for the management of all aspects of salt application on the Palmer snowfield, including all environmental evaluations. The data presented in this report are supplemented by historical data collected by Timberline from 1988 to 1989 (CH2M Hill) and from 1990 to 2000, which were presented in reports prepared by Golder Associates (Golder).

Water Quality Standards

In 1996, Timberline submitted an application to the Oregon Department of Environmental Quality (ODEQ) for certification pursuant to Section 401 of the Federal Clean Water Act in conjunction with issuance of the Forest Service Special Use Permit for the Timberline Ski Area on the Mount Hood National Forest. After review of the application for compliance with the applicable provisions of Oregon Administrative Rules (Chapter 340, Division 41), and the specific provisions of the Sandy River Basin (Sections 482 and 485 of Division 41), the ODEQ provided recommendations for certification at Timberline based on several general and special conditions. Timberline conducted various biological, hydrogeological, and hydrological evaluations from 1997 to 1998 to fulfill the conditions specified by ODEQ. The results of these evaluations were summarized in the Certification Summary Report (Golder 1998).

As part of the certification process, ODEQ provided Timberline with several special conditions specific to the Timberline area to be fulfilled. ODEQ specified the following water quality conditions:

- Instream water quality at continuous monitoring sites and monitoring stations downstream of continuous monitoring sites shall not exceed the weekly mean total dissolved solids (TDS) guidance value, or specific conductance guidance value if used as a substitute for TDS, of 117 mg/L TDS or 175 umhos/cm specific conductance;

- Water quality samples shall not exceed the secondary drinking water criterion of 250 mg/L for chloride;

- Water quality samples shall not exceed the National (EPA 440/5-88-001) freshwater chronic toxicity criterion for aquatic organisms of 230 mg/L for chloride; and

- Water quality samples shall not exceed the National (EPA 440/5-88-001) freshwater acute toxicity criterion for aquatic organisms of 860 mg/L for chloride.

Discussion

Salt Application

Salt was applied to the Palmer Snowfield on nearly a daily basis from May 19 to September 16, 2003 (with nearly two weeks off in early September). The total salt application to the Palmer Snowfield in WY 2003 of 1,132,680 pounds, was just above the average salt application for the previous four years (1,105,195 pounds).

Chloride and specific conductance typically decrease in the Salmon River and Still Creek during WY 2003 winter months. Short-term seasonal changes in chloride and specific conductance are observed in the upper elevation stations and lower elevation (2000 feet) stations in Salmon River and Still Creek in response to salt application on the Palmer Snowfield. The concentrations observed in lower elevation streams are typically near the range of concentrations observed in background streams.

The period of Sept 2–9, 2003 saw an acute increased in chloride, TDS and specific conductance at West Fork (140-150 umhos/cm), Salmon River, Still Creek Camp Host (high elevation Palmer drainage streams), White River 4230(background stream) and Salmon River 2000. In addition, TDS was elevated over the same time period in Still Creek Camp Host and White River (TDS not measured in West Fork or Salmon River 2000). Golder considers these elevated levels are likely anomalous, possibly due to sampling error/contamination, as they occur on drainages both within and outside of the Palmer drainage area they occur at both high and low elevations and nearby sampling stations did not exhibit similar increases.

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

Chloride and specific conductance at lower elevation (2,000 ft) stations typically increase slightly in late summer, but decline over the winter months. However, there is little variation, as the concentrations observed in lower elevation streams are typically near the range of concentrations observed in background streams.

Table 2-16: Data From 2003 Water Year Report

Sampling Site	Chloride (mg/l.)	Conductivity (umhos/cm)	TDS (umhos/cm)
Magic Mile 6000	n/a	34(*suspect*)	n/a
West Fork of Salmon	mean of 4.9	40-70	84(9/18)
Salmon River 3445	mean of 9.4	130	42(5/27) 110 (10/05)
Salmon River 2000	below 5	36-77	n/a
Camp Creek Host Site 38	at or below 15	110-150	70-120
Still Creek 2000	below 5	40-120	n/a
Control Streams			
Camp Creek 3400	below 5	29-63	24-89
Little Zigzag 3140	below 5	29-63	24-89
White River 4230	at or below 5	50-100	24-89 (330 on 9/11)

Still Creek is affected by inflows from Mineral Creek and Mineral Spring. This is evident by the observation that Still Creek Camp Host 3800, located above the confluence of Still and Mineral Creeks, contains lower stream temperatures, and lower chloride and specific conductance levels than Still Creek 3600, located below the confluence of Still and Mineral Creeks. Similarly, Mineral Creek 3800 and Mineral Spring contain higher temperatures, and higher chloride and specific conductance levels than both Still Creek Camp Host and Still Creek 3600.

Conclusions

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

The total salt applied to the Palmer snowfield in WY 2003 was 1,132, 680 pounds, which was just above the average salt application total for the previous four years of 1,051,195 pounds. The snowpack and total precipitation for WY 2003 were the second lowest observed in the 15-year record keeping at Timberline. The WY 2003 snowpack and total precipitation were 58% and 77% respectively of the previous ten year period.

Stream flow in Salmon River and Still Creek was less than WY2002 as a result of lower precipitation and snowpack .

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. Background levels for chloride is approximately 5mg/L and between 25-100 umhos/cm for conductivity.

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 low flow at the end of the summer results in increased concentrations of chloride, specific conductance, and TDS occur during the low flow period at the end off the summer because of the reduced dilution of snowmelt runoff from 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 datalogger and stream flow gage at Still Creek Camp Host 3800 provide data that represent Still Creek without the influence of Mineral Creek and Mineral Spring. The Still Creek Camp Host 3800 station better monitors the effects of salt application at the Palmer snowfield on Still Creek.

Laboratory and datalogger measurements of chloride concentrations in the Salmon River and Still Creek in WY 2003 are low, and remain substantially below aquatic water-quality standards.

Laboratory weekly mean measurements of specific conductance in the Salmon River and Still Creek in WY 2003 are all below the ODEQ guidance value of 175 umhos/cm with the exception of the period of Sept. 2 –14 at Stioll Creek Camp Host 3800. As described previously Golder states this is most likely a sampling collecting or laboratory error.

Weekly mean TDS levels for stations withn the Palmer Drainage were below the 117mg/L ODEQ criterion for WY 2003 with the exception of Still Creek Camp Host 3800 during the period of Sept. 2-16 (five weekly means between 128 and 197 mg/L. Golder states this is likely a sample collecting or laboratory error.

Recommendations

Best Management Practices

Continue implementation of the Best Management Practices Evaluation Process (BMPEP).

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

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.

Trend Monitoring

Continue both baseline and project-related water temperature monitoring Forest-wide. For those streams identified as exceeding state water quality temperature standards, do additional monitoring in 2004 to determine if the water temperatures are naturally elevated. If the elevated water temperatures are a result of management activities or wildfire, evaluate restoration options. Continued water temperature data collection will most likely be required as part of the Implementation Plan for the recently released TMDL for the Hood River Basin.

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.

Road Decommissioning Monitoring

Continue planned implementation, effectiveness and water quality monitoring of road decommissioning activities in the Bull Run watershed.

Timberline Ski Area Water Quality Monitoring

Timberline should continue collecting datalogger measurements of chloride, conductivity, and temperature in Salmon River and Still Creek. The dataloggers provide very useful information for monitoring the water quality at these stations on a nearly continuous basis.

The dataloggers should be recalibrated and inspected annually to ensure that they function properly and are operating within calibration standards. The optimal time for recalibration is late fall (October or November) after the salting has stopped, and before significant snowfall has begun.

Timberline should continue collecting field measurements and samples for laboratory analyses at least three times per week in WY 2004, and then reduce to once per week beginning WY 2005.

The long-term goal for monitoring at Timberline is to use the dataloggers as the primary monitoring tool at the 4,000 ft elevation in the Salmon River and Still Creek since they provide nearly continuous monitoring of stream water quality. The dataloggers require further evaluation against laboratory data and further recalibrations to ensure that the dataloggers provide reliable and accurate representations of the in-stream water quality. Once it has been shown that the dataloggers provide reliable and accurate data for these streams, the sample collection for laboratory analysis should be reduced to once per week for about three years, and then to once per month for the long term.

Transportation/Roads

Goal

Provide safe and efficient access for those who use the transportation system for recreation or management of the National Forest.

Road Management

The Mt. Hood National Forest continues to advance toward the objectives of the Forest Service Roads Agenda:

- We are decreasing the size of our transportation system.
- We are maintaining or improving our 620 mile mainline road system.
- We are decommissioning, closing or downgrading the maintenance levels on the remainder of our 3,450 mile road system.
- Our priority in road decommissioning continues to be decommissioning roads in unstable geological areas or roads with unacceptable environmental impacts.
- Due to the high cost of road decommissioning, we have been focusing efforts on storm-proofing and closing roads.

Approximately 50% of our 3,450 mile road system is either closed to public access or classified as "available for closure or decommissioning." Many of these roads are being closed naturally by brush. Gates, barricades and berms are used to close some roads but these closure devices are often vandalized and rendered ineffective. In FY02 we began constructing deep, rough water-bars on roads where road closure devices are frequently vandalized. These water-bars serve two purposes:

- They drain water of the road to prevent erosion.
- They also discourage use by making the roads uncomfortable to drive.

These water-bars have significantly reduced the cost of repairing vandalized gates and barricades.

Although detailed statistics were not available at time of printing for this report, accomplishments for FY03 included a small amount of new road construction and road decommissioning, with significantly more miles of road reconstruction and storm proofing.

Reductions of road densities in the thirteen key watersheds is a primary road objective of the Northwest Forest Plan. Road densities in twelve key watersheds have been significantly reduced since the Northwest Forest Plan was implemented in 1992. Road density in the thirteenth key watershed has remained unchanged since 1992.

Some effects of downsizing the road system are as follows:

- Only one main route will be mainained 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

Partnerships for road maintenance continue with the City of Portland in the Bull Run watershed and with the Oregon Department of Transportation on roads adjacent to the state highways. The Mt. Hood National Forest has used the Payments to Counties Act (Payco) to fund some road maintenance projects. The largest partner to our roads program continues to be the timber sale program with its program of road reconstruction and road maintenance to provide safe, economical timber haul.

Funding for road maintenance has decreased in recent years while the aging road system deteriorated at an increasing rate. Most of our road system was constructed 30 to 50 years ago. Maintenance funding has decreased at a time when it should be increasing to keep pace with the road system's increasing rate of deterioration. The trend of the road maintenance budget can be seen in the table below.

Table 2-17. Road Maintenance Budget

	FY 1989	FY 2002
Annual Road Maintenance Needs	$5.2 million	$2.0 million
Annual Road Maintenance Budget	$3.8 million	$0.8 million
Percent of Needs Met by Budget	73%	40%

The road maintenance budget has declined because of decreased timber sale road maintenance deposits and declining appropriated funding in the National Forest Service roads budget. The need for road maintenance has declined because of the declining heavy vehicle traffic use (i.e. log trucks), road closures, and a decrease in the prescribed level of maintenance on open roads. However, as the above table shows, we have not been able to decrease our needs fast enough to keep pace with the decreasing budget. Out of necessity we have focused our limited road maintenance funds on the highest priority roads, primarily the low clearance passenger car roads that access major recreation destinations. The table below displays our road maintenance priorities and accomplishments.

Table 2-18. Road Maintenance Priorities

	Total Miles on the Mt. Hood NF	Percent Maintained to Standard in FY02
Passenger Car Roads	643	61%
High Clearance Roads	1,150	37%
Closed Roads	1,649	25%

Deferring road maintenance to future years will lead to additional unsafe or unusable roads. Three solutions to this spiraling increase in road maintenance needs are:

- Decrease the standard of the roads. Maintenance of passenger car roads is five times more expensive than maintenance of high clearance roads.

- Close or decommission more roads. Road decommissioning is typically 2-3 times more expensive than road closure when discounted over a ten-year period. So for economic reasons, the forest has been focusing on road closures.

- Seek alternative funding sources for road maintenance.

The Mt. Hood roads engineering department has aggressively pursued the first two alternatives listed above. We have been less successful at generating additional funds for road maintenance.

Recommendations

- Identify forest priorities in capital investment projects that meet the objectives of reducing road system miles or downgrading road maintenance levels.

- Consider the five transportation management objectives listed at the beginning of this report during the budgeting process.

- Enhance long-term road management objectives and maintenance needs in forest initiatives, activities, programs and responses to catastrophic events.

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 existing and established winter communal roost areas. The overall monitoring concern relates to bald eagle recovery objectives and are they being met on the Forest.

Specifically, known and identified potential bald eagle nest and roost sites are monitored to determine if they are protected in accordance with the Forest plan and the USFWS Recovery Plan. Also, activities which might affect habitat used by bald eagles are reviewed for compliance with FSM 2670 and Forest-wide standards and guidelines. Population numbers are also tracked.

Results

In 2002, a mistake in communication occurred about the status of the bald eagle nest at the Clear Lake nest site and sale administrators were not aware of the fact that a historic nest was now occupied and the sale was not modified according to Forest Plan and USFWS guidelines. The existing 100 foot buffer, silvicultural prescription, and seasonal restrictions proved adequate to allow for successful nesting of the pair in 2003. A new bald eagle nest was identified in 2003 and is located near Rock Creek Reservoir. The site was occupied and with young.

One former nest site was monitored in 2002 by Frank Isaacs. The site was found to be occupied and produced young. No communal roosts have been located on the Forest but an individual roost site was identified. This site had a planned thinning sale surrounding the nest site. The site received a 100 foot no cut buffer around the nest because it was unoccupied at the time the sale was planned. This site was logged in the fall of 2002. The site was occupied in 2003 and fledged one young eagle.

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). Several monitoring questions were developed to track Northern Spotted Owls. They are as follows:

- *Are spotted owl network sites identified ad being maintained in correct numbers, size, distribution and habitat quality to meet R6 direction and Forest standards and guidelines?*

  The strategy for managing spotted owls has changed. Instead of specific network sites, there are now identified LSRs (Late Successional Reserves) and 100 acre LSRs for known sites. These areas are being maintained.

- *Is the Forest maintaining capability to support the number of pairs of spotted owls within reserved lands, general Forest and Spotted Owl Habitat Areas (SOHA)s over time and/or habitat.*

  The Nortwest Forest Plan strategy has been implemented and the reserve areas are being maintained.

- *Are spotted owls outside of SOHAs located? Are these pairs reproducing at least once every 3 years?*

  The SOHA strategy was replaced by Late Sucessional Reserves with the implementation of the Northwest Forest Plan. There is an interagency demographic study that is designed to sample a fixed population of owls stratified across the range of the owls. The demographic study is designed to be statistically significant in monitoring the owl population across its range. This has replaced the monitoring of owls on individual Forest. The demographic study reported a decline in spotted owls of 2.8% per year for Oregon.

- *Are all activities that might effect SOHAs being monitored for compliance with standards and guidelines?*

  The SOHA strategy is no longer used. The LSRs are being maintained for compliance.

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. There will be little opportunity to increase the monitoring effort for the current year. The demographic study referred to above indicates a declining population.

Peregrine Falcon

The peregrine falcon was delisted and is no longer considered threatened or 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. Monitoring questions concerning the Peregrine Falcon are as follows:

- *Are all of the known pairs of peregrine falcons on the Forest Protected?*

  Yes. One pair has had the road that accesses the area gated. The other nest is on a major system road. No projects are planned in the immediate vicinity.

- *Has all identified potential habitat been validated?*

  Surveys were done prior to 2000 but there have been no current efforts to establish presence or absence on new sites.

- Have identified areas been surveyed for occupancy?

  A Forest Service volunteer monitored one cliff site because a falcon was seen flying in the vicinity. There are insufficient personnel to do additional surveys.

- *Have peregrine falcons begun to use identified sites? Are populations increasing?*

  It is not known if the populations are increasing. There are insufficient personnel to survey all of the potential sites.

Results

Monitoring for peregrine nesting in 2003 was confined to the two known nest sites. Both of the sites were successful. There were two young fledged from one site and three from the other. One of the peregrine sites has been gated and fenced to protect the site from disturbance. A management plan is complete for one site and is in draft form on the other.

Lynx

Lynx is listed as threatened in Oregon by the U.S. Fish and Wildlife Service. The Mt. Hood National Forest currently has no mapped lynx habitat. Lynx habitat is based on availability of adequate amounts of subapline fir plant associations. Based on the Lynx Conservation Assessment and Strategy at least 10 square miles (6400 acres) of primary vegetation (i.e. subapline fir) should be present within a lynx analysis unit to support survival and reproduction. The Forest has approximately 1270 acres of subalpine fir plant associations. Therefore, we lack the minimum criteria to identify lynx habitat and develop a lynx analysis unit. However, over the past several years there have been about 13 unconfirmed lynx sightings across the Forest. Most if not all lynx sightings on the Mt. Hood National Forest are probably bobcats that have been misidentified as lynx. Any lynx sightings are probably transient individuals that have left good habitat due to population crashes of snowshoe hares, escaped pets, or misidentified bobcats.

Results

A lured marking station protocol, Twenty-five transect with five stations, was utilized across the forest to determine the presence of lynx. Fourteen hair pads from 10 transects had hair samples. An independent study of snow conditions was initiated on one district but no evidence of lynx were found. Based on trapping records the Oregon Department of Fish and Wildlife feels this species has been extripated from Oregon or never existed in the state. If lynx are present on the Forest their numbers are extremely limited. Surveys for lynx were completed in 2001 and no lynx were documented from here or on the Gifford Pinchot to the North or the Willamette or Deschutes National Forest to the south.

A cooperative effort with the Cascadia Wild Trapping club to document and monitor carnivore presence was initiated in the year 2000. Both winter snow tracking and latter remote camera stations have been used to try to document the presence of rare carnivores. A combination of efforts involving members of Cascadia Wild, Teachers in the Woods, and Forest Service Employees were used in these surveys. At this time no lynx or wolverine have been documented.

Sensitive Wildlife Species

Red-legged Frog

The red-legged frog was removed from the Regional Forester's Sensitive Species List in FY 2001. The Wetland Wildlife Watch surveys indicated they found red-legged frogs and egg masses in the Bull Run reservoir, Dinger Lake Timothy Lake and Little Crater Meadow in 2003. The EDAW consultants working for the Federal Energy Resource Commission (FERC) relicensing effort for the Clackamas Hydroelectric Project located many populations and individual red-legged frogs in the Clackamas River drainage The population trend for this species across the Forest is unknown although it appears to be an regular breeder across much of the landscape.

Harlequin Duck

Harlequin Ducks were not surveyed in 2003. Incidental sightings of the ducks were made by Char Corkran and Alan Dyck on the Clackamas River and Hood River respectively. No reproduction was observed during these sightings.

Sandhill Crane

The sandhill crane was removed from the Regional Forester's Sensitive Species List in FY 2001. 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 during the 2003 season. Volunteers with Wetland Wildlife Watch and Portland Audubon Society and Forest Service employees were used to maximize the effort. There were 12 adults and 2 colts observed.

Cope's Giant Salamander

A survey for Cope's giant salamander was conducted on the Forest by volunteers from the Wetland Wildlife Watch. There was one sighting of Cope's Giant Salamander in the Bull Run Watershed during the survey.

Townsend's Big-Eared Bat

The Townsend's Big-eared bat was removed from the Regional Forester's Sensitive Species List in FY 2001. No surveys were conducted specifically for this species this in 2003. The distribution and population trend across the forest is unknown.

A bat survey was performed by PGE biologist as part of the FERC relicensing for the Clackamas Hydroelectric Project. The results of the survey are in the Bat Surveys Final Report (FERC nos. 135 and 2195) dated June 2003. Most of the survey centered around buildings and bridges associated with the Clackamas project. Bats were detected at 9 structures. Four bats were located at Timothy Lake Lodge and five were along the Oak Grove pipeline. *Myotis lucifugus* and *M. californicus* were identified but no big-eared bats were identified.

Wolverine

No aerial surveys for wolverine tracks were conducted in 2003 and no individuals were observed. Instead there was a remote camera project that was aimed at photographing forest carnivores on the Mt. Hood. The results are summarized below under Remote Camera Surveys.

Common Loon

The common loon was removed from the Regional Forester's Sensitive Species List in FY 2001. Surveys were conducted by the Wetland Wildlife Watch volunteers in 2003. One loon observation was made in the Bull Run Watershed. Nest platforms have been installed on Upper and Lower Bullrun Reservoirs but no nesting has occurred at this time.

Snags and Down Woody Material

- *Are numbers, sizes, species and distribution of wildlife trees prescribed in EA's and other planning documents being retained on harvest units to meet at least 60% of biological potential over time, as required by standards and guidelines?*

  Inventories on Clackamas River Ranger District indicate compliance with standards and guidelines. Most of these inventories are associated with KV snag creation monitoring.

- *Are existing snags and replacement trees marked for retention surviving harvest activities and remaining suitable for predicted length of time?*

  Snags are surviving harvest activities according to monitoring surveys on Clackamas River RD.

- *Are wildlife trees being used by primary and secondary cavity nesters?*

  Monitoring results are difficult to interpret and a full analysis of the data has not taken place. But monitoring surveys appear to indicate that wildlife trees are being used by cavity users but probably not at the same rate as naturally created snags due to a difference in the way rot occurs in the trees.

The Northwest Forest Plan provided for 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 woody material. Monitoring of these snags occurs in relation to KV projects.

Clackamas River Ranger District performs a variety of snag and down wood monitoring projects in association with their KV and wildlife program. The Clackamas River RD results indicate that snag and downwood guidelines are being met.

Summer and Winter Range

Summer and winter range concerns are tracked as follows:

- *Do winter range areas currently provide proportions of optimal/thermal cover and forage in suitable distribution as designated in S&G? If not, have silvicultural prescriptions been prepared for achieving standards?*

  Thermal cover is not limiting on the Mt. Hood National Forest. Forage for elk is a limiting factor on Mt Hood. A reduction in timber harvest has proven to be difficult situation for providing a good distribution of forage in winter range areas.

- *Do proposed management activities and facility developments comply with the standards and guidelines?*

  Road densities in winter range in most watersheds are above the standard suggested by the Forest Plan. Efforts are ongoing to remedy this where possible.

- *Is condition of winter range being maintained?*

  Winter range areas continue to move away from early seral stages as timber harvest has been reduced. Forage opportunities continue to decline.

Discussion

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 elk use monitoring occurs in conjunction with KV plans and 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.

With a reduction in regeneration harvest on the Forest and the suppression of fire the dense nature of the habitats in the western cascades will produce less and less forage for deer and elk. Forage is a limiting factor for much of the Mt. Hood National Forest. In the interest of ecosystem health the Forest has reduced the amount of non-native grass and forbs it plants for forage. It is inevitable that populations of deer and elk will decline unless some method of creating or maintaining openings for these species is implemented. The following are the professional assessment of the current deer and elk situation.

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 maintained constant. Populations appear to be stable. Video technology has been used to monitor KV 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 in decreasing. In the district biologist opinion the populations of deer and elk are stable on the district.

Deer and Elk Population Objectives

Although the Mt. Hood National Forest does conduct regular meetings with the Oregon Department of Fish and Wildlife, our discussions revolve around harassment and habitat issues. It is the States responsibility to manage population numbers and it is the Forest Service responsibility to manage habitat and harassment issues. Population estimates and objectives for deer and elk can be found in the ODFW management plans for these species. The population objectives for the state are based on their habitat units and are difficult to correlate to the Mt. Hood NF boundaries.

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

Monitoring concerns for Pine Marten and Pileated Woodpeckers are as follows:

Are sufficient numbers of habitat management areas provided to meet the distributional pattern of one area every 5 miles for pileated woodpeckers and one every 2 miles for pine marten? Does the habitat within identified habitat areas meet Forest definition as suitable mature/old growth forest?

The Northwest Forest Plan eliminated the need for management areas for these two species. Management of Late Successional Reserves and snag and downwood guidelines will more than meet the requirements for pileated woodpecker and pine (American) marten habitat. Remote Camera and tracking surveys show good populations of marten over the areas surveyed.

- *Are habitat areas providing for viable populations?*

  Late successional reserves, riparian reserves, and wilderness areas are providing sufficient habitat and anecdotal evidence indicates the populations appear viable. Remote camera and tracking surveys have shown good populations of marten. Snag monitoring on Clackamas River Ranger District show good populations of pileated woodpeckers.

- *Do all management activities planned within woodpecker and marten areas meet standards and guidelines?*

  There are very few management areas currently set aside separately from what the Northwest Forest Plan has designated for late successional species. These areas appear to be functioning as good habitat for these two species. Very little management activity is occurring in the late successional or riparian reserve areas. A handful of the former B5 pileated woodpecker areas were retained in areas where it was thought that the habitat may be limited in that particular watershed. Very little activity has occurred in these retained habitats.

Remote Camera Survey Effort

A remote camera survey project was initiated in 2002. Earlier Camera and tracking efforts were done in the 1990's. Wolverine tracks were identified in 1990 in the Bull Run and at Snow Bunny Snow Park. Also a pilot project with the Teachers in the Woods program was initiated in 2002 to refine the remote camera techniques. The full survey was implemented with Cascadia Wild Tracking Club. The current effort was to record carnivore species occurrence. Three species, wolverine, fisher, and American marten were the primary targets of the survey. Of the three mustelid species, the marten was recorded numerous times. No wolverine or fishers were recorded. Tracking efforts and the cameras surveys were done in partnership with the Portland based Cascadia Wild Tracking Club. Their efforts were invaluable to the success of this survey. Besides providing valuable data this cooperative effort also was able to involve the public in the inventory process. This effort has been continued into FY04. The following table summarizes the results of the survey effort.

Table 2-19. Species Observed from Mt. Hood Forest Remote Camera Transects

	Sessions		
	I/II	III	IV
Black Bear	11	22	0
American Marten	50	7	0
Bobcat	15	3	41
Flying squirrel	16	4	0
Pygmy Owl	0	1	0
Turkey Vulture	3	4	0
Fisher	0	0	0
Wolverine	0	0	0
Spotted Skunk	25	0	80
Striped Skunk	0	0	9
Deer	5	0	0
Elk	3	0	0
Chipmunk	25	0	0
Douglas Squirrel	5	0	0
Vole/Mouse	2	0	0
Clark's Nutcracker	3	0	0
Gray Jay	70	0	0
Raven	41	0	0
RedTailed Hawk	2	0	0
Steller's Jay	32	0	0
Varied Thrush	2	0	0

Table 2-20. Summary of Species Detected, Number of Records, Session Dates, and Elevations

Site Name	Elevation	Species Detected	Number of Individual Hits
Session 1 & 2 (July 2002 – April 2003)			
Badger Lake	4600-5400 ft	Gray Jay, Steller's Jay, Turkey Vulture, Clark's Nutcracker, Raven, Black Bear, Bobcat, Douglas Squirrel, Flying Squirrel,Deer, Elk, Chipmunk	101
Bull Run	1115-1849 ft	Gray Jay, Raven, Red Tailed Hawk, Steller's Jay, Bobcat, Vole/Mouse, Spotted Skunk, Flying Squirrel	74
Cloud Cap/Tilly Jane	4000-6000 ft	Gray Jay, Steller's Jay, Clark's Nutcracker, Raven, Black Bear, Elk, Deer, American Marten, Flying Squirrel	95
Laurence Lake	2816-3504 ft	Steller's Jay, Bobcat, American Marten, Spotted Skunk, Flying Squirrel, Vole/Mouse	38
Gnarl Ridge	4800-6000 ft	Black Bear	2
Session 3 (July – September 2003)			
Cathedral Ridge	4300-4800 ft	Flying Squirrel, Black Bear, Turkey Vulture	5
Pinnacle	4200 ft	Black Bear, Turkey Vulture	3
Tilly Jane/Cloud Cap	5356-5900 ft	Pine Marten, Black Bear, Turkey Vulture	8
Badger Creek	4850-5725 ft	Pygmy Owl, Black Bear, Bobcat, Flying Squirrel, Turkey Vulture	20
Vista Ridge	5125 ft	Black Bear	2
Eden Park	5000 ft	Black Bear, Flying Squirrel	3
Session 4 (October – December 2003)			
Bull Run	3100-4000 ft	Bobcat	5
Bull Run	1300-1800 ft	Bobcat, Spotted Skunk, Striped Skunk	125

Snag Density

Biologist 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 2-21. Wildlife Resource Monitoring Results

Elements	FY 98
Peregrine Falcon Nest Sites	2
% Projects Meeting Bald Eagle S&Gs	100%
No. of Known Spotted Owl Sites Monitored	1
% 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.
- Continue use of prescribed fire to enhance big game forage areas on east side districts.
- Implement additional surveys for Wolverine and Fisher to verify sighting reports.

Northwest Forest Plan – Survey and Manage Species

Unfortunately there was insufficient funding to put together a summary report and there was no compilation of data to summarize for this monitoring report. In March 2004, a Record of Decision was signed, entitled: To Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines. This document will change how the Forest handles the species formerly considered Survey and Manage species.

Mollusk

Efforts to survey for Survey and Manage mollusk species were conducted by the Forest Survey Crew in 2003. Unfortunately there was insufficient funding to put together a summary report and there was no compilation of data to summarize for this monitoring report.

Larch Mountain Salamander

Efforts to survey projects for Larch mountain salamander were undertaken in FY 2001. Several Larch mountain salamanders were discovered during the strategic surveys at CVS plots but no Larch mountain salamanders were found during project surveys. 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.

One result of the Larch mountain salamander surveys was to expand the known range and numbers of the Oregon slender salamander on the Barlow and Hood River Districts. Efforts have been made to include these records in the ONH program database so they can make refinements in their range and distribution.

Red Tree Vole

Surveys have been completed for this species on the west side of the cascades on the Mt. Hood. The Pacific Northwest Research Station contracted to do strategic surveys across the range of the Red Tree Vole. Several sites were recorded and confirmed on the Mt. Hood.

Wildlife Sustainability

Wildlife Habitat

Seral Stages

Many wildlife species fall into one of two categories of seral stage or successional stage, either late or early stage. Even though the species may be dependant on one stage or another they may at times use both. Examples of late seral species are animals such as spotted owls or red tree voles. Examples of early seral species are elk, blue birds, and Townsend's solitares. Both habitats are equally important to the species that use these stages. The Northwest Forest Plan focused on protecting the late seral habitats because forest practices were quickly liquidating this habitat. We now have plans to manage for these habitats across the landscape. These late seral habitats are managed as late successional reserves, congressionally withdrawn areas, riparian reserves, and wilderness. Most wildlife biologist believe that this habitat has been sufficiently protected to sustain late seral species. Late seral habitat is difficult to create and it takes many years to produce the size and structure that it takes to sustain late successionally dependent species.

Early seral habitats are much easier to produce and can also be produced by naturally occurring catastrophic events such as fire, windstorms, insect outbreaks, and manmade events such as timber harvest. However, there is less planning involved in developing early seral habitat. A continuous supply of early seral habitat well distributed across the landscape would be optimum to sustain good populations of early seral obligate species. With the emphasis on protecting late seral habitats, invasion by noxious weeds, normal succession, effective fire suppression, and the changes in timber harvest practices early seral habitats are becoming increasingly more valuable and in demand by wildlife. To sustain these early seral obligate species there should be increased awareness and planning for allowing fires to open up habitat, allowing naturally and fire created openings to seed in naturally instead of planting, placing less emphasis on controlling wildlife damage to young trees, and regeneration harvest instead of thinning. Openings created by timber harvest should be planned to provide a continuous rotation of openings adjacent to mature areas. Since the emphasis on managing the land for late seral habitat old concepts of planning for a continuous rotation of early habitats has fallen by the wayside but should not be abandoned. To ignore this early age structure is to ignore the majority of species using the Forest.

Forest Fragmentation has been a major concern of ecologist for many years now. There are many detrimental effects of forest fragmentation. Increased predation, nest parasitism, microclimate changes and insufficient habitat to maintain some species populations are all the result of fragmentation. The answer to this issue is to maintain large contiguous blocks on the landscape to ensure that fragmentation effects are minimized. This does not however mean that every small block of timber should be eliminated or that every stand needs to be pushed into this same prescription. In order to maintain viability of some less mobile species isolated small blocks can serve as a reserve until adjacent stands can develop sufficient maturity to allow emigration into the stand. At the same time when these small blocks are no longer needed as reserves they can then become early seral habitat where there is none. These isolated blocks can also serve as dispersal habitat for species as they leap frog from large block to large block.

Riparian Habitat

Riparian habitat has the highest wildlife use of all habitats on the Forest. With the practice of managing for Riparian Reserves this habitat is well protected and there should be very little concern for sustainability of species requiring this habitat.

Wetlands

Wetlands are very important to the species that use them. Several species considered sensitive use these habitats on the Mt Hood. Oregon spotted frogs and sandhill cranes (sensitive in Washington only) utilize wet meadows. Many other species also use these wetlands for breeding, foraging, and nesting. In order to sustain populations of these species efforts should be made to reduce disturbance in these habitats. Major disturbances to the species using these wet meadows include grazing, roads, and campgrounds located adjacent to the wetland. Every effort should be made to reduce cattle grazing in these areas. Also, campgrounds which impact wetlands should be moved to less sensitive sites if possible. The presence of campers adjacent to the meadows reduces the wildlife opportunity and use in the wetland. These areas should also be avoided as fire staging and camp sites. Invasive plant species threaten these sites and increased vehicle and animal use in these meadows increases the opportunity for the introduction of weed seed. Wetlands at risk include those located on the north arm of Timothy Lake, Little Crater campground and Bonney Meadows campground.

Unique Habitats

Unique habitats are a diverse group of habitats. Caves, mines, talus, and cliffs are examples of these habitats and they can be important to bats, raptors, and small mammals such as pika. Caves and mines are the most sensitive of these habitats because roosting and maternal colonies of bats whose energy requirements are very high can be affected by human disturbance. Most of these habitats have been protected in one form or another by road closures or bat gates.

Snags and down wood

Dead or dying trees can play an important role for many birds, mammals, amphibians, mollusk, and insects. Forest plan guidelines and the Northwest Forest Plan has recognized the importance of these specialized habitats and have gone to great strides to provide for this component of habitat for the future. When timber sales are planned, money is collected in the form of Knutson Vandenberg Funds (KV funds) to create additional snags and down wood following the logging. Tree top blasting, girdling and inoculation methods are used to create this important habitat. Thousands of trees each year are added back as snag habitat. In campgrounds hazard trees are identified and removed but only after deciding if the tree top can be lowered and some portion of the snag left for wildlife. Many of the trees scorched by wildfire have also been left for wildlife and this facilitates use by species such as the black-backed woodpecker that requires high densities of snags. This has been on of the most successful programs that has been implemented.

Deer and Elk

Limiting factors for Deer and Elk are forage and usable winter range. Since the winter range on the Mt Hood is not large and expansive, there is shortage of winter forage and secure habitat. There are no broad valleys for the elk to utilize during heavy snow fall. This limits the elk population on Mt Hood. Roads can reduce the use of existing winter range and expose elk to legal hunting as well as poaching pressure. In order to sustain populations, openings must be maintained in winter range over a continuous rotation. Also roads in there areas should be closed when no longer needed.

High Elevation Species

At one time high elevation species were never threatened by human intrusion. . This is habitat that has been used for breeding for species such as gray-crowned rosey finch, horned larks, and American pipits, American marten, and wolverine.

For some species such as wolverine this was a last strong hold for their populations. Currently however this is no longer a path less trodden. Back-country use and high elevation recreation are intruding more and more into these habitats. This is placing an increasing pressure on these high elevation species. It has been estimated that 10,000 people per year climb Mt Hood. This is only part of the recreational use around these high elevation habitats. Some of these species will be affected by the increasing use of their habitat. This creates a concern for the sustainability of some of these species and an increased effort should be made to monitor these populations and to limit the amount of intrusion. At some point it may be necessary to utilize a back country permit system to control the amount of disturbance caused by hikers, skiers, and snow mobile users. Fortunately snow mobile use is not allowed in designated wilderness areas so they are not as great a concern at the highest elevations.

Connectivity Issues for Sustainability

Most of the connectivity issues for aquatic species are being resolved by correcting construction errors in fish ladders and replacing culverts with fish and amphibian friendly passage ways. This is a major benefit for both a fish and wildlife sustainability. The two other areas of connectivity that must be addressed is connectivity of habitat and road passage. The Northwest Forest Plan has been designed to provide connectivity of late successional species along the cascades. This plan was well thought out and should be adequate to sustain populations and ensure genetic viability across the cascade range.

Connectivity across roads is still an issue. This area has been addressed in Europe and in Canada with very expensive and elaborate road crossing areas for wildlife. Most of our forest roads are not a barrier to wildlife passage. Only a few roads can be considered barriers. There roads are barely passable to wildlife now due to the large amount of traffic and will only become less passable in the future. This is only a problem from a sustainability stand point when the species in question has a population that drops below a critical point. At that time connectivity across the roads can be a major issue.

The Route 26/35 corridor is the road system of highest concern on the Forest at this time. This does not mean that other roads do not have issues with connectivity but the route 26/35 corridor has such a high degree of traffic that it would be very difficult or impossible for some species to get across. Many species are sensitive to vehicle traffic and just the traffic alone would act as a barrier to them trying to cross the corridor. Those that try more than likely will be hit in the road. If we want to sustain all of our populations then this road system will need to be addressed and wildlife crossings will need to be installed at critical points. This is currently being reviewed and we will hopefully be finding solutions in the future.

People Influences on Populations

People have a substantial impact on wildlife populations. Both our activities and our presence influence habitat and reproductive success. Historically we were predators on many species. More than current hunting regulations allow. Because of that wildlife have an innate fear of people. Only in areas were animals have become habituated to us do they tolerate us. With most animals when we show up they leave and usually in a hurry. Some animals never learn to accept us as part of their environment and will pick up and leave their territory if we arrive.

We affect the sustainability of wildlife populations through a variety of our activities. We can influence them when we boat, fish, hike, hunt, ski, snowboard, camp, drive, run cattle, use off road vehicles, harvest timber, gather wood, cut Christmas trees, or collect mushrooms, to name a few. All of these things have an influence on wildlife in some way. The proximity of Mt Hood National Forest to the Portland metropolitan area this Forest gets a higher proportion of use and thus influence on wildlife than other more rural forest.

Recreation and off road vehicle plans should consider the influence on wildlife populations. Some seasonal restrictions may be need to be incorporated in some sensitive areas. Limiting or reducing campgrounds in unique habitat areas would allow better utilization and therefore sustainability of wildlife that depend on them.

Threatened, Endangered and Sensitive (TES) Plants

Sensitive Plant Species – Management Emphasis

The Regional Forester's Sensitive Species List for plants was last revised in 1999. The List includes thirty-four plant species that are documented from, or are suspected to occur, on the Mt. Hood National Forest. In 2003 as well as 2002, 2001 and 2000, monitoring has focused on nine non-forest Sensitive species. Included are yellow agoseris (*Agoseris elata),* sickle-pod rock cress *(Arabis sparsiflora var. atrorubens),* goldthread *(Coptis trifolia),* cold water corydalis (*Corydalis aquae-gelidae*), black lily (*Fritillaria camschatcensis*), Watson's lomatium (*Lomatium watsonii*), Adder's- tongue (*Ophioglossum pusillum*), violet Suksdorfia (*Suksdorfia violacea*), and pale blue-eyed grass *(Sisyrinchium sarmentosum).*

Results

Agoseris elata – This species is known from three wet meadow sites on the Mt. Hood National Forest. A search was conducted to relocate plants at a historic site at Clackamas Meadows. For the second year in a row, none were found and it is now believed that *Agoseris* is likely extirpated from the site.

Arabis sparsiflora var. atrorubens - There are several populations on the Mt. Hood National Forest; all east of the Cascade Crest. Monitoring was conducted at a site on Mill Creek Ridge adjacent to The Dalles Watershed/Research Natural Area. Grazing is not permitted in the area however for the past several years the fence between FS land and BLM land has been down in a few locations and there were recent signs of cow activity in the sensitive plant habitat. Noxious weeds (knapweed and thistle) were also observed at the site. Non-native invasive grasses at the site have also increased in density over the years.

Coptis trifolia – This species is known from two wet fen locations on the Mt. Hood National Forest as well as one site adjacent to the Forest boundary on Confederated Tribes of the Warm Springs Reservation. Monitoring was conducted at one site where it was found that permitted cattle had caused some damage to plants by trampling and dislodging soil cutbanks adjacent to a stream where plants were growing. Some herbivory of *Coptis* was also observed.

Corydalis aquae-gelidae –This riparian species is confined to the Mt. Hood, Willamette and Gifford Pinchot National Forests. Most Mt. Hood NF populations of Corydalis are located on the Clackamas River Ranger District. Monitoring continued in 2003 for those populations within the Oak Grove Fork and Stone Creek Hydroelectric Projects. For the Stone Creek Project, monitoring to determine project effects have produced preliminary results that show population numbers to be stable, however there may have been a reduction in the number of adult plants producing flowers and an increase in non-flowering individuals.

Fritillaria camschatcensis – The single population in a wet meadow on the Mt. Hood National Forest represents the southern-most extension of this species' range. Monitoring of black lily through a Challenge Cost-Share agreement with the Native Plant Society of Oregon has found the population to be stable at this time.

Lomatium watsonii – The single known population of this species on the Mt. Hood National Forest is located in a "scab flat" habitat on Hood River RD. In 2003, knapweed plants were manually pulled to reduce competition with the lomatium and limit the amount of weed seed produced around the habitat. Noxious weed encroachment continues to be a problem; hand pulling noxious weeds at the site is a continuing effort.

Ophioglossum pusillum – Two sites are known in wet meadow habitat on the Mt. Hood National Forest, Clackamas River Ranger District. Monitoring was conducted at both sites and a complete census taken. Compared to the original habitat notes from 1989, a greater number of plants were found in 2003, indicating that the population is stable. More plants were found at one site than previously observed. A noxious weed, Canada thistle, *Circium arvense,* was found to be encroaching at both sites. An aggressive competitor, continued encroachment of thistle could lead to negative impacts for adder's-tongue in the future.

Suksdorfia violacea - One known site is located on the Mt. Hood National Forest from Hood River District. This site represents one of only a few in Oregon as well as the southern-most edge of its geographical range. The site is a popular recreational rock climbing area. Cooperative management of violet Suksdorfia with a local rock climbing association continued through FY 2003. Signing and public education have reduced adverse impacts and informal census shows the population at this site is currently stable.

Sisyrinchium sarmentosum – This species is known from the Mt. Hood and Gifford Pinchot National Forests. One site is located in an active grazing allotment and monitoring was conducted in 2003 to assess whether potential impacts from cattle grazing are occurring. Grazing appears to be within acceptable parameters identified in the annual operating plan.

Mt. Hood Land and Resource Plan Monitoring Guidelines

Sensitive plant inventories have been conducted for all ground disturbing activities and implemented mitigation measures have been effective in maintaining the integrity of Sensitive plant sites. Threatened, Endangered and Sensitive plant standards and guidelines are being implemented.

Recommendations for FY2005

Agoseris elata - Continue efforts to relocate the Clackamas Meadow population. If no plants are found, assess why the population is likely extirpated and determine if management options exist to bring it back, including reintroduction.

Arabis sparsiflora var. atrorubens – Contact the BLM to repair the fence at the Mill Creek Ridge site to keep the cows within the Allotment. Develop management options for *Arabis* habitat enhancement including the use of prescribed fire.

Coptis trifolia – Work with the grazing permittee to develop methods to avoid impacts to *Coptis* including the use of a rest-rotation system or other means to graze during a less sensitive time of the year to plants. Any developed mitigations should be included in the Allotment Management Plan.

Corydalis aquae-gelidae – Continue development of a long-term monitoring plan to be included in any re-issuance of an Oak Grove Fork Hydroelectric Project license. Continue monitoring potential effects of the Stone Creek Hydroelectric Project.

Fritillaria camschatcensis - *Continue to work with the Native Plant Society to monitor black lily.*

Lomatium watsonii - Continue to manually remove noxious weeds from the Watson's lomatium site and monitor habitat trends.

Ophioglossum pusillum – Investigate the chemical treatment of Canada thistle to help maintain habitat for the known sites for this species.

Suksdorfia violacea - Continue to work with the climbing association to eliminate adverse impacts to violet Suksdorfia while allowing for managed recreational rock climbing.

Sisyrinchium sarmentosum – Continue monitoring the effects of grazing and working with the grazing permittee to protect this species. Develop mitigations to be included in the Allotment Management Plan to reduce utilization of vegetation by cattle within the wet meadows that contain *Sisyrinchium* or utilize these areas during a less sensitive time of the year when impacts can be minimized.

Recreation

Ecological System – Landscape Structure

The Mt. Hood National Forest is continuing to systematically survey and evaluate the health and long-term management of the vegetation in developed campgrounds. In the past, many trees identified with root and stem decay in the campgrounds have been removed to improve the safety for campers. In 2002, a broader approach to vegetation management was begun with an objective of long-term forest health and regeneration as well as hazard removal. In 2003, extensive field reconnaissance was completed in Green Canyon, Indian Henry, Knebal Springs, and Eightmile Crossing campgrounds by Mt. Hood NF Plant Pathologist and Measurements Specialists. The purpose of the site visit was to assess the insect and disease influences on trees in the campground and to assist in preparation of a long-term vegetation management plan. Trees identified as having a potential for failure due to disease were tagged with a permanent aluminum tag at the base of the tree.

Green Canyon Campground

The stand is predominantly western hemlock and western red cedar with some large Douglas-fir. Red alder, big leaf maple, and cottonwood are also present. A variety of sizes and age classes are present, and large trees dominate the campground. Openings in the canopy provide for good lighting. The campground is apparently sheltered from the wind, as evidenced by the very tall trees, some with intact dead tops, and little windthrow.

The stem decay fungus, *Phellinus hartigii*, is fruiting on the western hemlock. Conks of this fungus are often associated with areas of dead tissue, whether by wounding or by action of the fungus. Several conks of *Phellinus pini*, another stem decay, were evident below the live canopy of one large Douglas-fir, indicating extensive, advanced decay in the wood near the conks.

Phaeolus schweinitzii, called the velvet-top fungus or cowpie fungus, causes a red brown cubical root and butt rot in larger conifers. It develops slowly and is common on older trees, with butt swell indicating extensive decay. *P. schweinitzii* is fruiting around the bases of several of the large Douglas-fir.

The root disease and stem decay fungus, *Heterobasidion annosum*, is decaying the western hemlock, causing many basal hollows. Only a few trees were windthrown, and these had annosum root decay. Little mortality or stem breakage was seen. Western redcedar and Douglas-fir are resistant to annosum root disease, while western white pine is tolerant. Although red alder is somewhat susceptible to annosum root disease, hardwoods in general are more tolerant. *H. annosum* can infect wounds anywhere on the bole as well as actively invade roots. Stem and butt decay are common in older western hemlock, and failure generally occurs before mortality. Western hemlock with crown symptoms (chlorosis, dieback) has a high potential for failure.

No recent activity by insect defoliators or bark beetles was reported. Ants were active in decayed centers of trees, and borers were evident in dead trees and dead areas on boles. Pitch streaming on western hemlock from 2 to 6 ft above ground was caused by infection by *Armillaria ostoyae*. On several trees the cambium had been killed and the tree nearly girdled above ground. Armillaria tends to cause mortality in stressed conifers, although western redcedar is more tolerant. Trees are stressed in campsites by soil compaction and camper abuse. Stresses can also include competition and infection by annosum root disease.

Based on the findings in this report, numerous high risk trees were felled and removed from Green Canyon Campground in April, 2003. Other trees will continue to be monitored.

Indian Henry Campground

Laminated root rot, caused by *Phellinus weirii*, is active across about 80 percent of Indian Henry Campground, and the Douglas-fir within the laminated root rot area require immediate treatment. Douglas-fir is highly susceptible to laminated root rot, typically failing at the root ball

or butt before the tree exhibits crown symptoms (fading, dieback, stress cone crop). The extent of the laminated root rot was first mapped by pathologists from Forest Pest Management (FPM) in 1988. The 2003 investigation confirmed the mapped locations of laminated root rot and extended the boundaries in some places. Hundreds of Douglas-fir, have come down, died, and/or been removed since 1988. More than 20 dead trees that require removal have been flagged, and 218 trees of several species with signs and symptoms of stem and butt decay have been tagged. Of the tagged trees, 136 require removal due to their high potential for failure and potential to strike high value targets (stationary vehicles, people, structures). Of the trees that require removal, 69 are Douglas-fir with obvious laminated decay. In addition to the tagged trees, hundreds of Douglas-fir within the root rot center must be assumed to be infected and have a high potential for failure.

Most of the site is still dominated by large Douglas-fir, although the Douglas-fir continue to die or blow down under the influence of laminated root rot. The campground is apparently sheltered from the wind, as evidenced by the very tall trees, many with extensive butt decay, that remain standing. Western hemlock and western red cedar are taking an increasing role as the Douglas-fir dies out. Red alder and big leaf maple are also present. Seedling and sapling western hemlock are abundant where protected from trampling. Most of the campsites have little ground cover or screening, due to compaction and shading.

Hardwoods are immune to laminated root rot. Western red cedar is resistant, rarely expressing decline when infected. Western hemlock is tolerant to laminated root rot, usually succumbing to butt rot only after reaching about 140 years of age. Western hemlock exhibiting crown symptoms in a laminated root rot area have compromised roots and must be considered to have a high potential for failure.

Stem decay fungi are also present in many trees. The stem decay fungus, *Phellinus hartigii*, is present and fruiting occasionally on western hemlock. Conks of this fungus are often associated with areas of dead tissue, whether by wounding or by action of the fungus. A single conk indicates at least a moderate potential for failure. Many of the western red cedar are showing the crown decline typical of old western redcedar. Some of the large western redcedar have old fire scars with extensive decay, probably caused by *Oligoporus sericeomollis*, the pencil rot fungus. A few of the large Douglas-fir have several conks of *Phellinus pini*, another stem decay, indicating extensive, advanced decay in the wood near the conks. *Fomitopsis pinicola* decays heartwood and sapwood relatively quickly, and where it is fruiting on a living tree, the tree can be expected to have a high potential for failure in the vicinity of the conk. Dead trees have a high potential for failure.

Phaeolus schweinitzii is fruiting around the bases of several of the large Douglas-fir. A few large Douglas-fir have shattered at the butt due to decay by this fungus.

No recent activity by insect defoliators or bark beetles was reported. Ants were active in decayed centers of trees. Pitch streaming was not common and not consistently associated with an insect or disease condition. One declining western hemlock had mycelial fans indicating infection by *Armillaria ostoyae*. Armillaria tends to cause mortality in stressed conifers, while western redcedar is more tolerant. Trees are stressed in campsites by soil compaction and camper abuse. Stresses can also include competition and infection by laminated root rot.

In May, 2003, 136 trees were felled and removed to protect camper and visitor safety and to provide a safe and enjoyable camping experience over the long-term. Eighty-two trees were monitored during the camping season.

Knebal Springs

Tree species present include western larch, Douglas-fir, lodgepole pine, Engelmann spruce, grand fir, and ponderosa pine. Golden chinkapin is present in the understory, especially on the hill above the springs. Laminated root rot, caused by *Phellinus weirii*, is active in the open area. Several western larches have been windthrown due to roots decayed by this disease, and several standing larches have a high potential for failure due to inadequate sound rind (e.g., western larch Numbers 256 and 265). Several stumps have the laminated rot, including a stump of lodgepole

pine. The open area probably has sparse tree cover due to laminated root rot. The open area also has some amount of soil compaction due to recreational use. Soil compaction stresses trees and makes them more susceptible to root rot.

Laminated root rot can cause butt rot in older Engelmann spruce, western larch, and lodgepole pine. Douglas-fir and grand fir are often killed by laminated root rot, and can fall over before they show crown symptoms. The laminated root rot fungus spreads along root systems by means of ectotrophic mycelium. Any Douglas-firs or grand firs within 50 ft of a known infected tree or stump are assumed to be infected and have a high potential for failure (e.g., Douglas-fir Numbers 259, 260, 254). Other conifers within a root rot infection center and which exhibit symptoms of root disease, including fading crowns, branch dieback, and stress cone crops, also have a high potential for failure (e.g., Engelmann spruce Number 262).

Most of the western larches are heavily infected with western larch dwarf mistletoe. Dwarf mistletoe infection causes the formation of witches brooms. Branches of western larch are brittle, and the added weight of brooms results in branch breakage and thinning crowns. Dwarf mistletoe infection reduces tree vigor and increases susceptibility to root rot.

In the open area, many understory trees are Douglas-fir or grand fir. Under the influence of laminated root rot, these trees will likely die, or survive to become hazardous trees.

In the enclosure around the headwaters of the spring, we could see dead lodgepole pines and fading Douglas-firs. Laminated root rot is probably present within the enclosure. Many understory trees are grand fir and Douglas-fir.

Near the corral, a broken grand fir immediately adjacent to Douglas-fir Number. 263 is infected with laminated root rot. .

No recent activity by insect defoliators or bark beetles was reported.

Eightmile Crossing

Tree species within the Eightmile Crossing recreation area include grand fir, western hemlock, Douglas-fir, Engelmann spruce, ponderosa pine, lodgepole pine, western white pine, western larch, and western redcedar.

Root and stem decay caused by annosum root and butt rot, *Heterobasidion annosum*, is active in pockets. Annosum spreads by spores that infect fresh wounds and fresh stumps, and by ectotrophic mycelium that grows along the outside of root systems. Grand fir is highly susceptible to annosum and is often killed when infected. Any grand firs within 50 ft of a stump or tree known to be infected by annosum root rot are assumed to be infected and have a high potential for failure at the base (e.g., grand fir Numbers 220, 221, 222, 266, and 267). The other conifers are safe to leave within an annosum pocket as long as their crowns are vigorous. Within an annosum pocket, crown symptoms on true fir, hemlock, spruce or pine (fading, dieback, stress cone crops) indicate a compromised root system and a high potential for failure (e.g., grand fir Numbers 224 and 226). Western redcedar, larch and Douglas-fir are resistant to annosum root disease, while western white pine is tolerant. Hardwoods in general are fairly tolerant. *H. annosum* can infect wounds anywhere on the bole as well as actively invade roots. Stem and butt decay are common in older hemlock and spruce, and failure generally occurs before mortality.

The stem decay *Echinodontium tinctorium* (ET) is common on grand fir. A tree with a conk of ET has a high potential for failure near the conk, because the decay fungus works for many years before it produces a conk (e.g., grand fir Numbers 220, 221, 224, 266, and 274).

Laminated root rot caused by *Phellinus weirii* is present in part of the campground. Any grand firs or Douglas-firs within 50 ft of a stump or tree known to be infected with laminated root rot are assumed to be infected and have a high potential for failure at the base (e.g., grand fir Number 274, Douglas-fir Number 250). The other conifers are safe to leave within a laminated root rot pocket as long as their crowns are vigorous. Within a laminated root rot pocket, crown symptoms of fading, dieback, and stress cone crops on true fir, hemlock, or spruce indicate a compromised root system and a high potential for failure (e.g., Engelmann spruce Number 233, western hemlock Number 275). Western redcedar and larch are generally resistant to laminated root rot, while pines are tolerant. Hardwoods are immune. Butt decay may occur in older hemlocks and spruces, and failure generally occurs before mortality. A map showing the locations of the root rot pockets was prepared.

Douglas-fir dwarf mistletoe, *Arceuthobium douglasii*, causes massive witches brooms in Douglas-fir. Douglas-fir branches tend to be brittle, and the weight of large brooms makes branches highly likely to fail (e.g., Douglas-fir Number 270, Douglas-fir near the table in Site 8, and very large Douglas-fir threatening the toilet near Site 5). Larch dwarf mistletoe, *Arceuthobium laricis*, causes brooms in western larch. Larch branches are very brittle and the weight of medium-sized brooms makes branches highly likely to fail.

No recent activity by insect defoliators or bark beetles was reported.

Social System – Collaborative Stewardship

The Mt. Hood National Forest seeks to develop new and enhance relationships, understanding and trust with key recreation stakeholders that represent community of interests in and around Mt. Hood. These relationships will form the basis for forging a common vision and for finding ways to work together on projects of common interest. The goals are:

- To take care of the environment for perpetuity.
- For citizens to redeem their responsibility for the environment.
- To appropriately engage corporate America.
- To develop commonly shared vision(s) about Mt. Hood.
- To influence how we do business (day-to-day) with the American public.

In Phase I, a Recreation Stakeholder Assessment was conducted. Currently in Phase II, the focus is on building relationships with other public agencies, building internal support and capacity for expanded collaboration and partnerships, and developing effective tools to communicate with the public. All activities seek to find ways for partners with common interests to create and collaborate on projects formulated to meet their respective interests and attain shared vision.

Social System – Social & Cultural Values

The National Visitor Use Monitoring (NVUM) project, the most thorough and reliable quantitative study in the past two decades about recreation use in the Mt. Hood National Forest was conducted during 2003. All of the data related to recreation in the following sections is drawn from the NVUM unless otherwise noted.

Scope and Purpose of the National Visitor Use Monitoring Project

The National Visitor Use Monitoring (NVUM) project was implemented as a response to the need to better understand the use and importance of, and satisfaction with, national forest system recreation opportunities. This level of understanding is required by national forest plans, Executive Order 12862 (Setting Customer Service Standards), and implementation of the National Recreation Agenda. To improve public service, the agency's Strategic and Annual Performance Plans require measuring trends in user satisfaction and use levels. The project will assist Congress, Forest Service leaders, and program managers in making sound decisions that best serve the public and protect valuable natural resources by providing science based, reliable information about the type, quantity, quality and location of recreation use on public lands. The information collected is also important to external customers including state agencies and private industry. NVUM methodology and analysis is explained in detail in the research paper entitled: Forest Service National Visitor Use Monitoring Process: Research Method Documentation; English, Kocis, Zarnoch, and Arnold; Southern Research Station; May 2002 (http://www.fs.fed.us/recreation/programs/nvum).

In 1998 a group of research and forest staff were appointed to investigate and pilot a recreation sampling system that would be cost effective and provide statistical recreation use information at the forest, regional, and national level. Since that time, a permanent sampling system (NVUM) has been developed. A four-year timeframe of data collection was established for the first sampling cycle, and a five-year timeframe for succeeding cycles. The first sampling cycle was completed in September 2003. The second sampling cycle begins October 2004. This ongoing monitoring effort will provide quality recreation information needed for improving citizen centered recreation services. The Mount Hood National Forest participated in the first sampling cycle of the NVUM project from October 2002 through September 2003.

Visitor Use Estimates

Visitor use estimates are available at the national, regional, and forest level. Only forest level data is provided here. For national and regional reports visit the following web site: (http://www.fs.fed.us/recreation/programs/nvum).

Table 2-22. Annual Mt. Hood National Forest Recreation Use Estimate

Visit Type	Visits	80% Confidence Interval
Site Visits	4,981,333	15.7
National Forest Visits	4,076,119	18.6
Wilderness Visits	137,184	38.4

Recreation use on the forest for fiscal year 2003 at the 80 percent confidence level was 4,076,119 national forest visits +/- 18.6 percent. There were 4,981,333 site visits, an average of 1.27 site visits per national forest visit. Included in the site visit estimate are 137,184 Wilderness visits.

A National Forest visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A national forest visit can be composed of multiple site visits.

A site visit is defined as the entry of one person onto a national forest site or area to participate in recreation activities for an unspecified period of time.

Recreation visits can be combined with the average duration of each visit (both statistics are reported in NVUM) to yield RVD's (Recreation Visitor Days, which is defined as a visit for a period of 12 hours). Accordingly, the Mt. Hood National Forest experienced 5,706,567 RVD's overall in 2003. This statistic is well below the demand trajectory in the Land and Resource Management Plan FEIS (Final Environmental Impact Statement) which would be 9,751,000 RVD's in 2003, assuming a straight-line increase between 1990 and 2040. The RVD's actually experienced in 2003 is still well within the practical capacity of the forest for recreation (LRMP FEIS, page III-128).

Using the same analytical tool for wilderness visits based on NVUM, the Mt. Hood National Forest experienced 76,594 wilderness RVD's in 2003. This statistic is below the use cited for 1990 (166,500 RVD's). It is also well below the estimated carrying capacity for forest wilderness areas (143,930 RVD's) cited in the Land and Resource Management Plan FEIS (LRMP FEIS, page III-148). The estimate of current wilderness use on the forest is even lower when measured by wilderness permits issued at trailheads. The wilderness permit program for the Mt. Hood, Salmon-Huckleberry, and Hatfield wilderness areas, a program which have a high compliance level, indicates that approximately half the number of visitors as measured by NVUM actually visit Mt. Hood National Forest wilderness areas. There appears to be an error in the NVUM figures, therefore the National NVUM Team is investigating why there is such a dramatic difference between the two measures.

Description of Visitors

Descriptions of forest visitors were developed based upon the characteristics of interviewed visitors and expanding to the national forest visitor population. Tables 2-23 and 2-24 display the gender and age distributions for national forest visits.

Table 2-23. Gender Distribution of Mt. Hood National Forest Recreation Visitors

Male	Female
63.5	36.5

Table 2-24. Age Distribution of Mt. Hood National Forest Recreation Visitors

Age Class	Percent
Under 16	17.92
16 to 19	1.99
20 to 29	14.70
30 to 39	15.73
40 to 49	22.83
50 to 59	16.24
60 to 69	7.25
70 Plus	3.34

Visitors categorized themselves into one of seven race/ethnicity categories. Table 2-25 gives a detailed breakout by category.

Table 2-25. Race/Ethnicity of Mt. Hood National Forest Recreation Visitors

Race/Ethnicity	Percent of Visitors
White	94.2
Hispanic or Latino	2.1
Native American	0.6
African American	0.0
Asian	3.2
Pacific Islander	0.3
Other	0.5

About one percent (1.4) of forest visitors were from another country. The survey did not collect country affiliation.

Additional recently-measured quantitative information about visitor demographics was reported by Hall (*Whitewater Boating on the Upper Clackamas River*, Troy E. Hall, PhD, 2002 Survey Results – Draft, January 23, 2004). Regarding characteristics of boaters on the Upper Clackamas River, Hall reported that more than 70% of boaters were male. The mean age was about 35 years. Most boaters had earned a Bachelors degree, and 20-25% also held a graduate degree. The median income was $40,000 - $60,000. Most boaters (more than two-thirds) live within 60 miles of the river. Although first-time boaters were more likely to have traveled farther (median = 78 miles), there was no overall relationship between past experience and distance traveled.

Wilderness Visitors

Several questions on the NVUM survey form dealt directly with use of designated Wilderness. Wilderness was sampled on 42 days on the forest, and 207 interviews were obtained. There were 52.6 percent male and 47.4 percent female visitors to Wilderness on the forest. Tables 8 and 9 display the age distribution and race/ethnicity of Wilderness visitors.

Table 2-26. Age Distribution of Mt. Hood National Forest Wilderness Visitors

Age Class	Percent
Under 16	11.66
16 to 19	0.35
20 to 29	28.05
30 to 39	13.86
40 to 49	18.83
50 to 59	15.81
60 to 69	4.58
70 Plus	6.86

Table 2-27. Race/Ethnicity of Mt. Hood National Forest Wilderness visitors

Race/Ethnicity	Percent of Visitors
White	94.2
Hispanic or Latino	2.1
Native American	0.6
African American	0.0
Asian	3.2
Pacific Islander	0.3
Other	0.5

Less then one percent (.57) of those interviewed in Wilderness said they used the services of a commercial guide.

Table 2-28 gives detailed information about how the Wilderness visitors rated various aspects of the area. A general example of how to interpret this information: If the visitors had rated the importance of the adequacy of signage a 5.0 (very important) and they rated their satisfaction with the adequacy of signage a 3.0 (somewhat satisfied) then the forest might be able to increase visitor satisfaction. Perhaps twenty-nine percent of visitors said the adequacy of signage was poor. The forest could target improving this sector of visitors for increased satisfaction by improving the signage for Wilderness.

Wilderness visitors on the average rated their visit 4.0 (on a scale from 1 to 10) concerning crowding, meaning they felt there were few people there. Less than one percent said the area they visited was overcrowded (a 10 on the scale) and 18.5 percent said there was hardly anyone there (a 1 on the scale).

Table 2-28. Satisfaction of Mt. Hood National Forest Wilderness Visitors

Item	Poor	Fair	Average	Good	Very Good	Average Rating *	Mean Importance **	Nobs
Restroom Cleanliness	7.7	6.0	15.9	57.2	13.1	3.6	3.9	31
Developed Facility Condition	0.0	3.2	10.7	79.5	6.7	3.9	3.4	29
Condition of Environment	0.0	0.0	6.7	14.6	78.7	4.7	4.7	76
Employee Helpfulness	2.5	5.0	0.0	40.5	52.0	4.3	3.8	27
Interpretive Display	3.2	6.5	15.7	72.8	1.8	3.6	3.2	26
Parking Availability	1.9	1.4	4.7	56.2	35.7	4.2	3.0	71
Parking Lot Condition	0.3	2.0	24.7	43.1	29.9	4.0	2.4	70
Rec. Info. Available	9.4	10.5	9.5	52.0	18.6	3.6	3.4	60
Road Condition	0.0	2.0	18.8	68.9	10.2	3.9	3.2	61
Feeling of Safety	6.2	0.8	1.7	34.7	56.6	4.3	3.7	74
Scenery	0.0	0.0	6.1	9.6	84.3	4.8	4.7	77
Signage Adequacy	7.4	8.5	25.3	45.5	13.3	3.5	3.7	74
Trail Condition	0.0	7.9	14.8	21.5	55.8	4.3	3.9	73
Value for Fee Paid	0.7	0.4	4.6	22.6	71.7	4.6	4.1	56

*Scale is: Poor = 1 Fair = 2 Average = 3 Good = 4 Very good = 5
** Scale is: 1= not important 2= somewhat important 3=moderately important 4= important 5 = very important
Note: For items with less than 10 responses the data was not reported

Description of the Visit

A description of visitor activity during their national forest visit was developed. This basic information includes participation in various recreation activities, length of stay on the national forest and at recreation sites, visitor satisfaction with national forest facilities and services, and economic expenditures.

The average length of stay on this forest for a national forest visit was 16.8 hours. Over 25 percent (25.85%) of visitors stayed overnight on the forest.

In addition, visitors reported how much time they spent on the specific recreation site at which they were interviewed. Average time spent varied considerably by site and is displayed in Table 2-29.

Table 2-29. Site Visit Length of Stay (in hours) by Site/Type on Mt. Hood National Forest

Site/Type	Number of Hours
Site Visit Average	8.5
Developed Day Use	4.7
Developed Overnight Use	40.8
General Forest Area	11.3
Wilderness	6.7
National Forest Visit	16.8

The average recreation visitor went to 1.27 sites during their national forest visit. Forest visitors sometimes go to just one national forest site or area during their visit. For example, downhill skiers may just go the ski area and nowhere else. 88.1 percent of visitors went only to the site at which they were interviewed.

During their visit to the forest, the top five recreation activities of the visitors were relaxing, viewing wildlife, hiking/walking, viewing natural features, and driving for pleasure (see Table 13). Each visitor also picked one of these activities as their primary activity for their current recreation visit to the forest. The top primary activities were downhill skiing, relaxing, hiking/walking, other non-motorized activities, and viewing natural features (see Table 2-30).

Table 2-30. Mt. Hood National Forest Activity Participation and Primary Activity

Activity	% Participating	% as Main Activity
Developed Camping	6.71	3.12
Primitive Camping	4.61	1.64
Backpacking	4.53	0.78
Resort Use	19.71	4.41
Picnicking	11.74	0.72
Viewing Natural Features	59.93	8.51
Visiting Historic Sites	31.80	2.02
Nature Center Activities	15.92	0.03
Nature Study	5.75	0.18
Relaxing	54.36	14.69
Fishing	4.83	1.51
Hunting	0.00	0.00
OHV Use	1.04	0.17
Driving for Pleasure	30.12	3.81
Snowmobiling	0.62	0.59
Motorized Water Activities	1.12	0.01
Other Motorized Activity	0.23	0.15
Hiking / Walking	51.78	17.16
Horesback Riding	0.23	0.14
Bicycling	4.94	1.31
Non-motorized Water	5.29	1.81
Downhill Skiing	27.73	24.47
Cross-country Skiing	3.70	2.28
Other Non-motorized	17.23	9.86
Gathering Forest Products	3.37	1.04
Viewing Wildlife	43.45	1.65

Note: This column may total more than 100% because some visitors chose more than one primary activity.

Regarding whitewater boating on the upper Clackamas River, Hall reported that half of respondents had boated 15 or more times on the river, though about 20% of rafters were on their first trip (*Whitewater Boating on the Upper Clackamas River*, Troy E. Hall, PhD, 2002 Survey Results – Draft, January 23, 2004). Twenty-five percent of rafters and 20% of kayakers made their first Clackamas trip before 1990.

Twenty-five percent of boaters were alone on their river trip, while 39% came in groups of two and 21% in groups of three. Rafters tended to come in larger groups, although only about one quarter were in groups of six or more, and the largest group size was eight people.

Forty-three percent of kayakers were present just to play at Bob's Hole. All other craft users did down-river runs. Among downstream boaters, approximately two-thirds of kayakers and 53% of inflatable kayak users put in at Fish Creek, with most of the rest launching at Indian Henry. Only 14% of rafters launched at Fish Creek; the large majority put in at Indian Henry.

Eighty-three percent of boaters spent between 2 and 5 hours on the river. Most kayakers spent 2 to 4 hours, while most rafters spent 3 to 5 hours. Bob's Hole boaters spend an average of approximately 2.5 hours boating.

More than half of rafters and kayakers said they had boated in each month between February and July, indicating a relatively long recreation season. The use season seems to be longer than it was during the last survey conducted in 1994. Preferences for months to boat are based on river flows, but also on weather, considerations of crowding, and available free time.

Visitor Satisfaction Information

About one-third of visitors interviewed on the forest rated their satisfaction with the recreation facilities and services provided. Although their satisfaction ratings pertain to conditions at the specific site or area they visited, this information is not valid at the site-specific level. The survey design does not usually have enough responses for every individual site or area on the forest to draw these conclusions. Rather, the information is generalized to overall satisfaction with facilities and services on the forest as a whole.

Visitors' site-specific answers may be colored by a particular condition on a particular day at a particular site. For example, a visitor camping in a developed campground when all the forest personnel are off firefighting and the site has not been cleaned. Perhaps the garbage had not been emptied or the toilets cleaned during their stay, although the site usually receives excellent maintenance. The visitor may have been very unsatisfied with the cleanliness of restrooms.

In addition to how satisfied visitors were with facilities and services they were asked how important that particular facility or service was to the quality of their recreation experience. The importance of these elements to the visitors' recreation experience is then analyzed in relation to their satisfaction. Those elements that were extremely important to a visitor's overall recreation experience and the visitor rated as poor quality are those elements needing most attention by the forest. Those elements that were rated not important to the visitors' recreation experience need the least attention.

Tables 2-31 through 2-33 summarize visitor satisfaction with the forest facilities and services at Day Use Developed sites, Overnight Developed sites and General Forest areas. Wilderness satisfaction is reported in Table 11. To interpret this information for possible management action, one must look at both the importance and satisfaction ratings. If visitors rated an element a 1 or 2 they are telling management that particular element is not very important to the overall quality of their recreation experience. Even if the visitors rated that element as poor or fair, improving this element may not necessarily increase visitor satisfaction because the element was not that important to them. On the other hand, if visitors rated an element as a 5 or 4 they are saying this element is very important to the quality of their recreation experience. If their overall satisfaction with that element is not very good, management action here can increase visitor satisfaction.

Table 2-31. Satisfaction of Mt. Hood National Forest Recreation Visitors at Developed Day Use Sites

Item	Poor	Fair	Average	Good	Very Good	Average Rating*	Mean Importance**	N obs
Restroom cleanliness	1.8	2.9	12.4	43.6	39.3	4.2	3.9	96
Developed facility condition	0.0	0.2	11.2	38.1	50.5	4.4	4.0	97
Condition of environment	0.0	2.7	2.0	30.4	65.0	4.6	4.5	113
Employee helpfulness	1.2	1.2	4.9	26.8	65.8	4.5	4.1	91
Interpretive display	0.3	3.8	10.0	40.0	45.9	4.3	3.6	82
Parking availability	1.7	2.1	12.1	21.2	62.8	4.4	3.7	111
Parking lot condition	0.8	1.7	16.1	44.6	36.7	4.1	3.1	112
Rec. info. available	6.0	2.4	13.4	33.1	45.1	4.1	3.7	100
Road condition	1.9	1.0	7.6	40.8	48.8	4.3	3.9	101
Feeling of safety	1.6	0.1	4.8	38.6	54.8	4.4	4.1	112
Scenery	0.0	0.0	1.0	18.7	80.3	4.8	4.4	112
Signage adequacy	2.1	3.8	13.8	42.6	37.8	4.1	3.9	110
Trail condition	0.0	0.0	12.5	37.0	50.5	4.4	4.2	72
Value for fee paid	3.7	6.8	13.1	31.7	44.7	4.1	4.3	96

*Scale is: Poor = 1 Fair = 2 Average = 3 Good = 4 Very good = 5
** Scale is: 1= not important 2= somewhat important 3=moderately important 4= important 5 = very important
Note: For items with less than 10 responses the data was not reported.

Table 2-32. Satisfaction of Mt. Hood National Forest Recreation Visitors at Developed Overnight Sites

Item	Poor	Fair	Average	Good	Very Good	Average Rating*	Mean Importance**	N obs
Restroom cleanliness	10.8	0.0	25.4	20.9	42.9	3.9	3.9	31
Developed facility condition	8.4	9.3	10.7	40.6	31.0	3.8	3.8	30
Condition of environment	0.0	5.7	15.9	24.9	53.5	4.3	4.7	32
Employee helpfulness	3.1	3.1	0.0	26.7	67.1	4.5	4.2	24
Interpretive display	7.1	1.9	15.8	19.0	56.2	4.2	3.4	19
Parking availability	3.9	6.3	2.4	55.7	31.7	4.1	3.3	32
Parking lot condition	2.5	12.3	17.9	46.7	20.6	3.7	3.2	30
Rec. info. available	0.0	14.0	10.4	49.1	26.6	3.9	3.8	26
Road condition	4.0	2.1	1.1	44.8	47.9	4.3	3.8	30
Feeling of safety	0.0	0.0	10.8	27.0	62.2	4.5	4.1	31
Scenery	0.0	6.0	2.3	10.0	81.7	4.7	4.7	33
Signage adequacy	4.0	14.6	21.0	36.0	24.3	3.6	3.9	31
Trail condition	0.0	0.0	7.5	47.4	45.1	4.4	4.2	27
Value for fee paid	9.9	5.6	11.5	28.3	44.6	3.9	4.4	32

*Scale is: Poor = 1 Fair = 2 Average = 3 Good = 4 Very good = 5
** Scale is: 1= not important 2= somewhat important 3=moderately important 4= important 5 = very important
Note: For items with less than 10 responses the data was not reported.

Table 2-33. Satisfaction of Mt. Hood National Forest Recreation Visitors in General Forest Areas

Item	Poor	Fair	Average	Good	Very Good	Average Rating*	Mean Importance**	N obs
Restroom cleanliness	2.6	1.3	21.9	26.8	47.4	4.1	4.3	34
Developed facility condition	0.4	0.4	12.0	37.9	49.3	4.4	4.1	32
Condition of environment	0.0	0.5	1.5	19.3	78.7	4.8	4.8	66
Employee helpfulness	1.0	0.0	0.0	23.4	75.6	4.7	4.1	32
Interpretive display	1.7	0.9	2.6	9.7	85.2	4.8	3.2	25
Parking availability	0.3	9.4	10.8	21.4	58.0	4.3	3.5	58
Parking lot condition	0.3	9.7	19.1	27.5	43.4	4.0	2.9	54
Rec. info. available	1.8	1.2	13.8	52.3	30.9	4.1	3.9	51
Road condition	0.0	10.2	1.3	49.8	38.6	4.2	4.0	60
Feeling of safety	0.0	0.3	1.4	31.8	66.6	4.6	3.8	65
Scenery	0.0	0.0	0.2	23.8	76.0	4.8	4.5	65
Signage adequacy	0.5	10.8	10.6	50.5	27.6	3.9	4.0	63
Trail condition	0.0	9.4	0.3	43.8	46.5	4.3	4.3	50
Value for fee paid	0.0	10.4	1.8	26.5	61.3	4.4	4.3	45

*Scale is: Poor = 1 Fair = 2 Average = 3 Good = 4 Very good = 5
** Scale is: 1= not important 2= somewhat important 3=moderately important 4= important 5 = very important
Note: For items with less than 10 responses the data was not reported.

According to Hall, boaters on the Clackamas River rated the number of sanitation facilities as fair, or close to 2 on a scale ranging from poor (1) to excellent (5), and the condition of facilities as fair to good. The amount of law enforcement was also rated as between fair and good (*Whitewater Boating on the Upper Clackamas River*, Troy E. Hall, PhD, 2002 Survey Results – Draft, January 23, 2004).

Crowding

Visitors rated their perception of how crowded the recreation site or area felt to them. This information is useful when looking at the type of site the visitor was using since someone visiting a designated Wilderness may think 5 people is too many while someone visiting a developed campground may think 200 people is about right. Table 2-33 summarizes mean perception of crowding by site type on a scale of 1 to 10 where 1 means hardly anyone was there, and a 10 means the area was perceived as overcrowded.

Based on interviews with boaters on the upper Clackamas River, Hall reports that use levels have increased (since the last survey in 1994) to the point that most boaters feel at least slightly crowded, and a substantial number have altered their use of the river to cope with crowding (*Whitewater Boating on the Upper Clackamas River*, Troy E. Hall, PhD, 2002 Survey Results – Draft, January 23, 2004). The most common change (70% of those affected) has been to boat on weekdays instead of weekends. Approximately 40% have also changed the time of day or time of year that they boat. Nevertheless, few boaters believe that limits are needed at this time, and 20-40% believe us should never be limited. Fifty-four percent (kayakers) to 80% (catarafters) would accept limits "if most boaters feel too crowded."

Approximately half of the respondents to Hall's survey said waiting time at the launch did not matter to them, and nearly the same number said the percent of time they are in sight of other boaters on the river does not matter. Thus, these two conditions (commonly used as indicators of experience quality) are not relevant for many Clackamas boaters. Among those with personal standards, the acceptable wait time is about 5-10 minutes, and the maximum acceptable time in sight of others is between 50 and 70% of the time.

Table 2-34. Perception of Crowding by Mt. Hood National Forest Recreation Visitors by Site Type (percent site visits)

Crowding Rating	Developed Day Use	Overnight Use	General Forest Area	Wilderness
10 Overcrowded	0.1	0.0	0.2	0.7
9	1.0	3.7	0.2	6.5
8	3.5	19.5	1.2	1.8
7	3.8	19.5	1.0	11.5
6	15.4	13.9	2.6	7.5
5	17.8	16.8	9.3	5.6
4	13.0	3.7	8.8	16.4
3	14.9	4.6	20.4	9.9
2	16.7	8.5	15.1	21.7
1 Hardly anyone there	13.8	9.7	41.1	18.5

Clackamas River Recommendations

In 2003, the Mt. Hood National Forest prepared a written report (Guided Whitewater Boating on the Clackamas River, Woodcock, 2003) containing recommendations for the management of outfitted/guided boating on the Clackamas River. The recommendations are derived from the findings of a 1988 OSU (Oregon State University) study, a LAC (Limits of Acceptable Change) report prepared by the Mt. Hood National Forest in 2002, and the successful implementation of the 2002 allocation system.

The Forest Service researched different methods of allocating use to find a method that would satisfy guided users' needs while protecting the natural and social resources of the river. This research culminated with the development and successful implementation of the 2002 allocation system. This system required outfitter/guide companies to notify the Forest Service within three days after activities on the river. The Forest Service reviewed this information for compliance with thresholds that were established to protect resource values. None of the thresholds were exceeded in 2002.

It is recommended that commercial companies and institutions continue working together so that total combined use remains below the thresholds in the 2002 allocation system. If any of the thresholds are exceeded, the allocation system would revert back to the 2001 system, which required that all commercial businesses and institutions receive pre-trip approval by the Forest Service. The Forest Service would approve trips on a first-come, first-serve basis only as long as they complied with the thresholds.

Economic System – Built Capital

Use of Constructed Facilities and Designated Areas

One-third of the recreation visitors interviewed for the NVUM (National Visitor Use Monitoring) study in 2003 were asked about the types of constructed facilities and special designated areas they used during their visit. The five most used facilities/areas were: FS lodge, downhill ski area, forest trails, scenic byway, and forest roads. Table 2-35 provides a summary of reported facility and special area use.

Visitation and utilization data was reported by permit holders for concessionaire-managed campgrounds in 2003. Use data is not available for rustic campsites in the Fee Demo program (Northwest Forest Pass sites). The Mt. Hood National Forest Land and Resource Management Plan FEIS (Final Environmental Impact Statement) projected reaching capacity in Forest Service developed sites in 26 years. Projections of campground occupancy that were made in the early 1990's predicted that additional capacity would be needed during the first decade of the 21st century. Occupancy figures during 2003, as well as those for the past several years, suggest otherwise. In fact, occupancy in 2003 was considerably below 2002 levels. Based on current and predicted use patterns and interest, it will take longer to reach capacity in existing developed campgrounds. Like similar older recreation complexes throughout the National Forest System, the campgrounds on the Mt. Hood fill a social and economic niche that many long-time visitors to the Forest appreciate. That user group, however, is not expanding as originally projected, and may be shrinking.

Table 2-35. Percentage Use of Facilities and Specially Designated Areas on Mt. Hood National Forest

Facility	Percent
Developed Campground	10.35
Developed Swimming Site	6.09
Forest Trails	30.06
Scenic Byway	17.50
Wilderness	15.03
Museum	15.56
Picnic Area	9.77
Boat Launch	4.27
Designated OHV Area	0.05
Forest Roads	16.27
Interpretive Displays	2.14
Information Sites	2.01
Organization Camps	0.07
Developed Fishing Site	1.83
Snowmobile Area/Trails	0.43
Downhill Ski Area	34.69
Nordic Trails	4.09
FS Lodge	41.16
FS Fire Lookout	1.61
Snowplay Area	11.14
Motorized Trails	0.64
Recreation Residence	3.07

Table 2-36.

Campground Complex	No. Campers	No. Sites Occupied	Percent Occu-pancy
Hwy 26	90,032	13,117	22
Clackamas River	33,164	7,255	27
Lost Lake	Not Available	7,284	31
Olallie	16,789	3,889	40

Quantitative information about visitor demographics at Timothy Lake day-use sites was reported by Hall (*Day Use at Timothy Lake*, Dr. Troy E. Hall, 2003, January 8, 2003, FERC No. 135). Timothy Lake is a popular destination for those seeking a variety of lake and associated recreational opportunities in a forested setting. The lake offers a variety of day-use opportunities, including fishing, hiking, boating, swimming and relaxing. However, the developed day-use facilities are relatively minimally developed. They include:

- a graveled day-use parking area just north of the dam at the trailhead to the Timothy Lake Trail,
- the dam itself and nearby shoreline,
- the shoreline all along the south edge of the lake,
- a day-use area at Pine Point, which includes 9 picnic tables (four along the shore and five upslope at the parking area,
- a fishing pier,
- boat ramps in four of the campgrounds, two of which have docks, and
- six picnic tables in Hood View Campground near the boat ramp.

In part, Hall's study (which was conducted in 2001) was designed to document the amount of day use at one time, to estimate the total amount of day-use across the period of study (May through September), and to determine whether existing parking capacity is adequate to meet current demand. According to the analysis, a total of approximately 5,379 day visitors used the study area in 2001. The average length of stay for day-users ranged from about 4.5 to 5.5 hours, depending on location and month, with an overall mean of 5.22 hours. This figure is similar to the statistic for duration of visit for day-use sites cited in the NVUM report (4.7 hours). Nearly three quarters of the people counted using day-use areas were true day-users, as opposed to campers. Hall concluded that existing demand appears to be within parking capacity at most areas at Timothy Lake. Only on rare occasions did the number of vehicles exceed the available parking, and this occurred only at the Pine Point boat ramp and (rarely) at the Oak Fork boat ramp.

Use of the Forest's five alpine ski areas is variable and highly weather dependent. In general, 2002-2003 was a poor winter with a very light snow pack. Lower areas began operations much later than normal. According to the PNSAA (Pacific Northwest Ski Areas Association) annual visitation report, for the 2002-2003 season, Ski Bowl reported 83,956 visits, approximately 100,000 visits less than the previous year (a 54% decline). Summit reported 3,756 visits, which was half the use of the previous year's visitation. Timberline (238,135 visits), Mt. Hood Meadows (280,579 visits), and Cooper Spur (6,274 visits) reported 12%, 30%, and 38% declines, respectively, compared to the previous season. Overall, Oregon reported a 22% decline in downhill skiing from the previous year. Because of the anomalous conditions, it is not possible to draw any conclusions about long-term skiing trends from use during the 2002-2003 season.

Economic System – Market Goods & Services

Average Annual Outdoor Recreation Activity

Visitors participating in the NVUM (National Visitor Use Monitoring) study in 2003 were also asked about the amount of money they spent in a typical year on all outdoor recreation activities including equipment, recreation trips, memberships, and licenses. Nearly 23% said they spent less then $500 per year, and a little less than 9% said they spent over $10,000 per year (Table 2-37).

Table 2-37. Annual Recreation Spending for Visitors to the Mt. Hood National Forest

$$ Spent Each Year on Outdoor Recreation	Percent of Total
Under 500	23.41
500 - 999	22.07
1000 - 1999	16.72
2000 - 2999	13.04
3000 - 3999	4.68
4000 - 4999	5.02
5000 - 9999	6.69
Over 10000	8.36

Timber Resources

Goal

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

Providing a Sustainable and Predictable Supply of Commercial Forest Products

Current Condition - Providing a Sustainable Supply

The Mt. Hood Forest Plan identified an allowable sale quantity (ASQ) of 189 million board feet per year (MMBF). The Northwest Plan, which amended the Forest Plan, predicted a Probable Sale Quantity (PSQ) of 67 MMBF. In 1995 the PSQ level was adjusted downward to 64 MMBF to reflect the need to protect 100 acre buffer areas around spotted owl activity centers. 64 MMBF is the current PSQ for the Mt. Hood N.F.

Fiscal Year (FY) 1997 was targeted as the year when full implementation of the Northwest Plan's 64 MMBF PSQ would be met. This level of "volume offered for sale" was intended to provide the local and regional economic systems with a predictable and sustainable level of forest products.

In FY's 1996 through 1998 the Mt. Hood N.F. offered for sale a level of forest products consistent with the PSQ. In FY 1999 and 2000, litigation against the Northwest Forest Plan and the U.S. Fish and Wildlife Service required us to delay the awarding of timber sales, defer sales that we were planning to sell, and put new planning efforts on hold until issues dealing with spotted owls and survey and manage (S&M) species were resolved. Due to this, only 73% of the PSQ was sold in FY1999 and no timber sales (0% of PSQ) were offered or awarded in FY 2000.

In FY 2001 the Record of Decision which amended the Survey and Manage requirements in the Northwest Forest Plan was signed which allowed the Forest to move forward in awarding certain timber sales, offering some new sales and completing some planning efforts on timber sales that had been put on hold. Even with this, the Forest was only able to offer for sale 8.8 MMBF (14% of the PSQ) in FY 2001 due to the pending litigation and a very large number of known sites of the Malone Jumping slug within the young stands planned for thinning. Of this only 1.54 MMBF was actually awarded due to a lack of interested purchasers.

In FY 2002 the budget allocation scheduled the Forest to offer for sale approximately 27.3 MMBF (43% of PSQ). Regional litigation issues, which prevented the Forest from moving ahead which certain timber sales, were resolved. The Annual Species Review for S&M determined that protection of Malone Jumping Slug sites south of the Columbia River, were not needed to ensure the persistence of the species. The resolution of both the litigation issues and removing the Malone Jumping Slug from the S&M list allowed the Forest to offer for sale 29.5 MMBF (46% of PSQ). Of this, only 11.5 MMBF was actually awarded. This was due to a combination reasons including, no interested bidders, bidders that were determined to be non-responsible and new litigation specific to one Environmental Analysis. The timber sales with no bidders and non-responsible bidders will be re-auctioned. In FY 2002 the Forest did make progress on new NEPA planning efforts, as well as preparing timbers sales that would be offered in FY 2004.

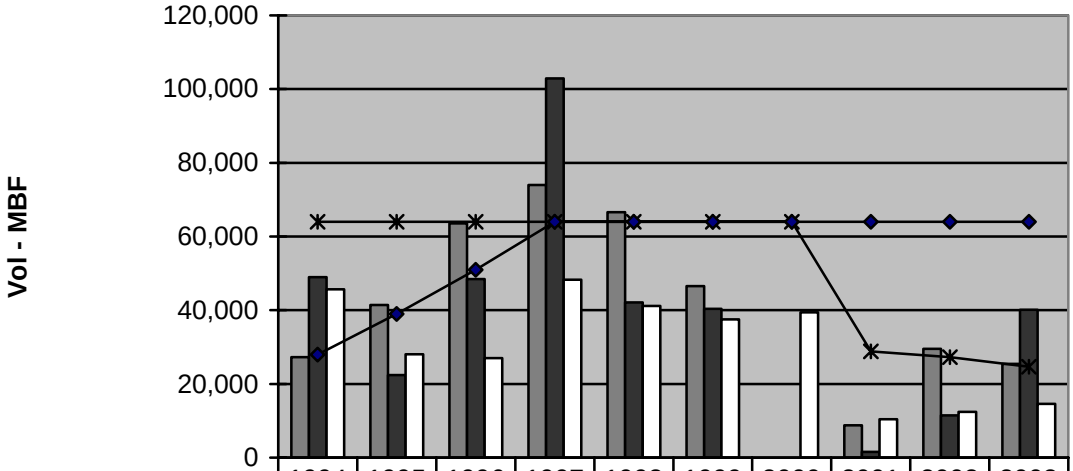
In FY 2003, the budget allocation scheduled the Forest to offer for sale approximately 24.7 MMBF (39% of PSQ). The Forest successfully offered for sale approximately 25.4 MMBF (40% of PSQ). One sale received no bidders but was re-auctioned in FY04 and has been awarded. The Forest made significant progress on one EIS and two EA's for timber sales to be offered in FY04.

Current Condition - Regional Economic System

Since the early 1990's and the listing of the spotted owl and as threatened species, harvest levels of commercial forest products from the Forest have dropped significantly. There used to be 9 to 11 local mills that bought most of the timber sales. Today, there are only 2 to 3 local mills in existence, and most of them have not recently purchased timber sales from the Forest. Potential bidders on today's timber sales, come from as far away as Springfield, Oregon to the south, Willamina, Oregon to the west, Vancouver, Washington to the north and even as far away as John Day, Oregon to the east. In addition, some of our purchasers are log buyers who do not own mills themselves. Logs harvested from one timber sale may go to 3 to 4 different mills within the region.

Most mills today are tooled to process logs between 5 and 28 inches, though there are still a few mills in the region that specialize in processing larger logs. Mills today also generally require specific species and/or log sizes based on the forest products they produce. Timber sales from the Forest have been contributing a wide variety of logs to the region in terms of both diverse species and a variety of sizes and quality. The Forest has not been providing a "predictable" supply of forest products to the region. This has contributed to less milling capacity in the region, fewer purchasers willing to buy Forest Service timber sales, and a few timber sales with no bidders. This in turn has caused timber sales from the Forest to be of less value.

Figure 2-10. Mt. Hood National Forest Volume Summary



	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Offered	27,30	41,40	63,60	74,00	66,59	46,50	0	8,800	29,50	25,40
Awarded	48,94	22,44	48,40	102,9	42,07	40,40	0	1,540	11,50	40,13
Harvested	45,64	28,08	26,96	48,26	41,14	37,47	39,40	10,40	12,40	14,57
Budget Level	64,00	64,00	64,00	64,00	64,00	64,00	64,00	28,80	27,30	24,70
PSQ	28,00	39,00	51,00	64,00	64,00	64,00	64,00	64,00	64,00	64,00

Timber Volume Sold and Harvested

	MMBF	CCF
Volume Offered	25,400	48,846
Volume Sold and Awarded	40,130	72,168
Value (Total Sold Revenue)	$3,347,238.64	$3,347,238.64
Volume Harvested	14,577	28,033

Future Expectations - Providing a Sustainable Supply of Forest Products

Sustaining a predictable supply of forest products to the regions economic system through silvicultural treatments such as thinning and regeneration harvesting is interrelated to the ecological system. Thinning operations maintain healthy forest, reduce fire hazard/fuel build up, improve wildlife habitat, and restore riparian habitat. Regeneration harvesting restores forests that have high levels of disease and/or mortality to younger healthy forest and at the same time provide forage for wildlife species dependant on early successional vegetation. These operations are also interrelated to the social system. They provide jobs at both the local and regional scales as well as reduce the demand for imported forest products.

Future budget levels for timber sale planning, preparation and administration are expected to be slightly smaller than in FY 2003. The best information we have at this time projects the Forest to plan, and sell approximately 20 to 25 MMBF per year for FY 2004 thru 2006. This level is only 30% to 35% of the PSQ. The Forest is striving to provide a "predictable" level of forest products to the regional economic systems. Nationally and Regionally the Forest Service is addressing planning issues that contribute to an unpredictable supply of forest products. Locally the Forest is addressing planning issues that affect the economic viability of timber sales, which results in sales with no interested bidders. In FY 2004 to 2006 we expect to provide a diverse mix of species, sizes and quality, though the majority will be from smaller sized trees less than 28 inches in diameter. The Mt. Hood National Forest continues to plan, prepare and administer timber sales using some of the most environmentally restrictive land management guidelines in the world. We are striving to set a global example for sustainable forest management.

Providing a Supply of Special Forest Products - Current Condition

Over the past 10 years the Forest has been able to supply moderate levels of firewood and Christmas trees to the local communities as well as the greater Portland area. The Forest has also been able to supply other special forest products for both commercial and personal use. These have included boughs for holiday wreaths, greenery for floral arrangements, mushrooms and others such as carving stock and transplants. Due to the adjacent large population and the high value products available such as noble fir boughs, the Forest has one of the largest and most efficient Special Forest Products programs in the Nation. While these products do not contribute relatively large dollar value to the regional economic system, they do provide for a considerable amount of employment for local workers. In addition, the gathering of firewood, Christmas trees, huckleberries and mushrooms for personal use, is considered by many to be a recreational opportunity, which does provide regional economic benefits and is interrelated with the local and traditional social values.

Table 2-38. Special Forest Products Sold and Harvested

Number of Firewood Permits Sold	2,016
Value	$49,110.00
# of Christmas Trees Harvested	5,878
Value	$29,747.00
# of Bough Permits	36
Value	$106,959.42
# of Beargrass Permits	746
Value	$20,970.00

Future Expectations - Providing a Sustainable Supply of Special Forest Products

Future budget levels for the Special Forest Product programs are expected to be similar to FY 2003. Demand for these products, which provide recreational opportunities, are expected to increase as the nearby population grows. However the supply of firewood-harvesting opportunities are decreasing due to fewer commercial timber sales. Commercial timber sales have generated most of the firewood harvested. The Forest is attempting to increase firewood availability through roadside harvesting of dead and down material. The Forest is looking for ways to continue to provide firewood.

Christmas trees and bough harvesting opportunities are expected to be limited in the future due to less regeneration harvesting. In other words, the trees planted in the clearcuts 10 to 20 years ago are getting too big to be cut for Christmas trees or produce high quality boughs.

The Forest expects to continue looking for opportunities to supply special forest products as the demand rises. Recent indicators suggest that harvesting of plants for bioresearch may expand in the near future. However, our ability to provide these opportunities is dependent on budget allocations, which directly relates to the number of employees assigned to this task.

Silvicultural Treatments

Affect on Landscape Structure and Vegetative Composition

Timber Harvest

Timber harvest occurred on only a very small portion of the landscape. Harvest occurred on 1,029 acres, which equals less than 1/100th of a percent of the total acreage of the Mt. Hood. The majority of the harvest occurred on lands designated as Matrix in the Northwest Forest Plan, with approximately 10% thinning in the Riparian Reserves. Approximately 13% of the harvest occurred as commercial thinning in Administratively Withdrawn lands, in the unroaded recreation land allocation. No harvest occurred in Late Successional Reserves (LSR). The Matrix land allocation is where most scheduled timber harvest (that contributing to probable sale quantity) occurs. Less than .5% of matrix acres were harvested in 2003.

Within the matrix allocation of the Northwest Forest Plan, the underlying management areas of the Mt. Hood Land and Resource Management Plan provide direction. Part of our monitoring effort is to monitor the amount of acres harvested within each of the management areas to help determine if objectives are being met, to monitor the actual rate of harvest, and to test original model assumptions for timber yields during plan revisions. As displayed in the following tables, the bulk of the 2003 harvest occurred in C1 timber emphasis, with the remaining in B2 scenic viewshed, A5 unroaded recreation, and B11 deer & elk summer range. Harvesting continues to occur at a rate below the annual probable sale quantity.

See Table 2-40 for definitions of A, B, C & D land allocations.

Table 2-39. 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
00	2	29	69	0
01	1	28	71	0
02	0	60	40	0
03	13	37	50	0

* Data not available for FY94.

Table 2-40. Acres Harvested by Forest Plan Management Area in FY92-FY2003*

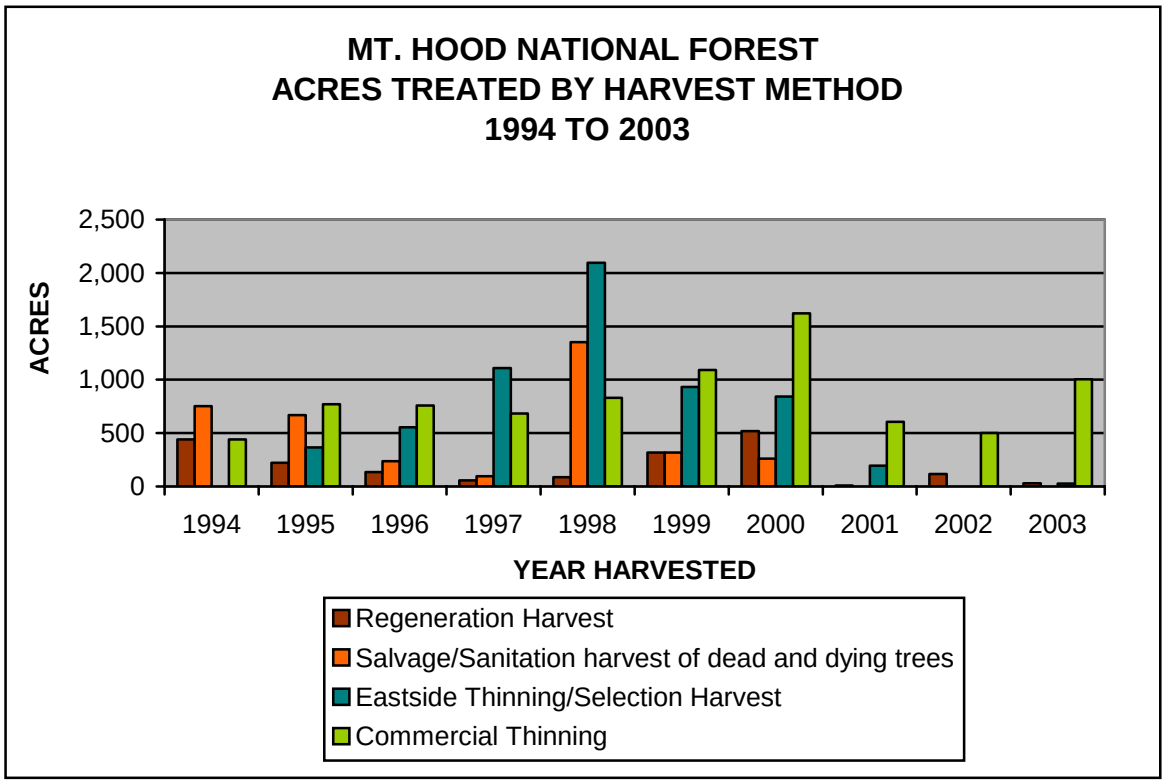
Management Area		Acres Harvested by FY										
		92	93	95	96	97	98	99	00	01	02	03
A4	Special Interest Area	6			14	13	372		19			
A5	Unroaded Recreation		14	12								149
A6	Semi-primitive Roaded Recreation	3	5									
A7	Special Old Growth						95					
A9	Key Site Riparian	7				75			15	11		
A10	Developed Recreation						14					
A11	Winter Recreation Area			9								
A12	Outdoor Education Area		3									
A13	Bald Eagle Habitat								39			
B1	Designated WS&R Rivers		6	30	20	11						
B2	Scenic Viewshed	1,167	689	644	597	197	876	206	80	70	182	280
B3	Roaded Recreation		15	4					1			
B4	Pine Oak Habitat Area	179	288		98	268	366	282	62			
B6	Special Emphasis Watershed	465	470	306	70	62	169	191	64		95	
B8	Earthflow Area	57	104	125	347	119	191	106	238	74	23	
B9	Wildlife/Visual Area	28	63		26	136						
B10	Winter Range	182	34	153	3		156	112	163			
B11	Deer and Elk Summer Range	11	28				23		352	79	74	91
B12	Back Country Lakes					3						
C1	Timber Emphasis Area	2,723	1,896	744	510	1,064	2,104	1,762	2,257	574	246	509
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	3,299	808	620	1029

* Data not available for FY94.

Harvest Methods

Types of harvest methods that were implemented during FY 03 are displayed in the following graph.

Figure 2-11. Acres Treated by Harvest Method



Year Harvested	Regeneration Havest	Salvage/Sanitation Harvest	Eastside Thinning – Selection Harvest	Commercial Thinning
1994	442	753	0	442
1995	223	669	365	770
1996	135	236	556	758
1997	58	97	1,110	683
1998	87	1,353	2,095	829
1999	319	319	931	1,090
2000	519	261	843	1,622
2001	8	0	194	606
2002	118	0	0	502
2003	30	0	26	1,003
Total	**1,939 (9.6%)**	**3,688 (18.4%)**	**6,120 (30.5%)**	**8,305 (41.5%)**

In 2003, commercial thinning accounted for 95% of the acres treated, shelterwood harvest 3%, and group selection harvest accounted for the remaining 2%. In the last decade there has been an overriding shift from regeneration harvest to commercial thinning. The graph also displays how harvest methods used reflect on the ground conditions and objectives over the last ten years. For example, more salvage harvest occurred in the late '90's. At this period in time there was an increase in Douglas-fir bark beetle caused mortality that occurred after several wind events. There was also an emphasis on treating stands on the eastside of the forest to lessen the susceptibility to forest insects and to treat disease. Commercial thinning has increased within the last few years on the west side of the forest as stands that were regenerated 30 years ago, have grown to plantations of commercial size.

Thinning is a cultural treatment made to reduce stand density of trees primarily to improve growth, enhance forest health, or recover potential mortality. Commercial thinning is done when the diameter of the trees reaches a merchantable size, 7 inches or larger. The stands are thinned from below which removes trees from the lower crown classes to favor those in the upper crown classes. By this approach the tallest, largest, and fastest growing trees are left to meet desired objectives.

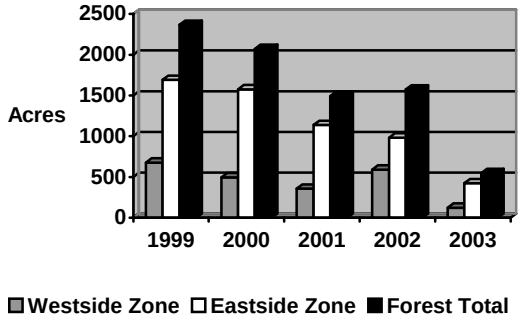
Shelterwood harvest is a type of regeneration method in which a new age class is created. By definition, a shelterwood is the cutting of most trees, leaving those needed to produce sufficient shade to produce a new age class in a moderated environment. Typically this method is used on the harsher sites of the forest along the Cascade Crest or on the drier sites on the east side of the forest. A shelterwood with reserves is the terminology used when some or all of the shelter trees are retained after regeneration has become established to attain goals other than regeneration. This is the case on the Mt. Hood N.F. in which the overstory shelter trees are retained indefinitely to meet the green tree retention standards of the NW Forest Plan or to meet other objectives such as visual quality.

Group selection is another type of regeneration method in which trees are removed and new age classes are established in small groups. This approach is often used in areas that have root disease and a change in host species is needed to reduce the effects and spread of the disease. It is also often used when regeneration of shade intolerant species is needed.

Reforestation - Maintenance of Ecosystem Components

Reforestation practices are monitored to ensure that areas harvested are adequately restocked within five years of a final harvest (36 CFR 219.27). Reforestation practices are also monitored to ensure appropriate species and genetic diversity.

Figure 2-12. Reforestation Accomplishments



The forest accomplished 548 acres of reforestation in FY03. As displayed in the previous figure, reforestation continues on a downward trend which is directly related to the decreased level of regeneration harvests and the decreased level of timber harvest overall. The graph also displays the reforestation accomplishment from 1999 to 2003 for both the Westside Vegetation Zone (Clackamas River and Zigzag Ranger Districts) and the Eastside Vegetation Zone (Barlow and Hood River Ranger Districts). To an extent this reflects harvest levels, however some reforestation units on the eastside require a second inter-planting in addition to the initial planting, which is included in the accomplishment.

A diversity of species was planted with additional species diversity expected from natural regeneration of shade tolerant species such as Western hemlock. Species diversity increases resilience to host specific insects and disease, and other damaging agents within the stand. Six conifer species were planted: Douglas-fir, ponderosa pine, lodgepole pine, western white pine, noble fir, and western larch. All of the acres planted were with seedlings from known seed sources and genetically diverse seed lots. 92% of the acres planted were with seedlings whose origin comes from select trees with good phenotypic growth characteristics and better than average growth rates. The western white pine planted was from stock that is resistant to white pine blister rust, thus enabling restoration of this species.

As compared to FY02, overall survival improved in FY03. First year survival rate, all species combined, was 83%, slightly above the 80% standard for survival. First year survival by species is as follows: Douglas-fir 86%, lodgepole pine 68%, Western white pine 98%, ponderosa pine 58%, noble fir 94%, and western larch 80%. With the exception of ponderosa pine, all of these survival rates are good to very good for the respective species. Third year survival rate was also very good at 80% for all species combined. This is one of the highest average third year survival rates for the forest since 1987. Stock quality and good soil conditions contributed to the high survival percentage. On the eastside, mortality continues to be mostly related to pocket gopher activity. With the constant trapping and baiting program, difficult units are slowly becoming established.

Even though third year survival rate was high, units that were determined satisfactorily stocked at the time of the third year exam was 40%. These are acres that were planted 3 years ago and include replanted acres. These acres also include in-growth from natural regeneration, but also reflect mortality from gophers or other causes. With continuing in-growth from natural regeneration, the 5 year regeneration requirement should be met on all units, although some of the sites will need continuing pocket gopher control or additional inter-planting. 156 acres met prescribed stocking objectives with only one treatment and were certified this year.

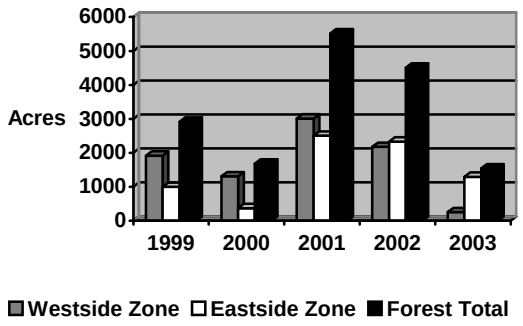
Cone collection in 2003 consisted of 35 bushels of noble fir cones from the Southfork Seed Orchard and 12 bushels of whitebark pine cones from the Mt. Hood

Meadows and Cloud Cap areas. Although there is an adequate supply of noble fir seed on inventory, the seed lots are from older collections and germination has been steadily decreasing. The noble fir cones from the Southfork Seed Orchard will contribute to a supply of well-adapted, genetically diverse seed with a moderate level of genetic improvement.

A 2003 survey of whitebark pine showed significant decline in populations due to blister rust, which is an introduced disease, and bark beetles. There was also an abundant cone crop, so 11 bushels of whitebark pine cones were collected. Cones from this collection will be used for whitebark pine conservation and restoration programs, and potentially for disease resistance breeding programs.

Stand Improvement Activities – Maintenance of Ecosystem Components

Figure 2-13. Stand Improvement Activities



In FY03, the forest accomplished 1,496 acres of pre-commercial thinning (PCT) and 50 acres of pruning for blister rust prevention in western white pine. Appropriated funding for pre-commercial thinning in Region 6 dropped dramatically in FY03 due to national funding strategies and increased reforestation needs from large scale fires in the northwest. 911 acres of PCT was funded through appropriated sources (NFVW) and 139 acres through Knutsen-Vandeberg (CWKV) funding associated with timber sales. Because of this decline in appropriated dollars, other sources of funding will be necessary in the future to maintain a productive pre-commercial thinning program. In FY03 446 acres of PCT was funded through the Payments to the Counties program on the Hood River and Barlow district. Still there is a backlog of at least 13,000 acres of young stand thinning. Fertilization funded by appropriated dollars is lower priority than thinning, and 8,500 acres are identified for treatment, but unlikely to be funded.

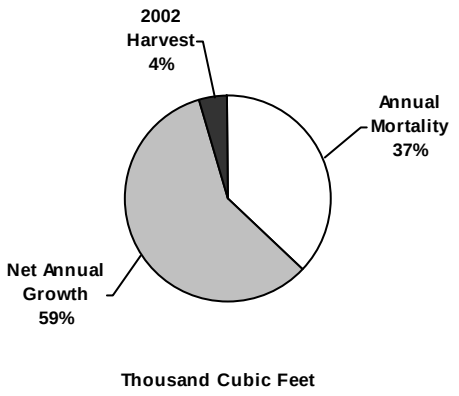
Pre-commercial thinning can greatly influence the future trajectory of the stand both in terms of species composition, and horizontal and vertical arrangement. Prescriptions generally call for retention of minor species and a 25% variance in spacing. This allows for greater species and structural complexity in the stand.

Ecosytem Function - Forest Productivity

The R6 Current Vegetation Survey, along with forest GIS layers of land allocations, can be used to estimate the current standing inventory of the Mt. Hood National Forest and annual rates of growth and mortality. Tree growth rates can be used as estimates of productive capacity. Productivity includes storing energy from the sun, via photosynthesis, in carbon based biomass, and also includes secondary productivity via respiration. Tree mortality contributes to nutrient cycling and decomposition of organic matter. Some mortality can be viewed as a loss of economic product and industrial based approaches to forestry attempt to capture potential loss of mortality via commercial thinning. The following pie chart displays the net annual growth, annual mortality and harvest for 2002. This chart was not updated for 2003, but percentages are relatively similar.

Overall annual growth is more than 13 times that of harvest and yearly mortality exceeds harvest by a factor of 8 to 1. On matrix lands only (outside of Riparian Reserves), growth is almost 3.7 times the rate of harvest. This indicates that timber harvest, by removing trees from the forest, is having a very small effect on net productivity. However, the lack of harvest may be contributing to increased mortality resulting in both positive and negative ecological benefits. It is recommended to explore this relationship and trend further in the next monitoring report and to also explore the increasing mortality from insects and disease. In general, tree growth exceeds harvest rates in Oregon by a wide margin, so it is also recommended to compare the growth, harvest and mortality rates of the Mt. Hood to the statewide percentages.

Figure 2-14. Growth, Mortality and Harvest, Mt. Hood National Forest

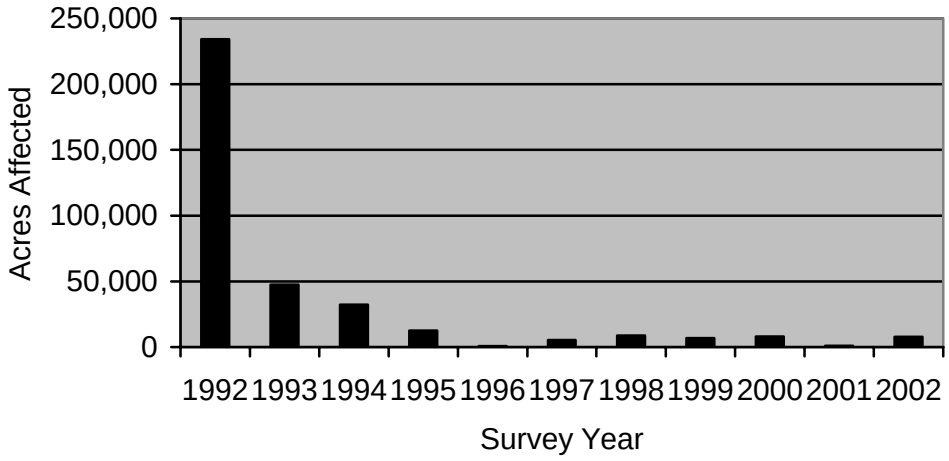


Disturbance from Forest Insects and Diseases

Disturbances, either of natural or human origin, impact all aspects of ecosystems at a landscape level, including habitat stages, successional stages, structural differentiation, nutrient cycles, forage availability, water quality/quantity yields, successional pathways, wildlife variety and quantity, carbon balances, scenic variability, availability of products, and economic values of products. Disturbance from fire, timber harvest, and geologic events, such as debris flows, are addressed in other sections of this report. This section focuses primarily on disturbance related to forest insects and diseases mapped during the Annual Aerial Detection Survey conducted by Forest Health Protection.

Based on the Annual Aerial Detection Survey, insects are causing defoliation on approximately 5,400 acres of the forest resulting in reduced growth rates and lowered resistance to climatic factors, other insects, and/or diseases. The majority of the defoliation was caused by larch casebearer and, to a lesser extent, needleminers on true fir. Of greater significance is the increase in beetle-caused tree mortality. Recent bark beetle activity, caused by mountain pine beetle and fir engraver, was detected on 18,000 acres and an estimated 31,000 trees have been killed. This level of mortality is similar to that of 2002 and is the highest of the last decade.

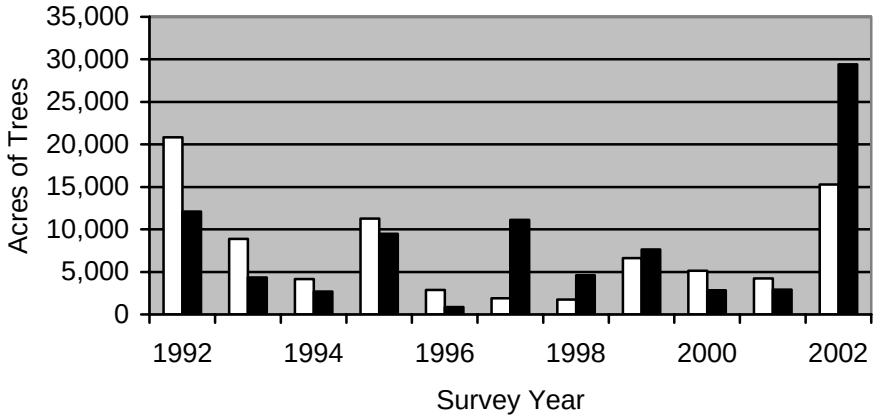
Figure 2-15. Acres Affected by Defoliating Insects or Diseases



The predominant defoliating agents mapped were larch casebearer on larch; 2,643 acres of activity was mapped on the eastside of the forest, north of Fifteenmile Campground. Minor acreages of needleminers in true fir near the Timothy Lake area, western spruce budworm and white pine blister were also mapped. Although western spruce budworm was mapped on 602 acres, it has not been confirmed on the ground.

Larch casebearer activity has increased since 2002, although timing of the aerial survey can affect visibility of defoliation. Western larch has the ability to produce a second flush of needles after the spring defoliation and this can mask the visible signature of the yellowed needles. Consecutive years of defoliation by this non-native insect can cause growth reduction, but whole tree mortality is uncommon. Because larch is a deciduous conifer, the effects of repeated defoliation are not as severe as they would be on non-deciduous conifers (e.g., the effects of repeated defoliation by western spruce budworm on Douglas-fir or grand fir.)

Figure 2-16. Acres Affected and Trees Killed on Federal Lands Within the Mt. Hood Reporting Area



Levels of insect-caused tree mortality are similar to 2002 and are at the highest levels of the past decade. The ability to differentiate, from the air, the signatures of the red needles of dying true firs and dying lodgepole pines, when together in a mixed species stand is difficult. It can be done with a fair level of accuracy if the aerial survey is combined with some ground checks. It appears that the surveyors were biasing their labeling of dead trees toward lodgepole pine in 2002 and toward true fir in 2003. We know that there were significant amounts of lodgepole pine mortality mixed in with true fir mortality in some areas in 2003, but the mortality was coded primarily as fir engraver in true fir. So, when looking at trends of beetle-caused mortality over the last several years, it is probably best to combine all mortality caused by these two beetle species. Keep that in mind when reading the mortality trends for these two beetles as presented in the following paragraphs.

True fir mortality, was mapped on 15,000 acres with a total of almost 27,000 trees killed. Only 563 dead trees over 714 acres were mapped in 2002, and about half that in 2001. The next highest years, compared to 2003, were 1970 and 1995 with approximately 8,000 trees killed each of those years. The mortality is scattered throughout the eastside of the forest, both scattered individuals of <1 to 8 trees per acre, and small pockets of 20-50 trees per acre. There undoubtedly was an increase in true fir mortality in 2003, although, as noted in the previous paragraph, it may not be quite as large as the data suggest. This increase in mortality is probably associated with moisture stress.

Mountain pine beetle continued to cause mortality in 2003, however, the estimate of 3,855 dead trees, mainly lodgepole pine, seems to be low. The numbers of mountain pine beetle caused mortality increased from a little under 2,000 in 2001 to approximately 27,000 over 11,000 acres in 2002. From observations on the ground, is does not seem reasonable that the numbers would fluctuate this dramatically, from low in 2001, to high in 2002, back down in 2003, and then back up in 2004 (based on ground observations). Most of the mountain pine beetle mortality on the Mt. Hood National Forest mapped in the vicinities of Olallie Lakes Resort, SiSi

Butte and Potato Butte. The mapped polygons varied from patches with 5 dead trees per acre to pockets of 30 dead trees. There is extensive lodgepole pine mortality on Warm Springs Indian Reservation east of Olallie Lakes and farther south near Breitenbush Lake and east of Mt. Jefferson. Stressed, low vigor trees are susceptible to mountain pine beetle. Densely stocked older stands are highly susceptible to beetle infestation. Overstocked stands with very low levels of mortality, such as those in the Summit Lake and Lemiti areas, could be considered for density control to decrease the probability of further mountain pine beetle attack.

Balsam woolly adelgid is a non-native species that has become widely established in North America where it is highly destructive to Pacific silver fir, subalpine fir, and grand fir. The 2003 aerial sketch map survey noted 16,020 acres of adelgid activity on the forest, the most since 1973 (21,000 acres). Balsam woolly adelgid causes branch mortality, top kill, and whole tree mortality. Although present on 16,020 acres, the visible signature of the trees in response to this insect to not allow estimation of the actual numbers of trees killed each year.

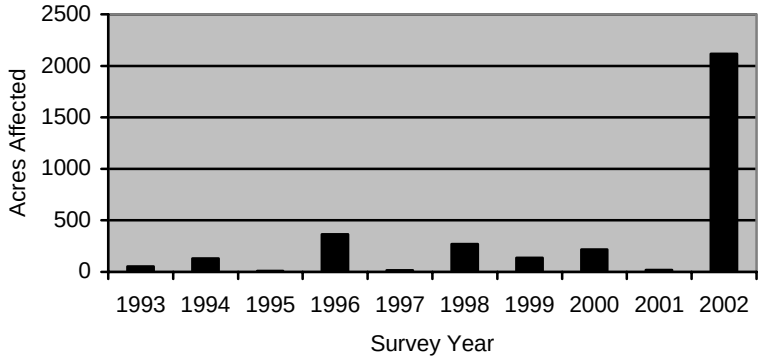
Although small, the amount of ponderosa pine mortality caused by mountain pine beetle doubled from last year to 488 trees. This mortality occurred in pockets of 5 to 100 trees on the far eastside of the forest. Mortality in ponderosa pine also occurred east of Olallie Lakes on Warm Springs Indian Reservation.

A small amount of whitebark pine mortality was also attributed to the mountain pine beetle.

Mortality from the Douglas-fir beetle is at low levels. A total of 367 trees were killed over 794 acres, about a fifth as many trees as were detected in 2002.

White pine blister rust effects were observed on 51 acres. This non-native disease will continue to have an effect on five needle pines. Surveys were completed for whitebark pine populations in 2003 which showed significant amounts of whitebark pine mortality caused by blister rust infections. A report on the survey results will be completed in 2004.

Figure 2-17. Acres Affected by Agents Other than Mortality or Defoliating Classified Insects and Diseases



The aerial sketchmap survey also noted similar levels of bear activity as last year, in the vicinity of Walker Prairie, Larch Mountain, Bull Run River, north of Brightwood, Eagle Creek, along the Clackamas River and throughout the west side of the forest. This is likely due to increased bear populations.

Campground Vegetative Surveys

Vegetative surveys of each of the campgrounds on the Mt. Hood National Forest are being conducted to identify existing hazard trees and to provide information for long term management of the sites. In 2003, Vegetative Surveys of the following campgrounds was completed: Green Canyon, Eight Mile Crossing, Lower Crossing, Knebal Springs, and Fifteen Mile. In general, the common root diseases and stem decays associated with Pacific Northwest forests have been located in varied amounts in most of the campgrounds surveyed. Root diseases include: *Phellinus weirri*, *Hetereobasidion annosum*, and *Armallaria ostoyae*. The most common stem decays include: *Phaeolus schweinitzii*, *Phellinus pini*, and *Echinodontium tinctorium.*

Recommendations

- The outyear timber program should continue planning efforts to provide a predictable supply of commercial forest products and to meet desired land management objectives. This includes emphasizing eastside stands that could benefit from silvicultural treatment for insect and disease concerns, thinning of stands in Late Succesional Reserves to accelerate development of late successional structure, and thinning commercial size plantations on the west side.

- Continue to use a variety of harvest methods and silvicultural systems to meet objectives.

- Assess areas on the eastside where stand conditions have changed over time due to fire suppression. Pursue planning of silvicultural and fuels treatments to reduce hazardous fuels, modify wildland fire behavior, and restore ecological conditions.

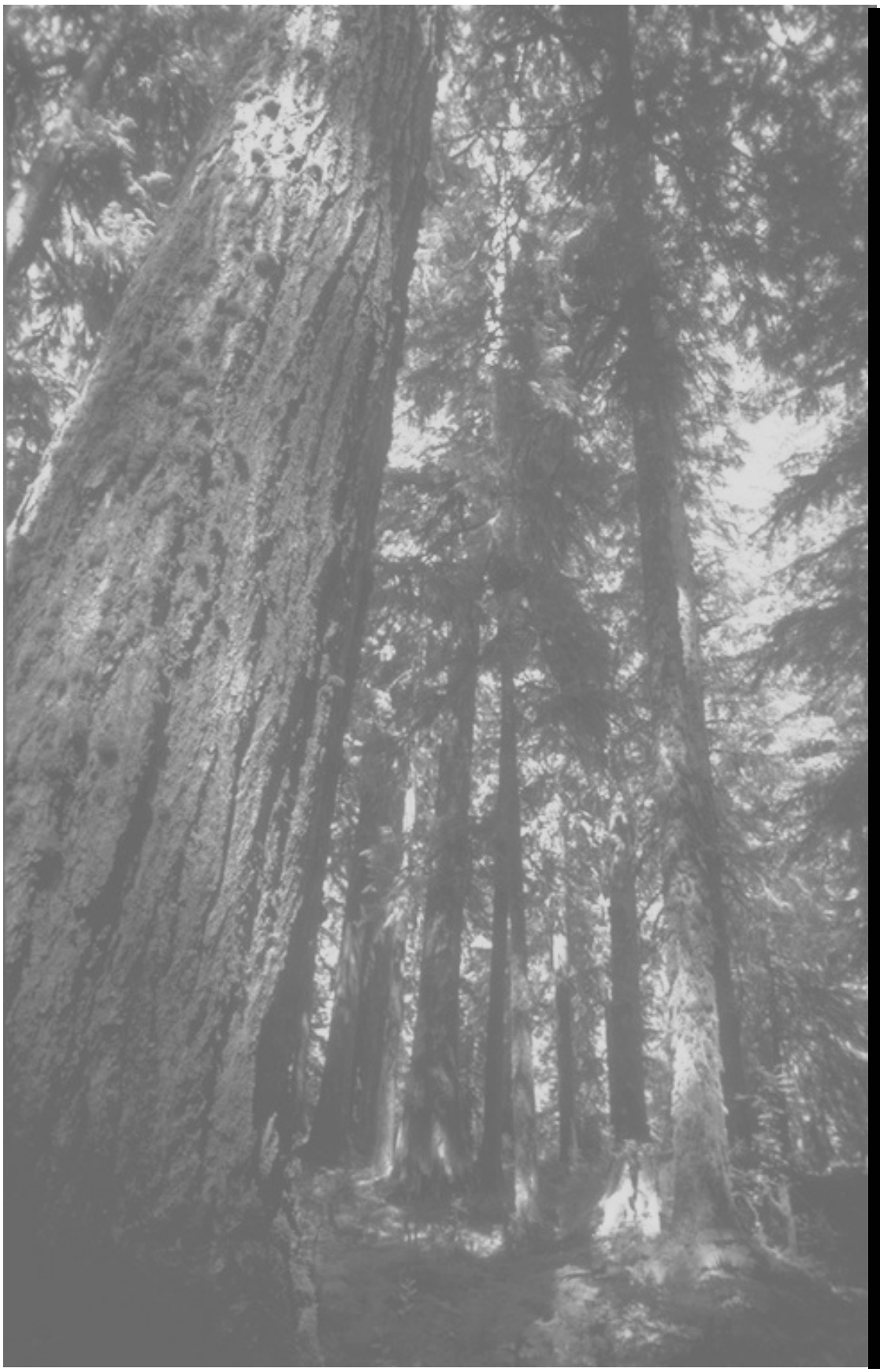
- Pursue small sales, roadside salvage, or designate firewood cutting in areas of mortality from fir engraver and mountain pine beetle.

- Reduce stocking of lodgepole pine and ponderosa pine stands imminently susceptible to bark beetles. Pursue thinning of young stands to maintain vigor and prevent future bark beetle infestations.

- Continue to pursue a mix of funding sources to accomplish the back-log of pre-commercial thinning since appropriated funding region-wide will continue to be prioritized for post fire reforestation.

- Complete a comprehensive report on whitebark pine and develop a conservation and restoration plan.

- Use the Campground Vegetative Surveys to develop long term vegetation management plans for the campgrounds.



Chapter 3

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 2003 (October 1, 2002 to September 30, 2003). 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 2003 was $17,973,000. Multiple combinations of funding categories have occurred during the last few years, which makes tracking specific program areas difficult. However, general trends in major resource areas are evident. Because budget allocations may vary considerably, predicting long term sustainability in any one area is difficult to do. The following table 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 3-1 and 3-2 show a significant change as related to the total forest budget and workforce (Full Time Equivalent = FTE) since 1990.

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. 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.

Table 3-1: Budget Levels Predicted/Actual (Partial List)

Activities	*Forest Plan Predicted (thousands/yr) 1990	** Actual Expenditures (thousands)								
		FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03
Fire										
Brush Disposal	3,056	995	758	632	426	547	346	402	228	256
Fire Fighting Fund	2,118	1,119	2,145	2,520	2,187	2,173	2,227	2,535	2,949	2,040
Engineering										
Timber Roads	2,709	244	292	518	586	1,015	930			
Facilities Maintenance	478	271	222	230	264	375	357			
Recreation Roads	1,381	103	53	103	104					
General Purpose Roads	118	575	56	151	16					
Recreation Facilities	1,751	424	293	499	599	152	419			
Trail Construction	1,279	606	253	534	346	383	174	698	484	424
Road Maintenance	4,079	1,874	1,030	1,139	965	943	747	2,270	1,795	2,613
Rec & Eng. Facilities								1,042	1,201	1,828
Timber										
Salvage Sale Funds									737	752
KV Funds		5,918	6,647	4,696	2,501	2,950	4,346	3,827	1,268	553
Forestland Vegetation								1,241	709	756
Genetic Tree Improvement	9,602	4,362	4,566	4,126	2,925	2,890	1,820			
Reforestation										
Timber Stand Improvement	2,792	2,610	1,969	2,331	1,855	1,481	1,170			
Timber Sale Management	5,270	1,222	2,279	2,465	3,798	2,909	2,210	2,071	3,660	1,250
Sale Administration										
Sale Preparation										
Silvicultural Exams										
Administration										
General Administration		3,318	2,114	489	1,276	1,479	1,095	898		
Recreation/Lands										
Land Acquisition	50	521	7	128	23	8	0			
Cultural Resources	459	70	55	78	90	83	59			
Land Line Location	10	0	0	0			0			
Recreation	5,924	2,036	2,045	1,692	2,021	1,640	1,983	1,865	2,111	1,508
Fish/Wildlife/Range/Soil/Water										
Fish-Anadramous	986	768	644	491	557	584	667	1,412		
Fish-Inland	365	130	76	92	141	161	110			
Wildlife 809	202	224	256		302	237				
Threatened, Endangered Species	642	242	224	154		188	155			
Range Betterment	4	3	4	1		1		1	1	
Soil Inventory	112	152	60	30		128	69	120		
Range Vegetation Management	73	14	11	18	23	27	31			
Soil/Water Administration	1,726	534	266	289	296	271	108			
Ecosystem Management		1,671	1,806	999	888	439	846	1,242	1,077	746
Fish/Wildlife/Soil/Water									1,657	1,381

* 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 18 million.

Recommendations

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

Figure 3-1. Mt. Hood National Forest Budget Trends

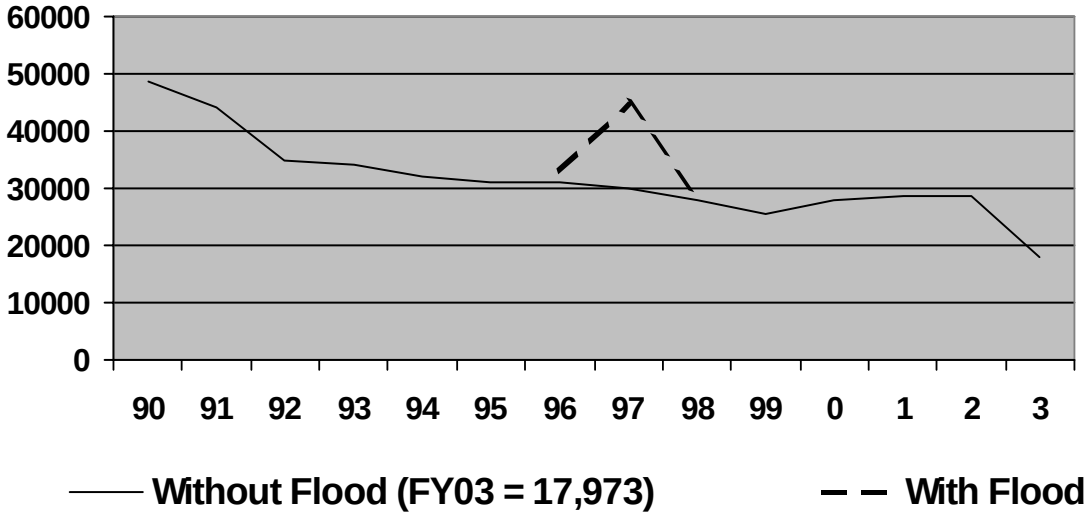
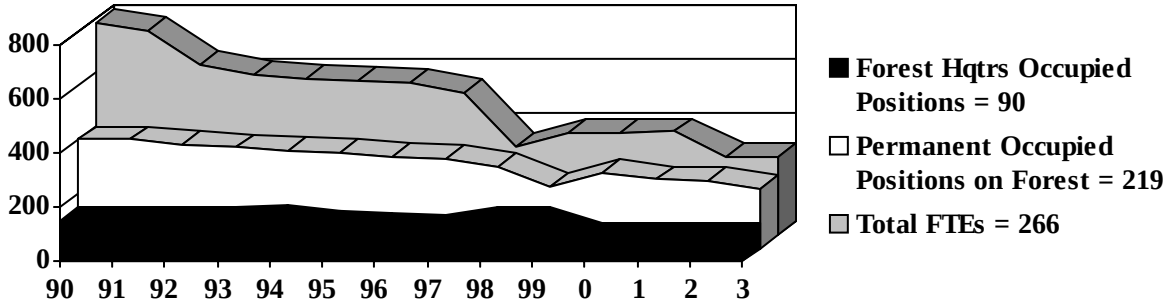


Figure 3-2. Mt. Hood National Forest FTE/Position Usage



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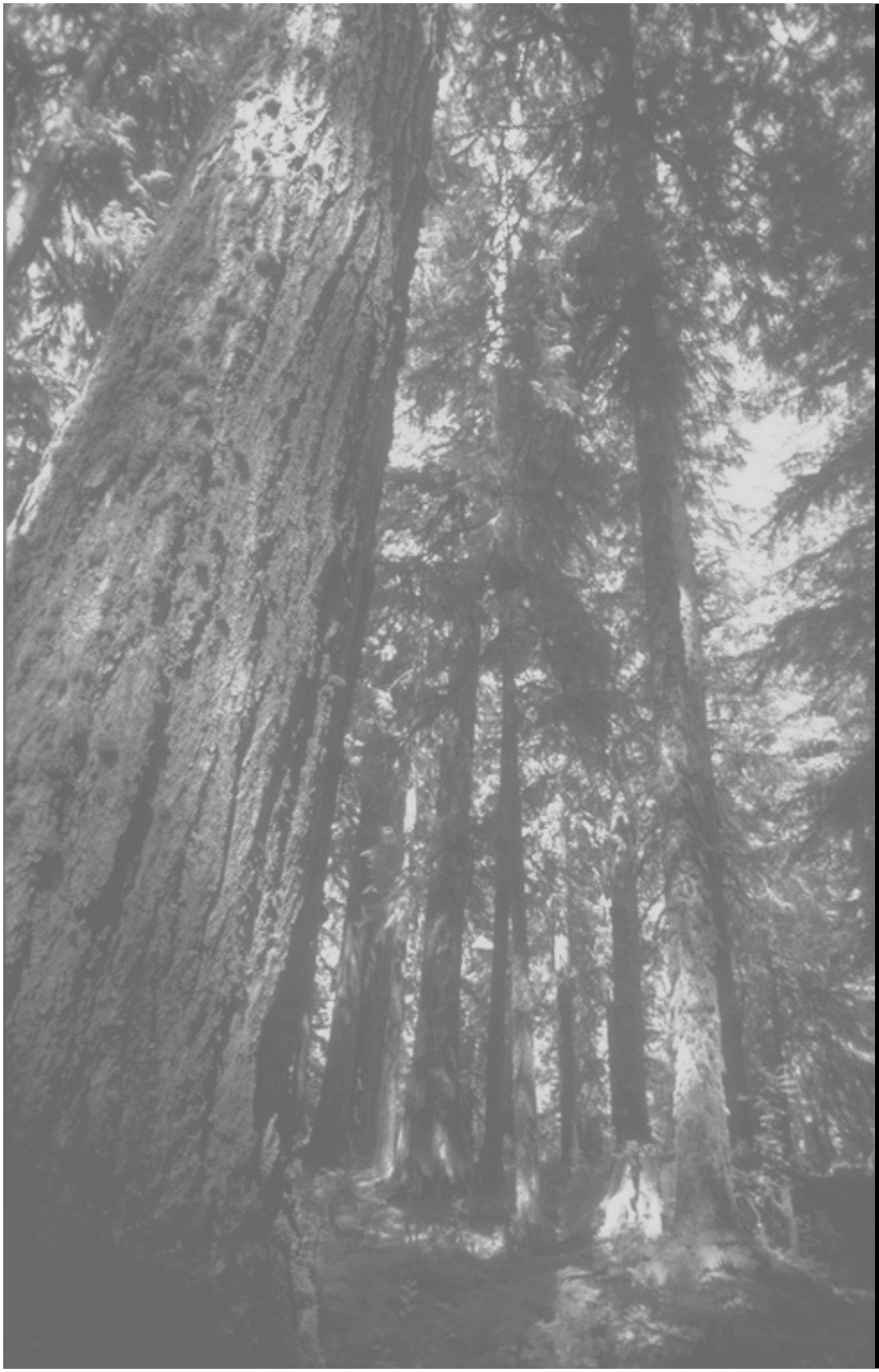

Chapter 4

Chapter 4

Forest Plan Amendments/ Interpretation Process

As we continue to implement the Forest Plan as amended by the Northwest Forest 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 various monitoring programs will continue to be evaluated. The need to change the Mt. Hood Land and Resource Management 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, 2003, twelve amendments have been made to the Forest Plan. A thirteenth amendment had been proposed, but the implementing decision was recalled during the appeal process and has not yet been reissued. Five reflect changes made during Wild and Scenic River planning, one concerned noxious weed management, one adjusted a Research Natural Area Boundary, one responded to Elk Habitat Enhancement needs, one dealt 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 expanded Mt. Hood Meadows ski area permit boundary, one Congressional Act modified activities within the Bull Run watershed, and one that designated Timberline Lodge and its immediate environs (approximately 5 acres) as a Historical Special Interest Area – A-4. Number thirteen would have modified Standards, Guidelines and Management actions related to the use and management of the Mt. Hood, Salmon-Huckleberry, and Hatfield Wildernesses.

The thirteen amendments are:

1. *Big Bend Mountain Research Natural Area* boundary change (within the Bull Run Watershed). 10/3/91

2. *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

3. *Salmon Wild and Scenic River EA and Management Plan* – delineates final river boundary and eliminates "regulated" timber harvest within the corridor. 3/10/93

4. *Lemiti Elk Habitat Enhancement Project* – exchanges an existing Roaded Recreational Management Area at Lemiti Creek with an adjacent Deer and Elk Summer Range Management Area. 5/17/93

5. *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

6. *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

7. *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

8. *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

9. *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

10. *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

11. *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.

12. *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

13. This amendment made revisions to the *Wilderness Recreation Spectrum allocations and Forest Plan standards* dealing with "Limits" as related to Limits of Acceptable Change process. Standards relating to visitor use, restoration of impacted sites and public involvement were adjusted. Some standards were tightened and some were modified to be more realistically achievable. 12/11/2000

    Note: This decision was recalled based on information identified during the appeal process. A new decision has not yet been issued and the amendment has not been implemented.

Monitoring has disclosed significant disparity between our amended 1994 Forest Plan projections and existing Forest conditions that would currently warrant a revision at this time. We will continue to make nonsignificant amendments to our Forest Plan as needed as we look forward to a full Forest Plan revision. The Mt. Hood National Forest is currently scheduled to begin a Forest Plan revision in 2008 with preparation of a Draft Environmental Impact Statement due in 2011.

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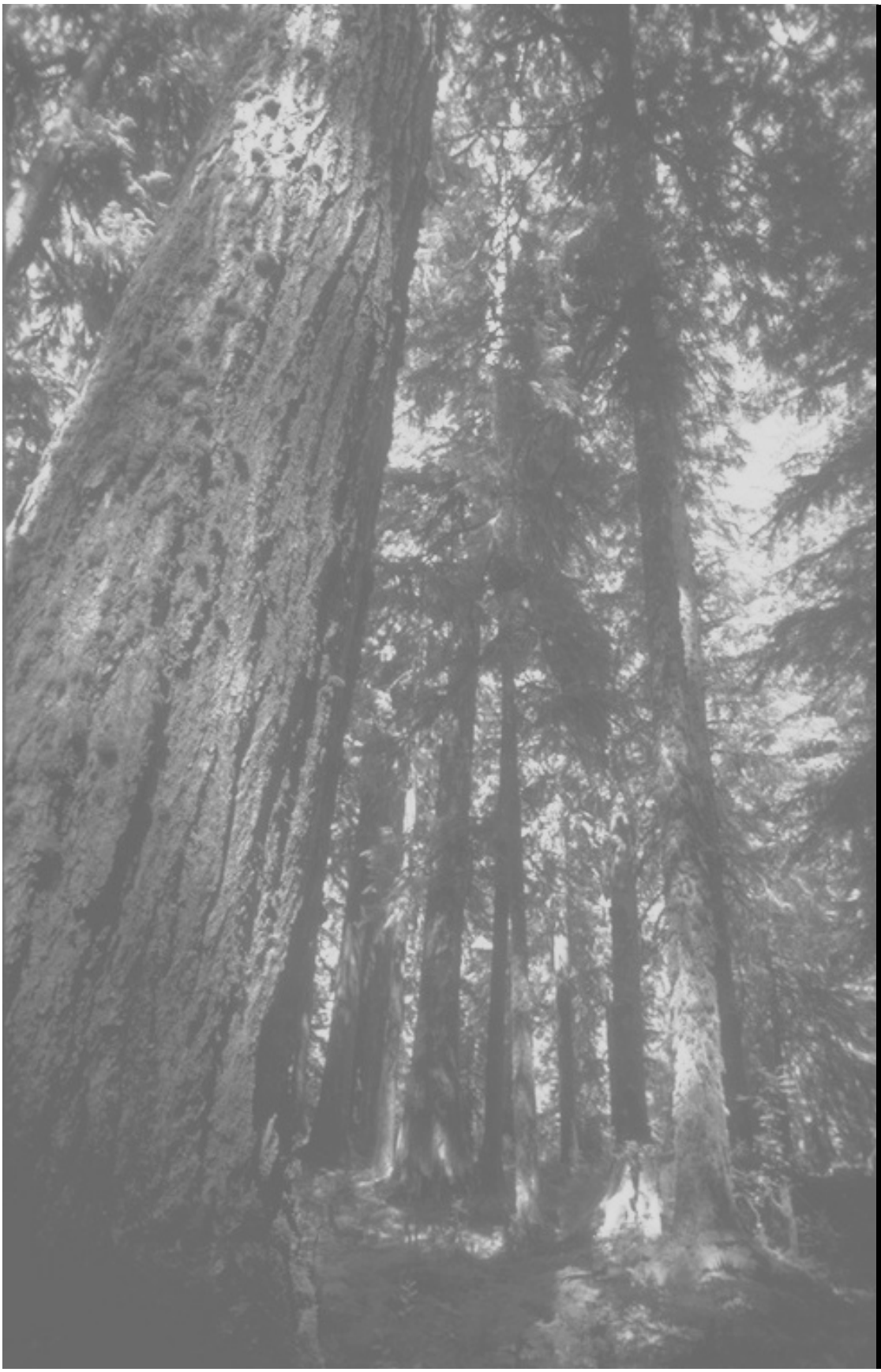


Chapter 5

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 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 is 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.

As of October 2000, nearly 100% of the Forest was covered by an initial watershed analysis. We are now developing a schedule which will identify which Forest watersheds are in need of a revised analysis due to changed management priorities, change in natural conditions, or inherent risk factors not reviewed in the first watershed analysis efforts of a decade ago.

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 interagency regional review team was formed and they developed a process to review projects or analysis located within the area covered by the Northwest Forest Plan.

The core of the reviews is an extensive questionnaire which was to be filled out for the project or watersheds selected.

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 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.

Northwest Economic Adjustment Initiative

Role and Activities in Community Development

The USFS Economic Action Program (EAP) is a group of Forest Service, State and Private programs listed in the congressional budget under one heading. EAP consists of four program components, as well as a variety of special projects funded by Congress every year.

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

The Northwest Economic Adjustment Initiative, part of the Northwest Forest Plan, is aimed at helping rural communities and businesses dependent on natural resources become sustainable and self-sufficient. 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 long term economic and social community capacity. Specific programs include:

Rural Community Assistance

The Rural Community Assistance program on the Mt. Hood National Forest provides technical and financial assistance to communities that build long term, sustainable capacity to address social, economic and environmental challenges. Each community project is derived from a broader strategic plan that reflects their long term community development sustainability needs. No new grants were awarded in 2003.

Ongoing Grants

The following existing grants continue to be monitored and administered:

Mt. Hood Towne Hall Restoration and Design Plan

This $40,000 grant to Hood River County will prepare a final design and engineering plans for restoration of the Mt. Hood Towne Hall. The Mt. Hood Towne Hall was originally a two-room school house built in 1914. It is currently owned by Hood River County and operated by a volunteer Board of Directors, and functions as a community center. An architectural and engineering report was completed in 1999 through an RCA grant; this project would prepare the final design and plans that would be used to acquire funding for the restoration work. Work identified in the preliminary report included renovation of the upper level, creation of a new main level accessible entrance and restrooms, and reconstruction of the lower level floor and plumbing.

Government Camp Pedestrian Overpass

This $32,000 grant awarded to Clackamas County Development Agency develops a preliminary and final structural design package for a pedestrian overpass across Highway 26 in Government Camp, Oregon. The structure is a parallel to, but separated from, the existing vehicle overpass that connects the Government Camp core area on the north side of Highway 26 to the south side of Highway 26. The south side contains Multorpor Ski Area, a future 250-unit single family subdivision; a connecting trail system to the Mt. Hood National Forest; and the private/public future sports facility venture that contains community meeting space, fitness, skateboarding, basketball, tennis and other sports facilities. The approaches on the existing overpass are too steep, thereby restricting sight distance for pedestrian use. People on the south side of Highway 26 drive the 1/3 mile into Government Camp for services instead of walking, biking or skiing. As a result, economic development is restricted.

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.

Technical Assistance

The Mt. Hood National Forest also provides technical assistance to rural communities.

Forest Staff provides information, support and/ or educational training opportunities that assist communities to build long-term economic capacity. In 2002, the Mt. Hood National Forest provided technical assistance to South Wasco County and the City of Maupin by continuing field surveying for a road design, and site surveys to produce topographic maps.

Wyden Amendment Projects

Section 334 of the USDI and Related Appropriation Act for fiscal year 1998, commonly and locally referred to as the Wyden Amendment, provides the Forest Service the authority to enter into collaborative agreements with other state and local partners to accomplish high priority restoration, protection, and enhancement work on public or private lands. The passage of the Wyden amendment has greatly broadened the agency's authority to not only utilize its resources anywhere within the ecosystem, but also as important, it has greatly increased our ability to establish and maintain financially based cooperative arrangements (substantive partnerships) with state, local, and tribal entities. Although the projects focus on ecological restoration, the benefits extend into the local communities and help increase community capacity.

Partnerships/Volunteers

Volunteers and 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. Our volunteers may work as part of an organized group or may have contributed their hours alone. They come from all over the country and serve from a few hours a week to those who come back year after year and stay for months at a time.

In 2003, the Forest established the Community Engagement Action Team and Board. The primary objectives of this action were to place emphasis on partnership development, engage community resources in Forest activities, to promote employee participation in partnership development and to move the Forest toward a wider community base of participation.

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 and Hosted Program opportunities resulted in:

- 1,510 participants
- Accomplishing 28 person years of work
- Valued at over $650,000 in FY03.

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

Senior Community Service Employment Program (SCSEP). Ten low-income seniors provided work for the forest, earning extra income while they gained job training skills. Four seniors were successful in transitioning into private sector employment during FY03.

Two Forest Service operated ***Youth Conservation Corps (YCC)*** non-residential crews employed 20 eastside youth as a result of the Forest pooling resources with:

- **Hood River County Juvenile Department**
- ***Oregon Youth Conservation Corps***
- **Mid Columbia Council of Governments**
- **Region 9 Educational Service District**
- **Trust Management Services**
- **Wasco County PAYCO.**

These partners contributed eighty percent of the funding needed for the YCC program. 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 National 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.

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**
- ***MacLaren School***
- ***Mid Columbia Council of Governments***
- ***Multnomah County Department of Juvenile and Adult Community Corrections***
- **Reynolds School District, Multnomah Youth Cooperative**
- ***Wasco County Juvenile Department***

As a result of these hosted programs, forest roads and trails have been brushed, riparian fencing built, facilities maintained and invasive weeds removed.

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
- Winter Snow Trails Specialists
- Wilderness Stewards

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

- Fishing Clinics
- Fall Festival with Mt. Hood Chamber of Commerce
- Geologic Surveys
- Trail Maintenance Work Days
- PIT (Passport in Time) Archeological Survey Projects
- Fish and Wildlife Surveys and Habitat Improvement Projects

Ten volunteer organizations accounted for 45% of the volunteer hours contributed on the forest last year. 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.

Enhanced Recreation Opportunities

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, Mount Hood Chapter**
- **P.U.M.P**
- **Discovery Bike Shop**
- **Oregon Nordic Club**

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

- ***Izaak Walton League, Washington County Chapter***
- ***Oregon Equestrian Trails***
- ***Oregon State Federation of Garden Clubs***
- ***Sierra Club***
- ***youth organizations such as Boy and Girl Scout troops***

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.

Winter sport enthusiasts reaped 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, a local volunteer groomed cross country ski trails in the Trillium Lake Basin. Donations from the community, local organizations and retailers as well as the folks that use the trail system covered the cost of the equipment rental.

Wilderness Stewardship

In support of the selected alternative developed in the revised Protection Plan for the Mt Hood, Hatfield, and Salmon Huckleberry Wildernesses, Wilderness Co-Stewardship agreements emphasizing education, monitoring and restoration were developed with several organizations including the ***Mazamas***, ***Crag Rats***, **Mt Hood Community College**, and ***Oregon Equestrian Trails***. As a result, 20 volunteer wilderness stewards, both equestrians and hikers, served as onsite stewards, primarily at the more heavily visited wilderness sites, as well as provided off site Leave No Trace (LNT) education. Education programs were provided at Cloud Cap, a popular wilderness entrance point, focusing on wilderness ethics and LNT. These programs reached an estimated 6,000 people.

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.

Funding and technical expertise were provided by the ***Mazamas*** to enhance the content and increase the frequency of climbing condition information for the South Side route, Mt Hood's most popular and least technical route which is also located within the Mt Hood Wilderness. The climbing condition information includes an emphasis on safety, reducing human impacts on the resource, and promoting LNT messages.

Conservation Education, Information 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 fourteenth year of providing "seamless" customer service. In CY 2002/3, this jointly staffed "one stop" information center was visited by over 200,000 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.

As a partner in ***Fire Prevention Cooperatives*** and local events, the Mt Hood reached well over 40,000 folks with key messages. Events ranged from the Pacific Northwest Sportsmen Show to county fairs and local festivals such as the Sandy Mountain Festival and the Dufur Threshing Bee.

Teachers, scout leaders and others have borrowed traveling programs, slide shows, displays and video tapes from the **Environmental Education Resource Center**, a library of educational programs and resource materials housed at Forest Headquarters and designed to share the wonders of the natural world with kids of all ages. In addition, employees across the forest participated in a wide range of local school programs focused on natural resource management.

The Mt Hood National Forest, **Wolftree, 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. It's estimated that another 8,000 visitors to Wildwood Park benefited from the environmental education facilities developed for Cascade Streamwatch as part of their use of Wildwood Park. Mt Hood natural resource professionals assisted in teaching onsite field sessions in another Wolftree school program, **Highland Ecology**, an ecological exploration of forest organisms.

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**, ***Boy and Girl Scouts*** and ***fisheries groups*** as well as ***local merchants*** who generously donate prizes.

The Mt. Hood communities/Chamber and businesses teamed with the Forest Service to put on an Autumn Festival in September. This first year partnership event is well on it's way to becoming a mountain tradition!

Resource Assistants from the ***Student Conservation Association*** and volunteers staffed the information and **Interpretive Program at Timberline Lodge**, a National Historic Site. Their lodge tours, nature walks and the information counter served over 50,000 visitors who hailed from the local area as well as from around the

country and around the world. SCA also had interns working in Breitenbush and on Mt. Hood trails.

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*** **t**o host the twentieth 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.

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 anadramous 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**.

In addition, working together to improve habitat through channel restoration, reshaping 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

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

Volunteers with ***SOLV (Stop Oregon Litter and Vandalism)*** as well as those involved in the ***Mt Hood Public Lands Cleanup Day*** and ***Cascade Geographic Society*** 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,*** in it's fourteenth year of a long termed partnership with the Barlow Ranger District, 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:

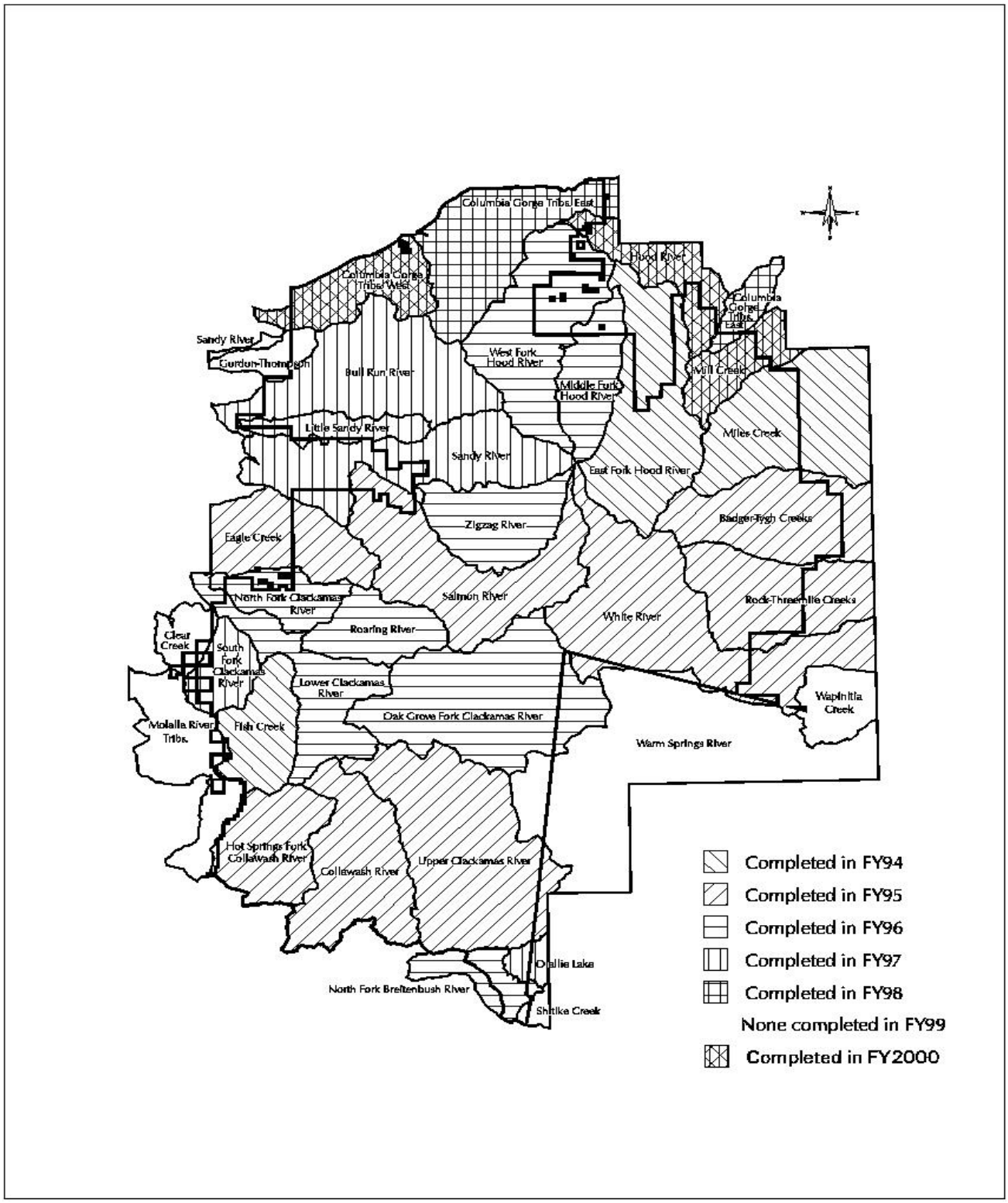
- **Portland Audubon Society**
- **Oregon Department of Fish and Wildlife**
- **Boise Cascade Corporation**
- **National Fish and Wildlife Foundation**
- **Coffee People** and
- **Leupold and Stevens**

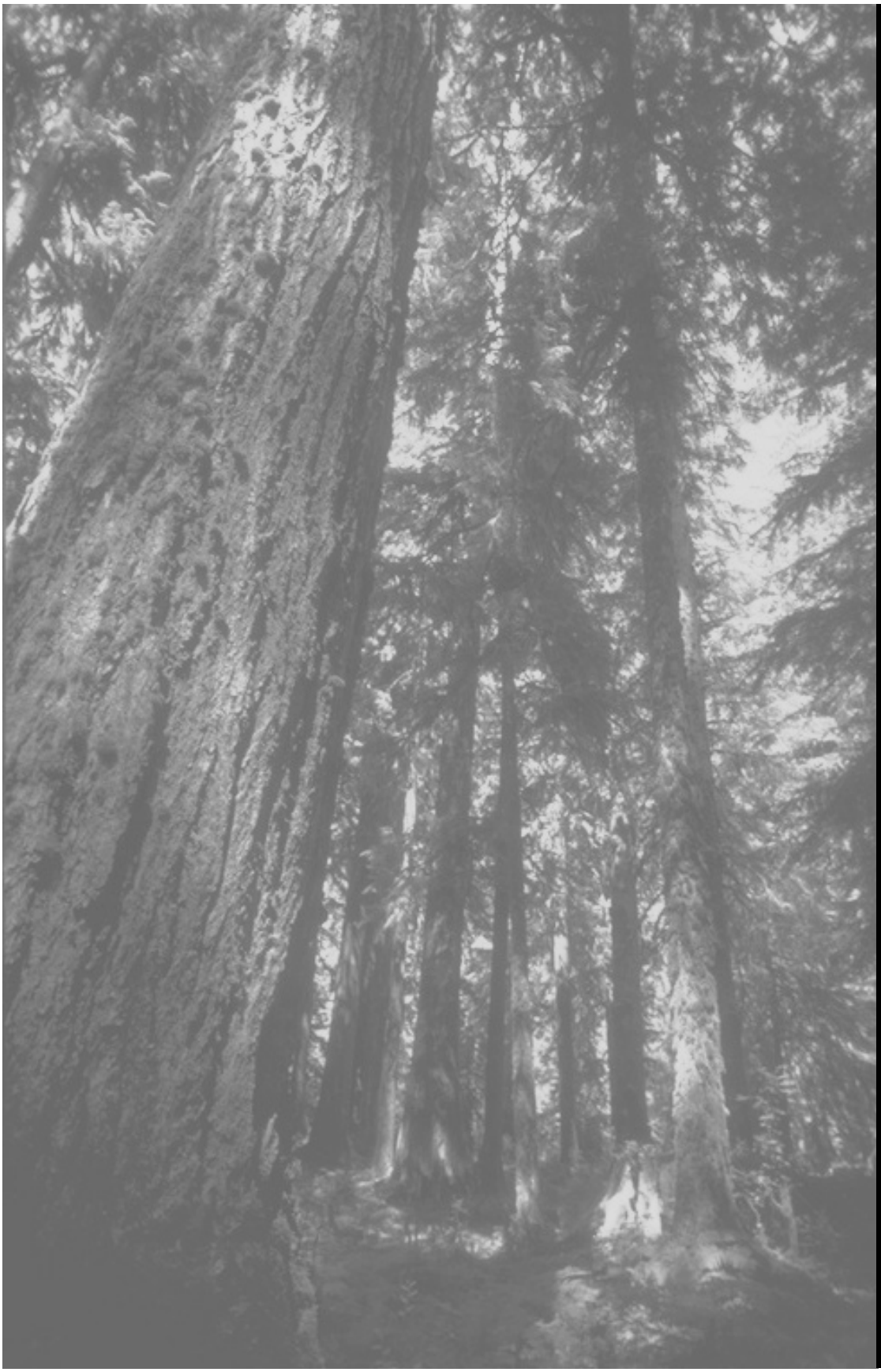
Teachers in the Woods, a bevy of teachers who dedicate their summers and gained training in natural resource management while they helped collect data for needed monitoring work, completed it's sixth field season. This collaborative effort between ***Portland State University***, the ***National Science Foundation*** and the several national forests is extended to the classroom during the school year as the teachers integrate their newly developed field skills into the classroom curriculum.

Funding for fisheries monitoring work, both Cutthroat spawning surveys and structure monitoring, at Bull Run Lake was provided by the ***City of Portland Water Bureau.***

The Oregon Archeological Society and Passports in Time have been ongoing partners in projects which inventory and catalog cultural resource sites.

Map 5-1. Mt. Hood National Forest Watershed Analyses Completed





Appendix A

Appendix A

List of Preparers

Wrightson, Jim - *Fire*

Shively, Dan - *Fisheries*

Blank, Myron - Land Management *Planning*

Cartwright, Linda - *Range*

Hamilton, Malcolm - *Recreation*

DeRoo, Tom - *Geologic/Mineral Resources*

McClure, Rick - *Heritage Resources*

Dyck, Alan - *Wildlife*

Dodd, John - *Soil*

Gerstkemper, Jack - *Transportation*

Hakanson, Shelley - *Partnerships*

Hickman, Tracii - *Fisheries*

Holder, Barb - *Financial*

Lankford, Nancy - *Silviculture*

Rice, Jeanne - *Ecology*

Rice, Jim - *Timber*

Sachet, Glen - *Partnerships/Rural Community Assistance*

Stein, Marty - *Noxious Weeds*

Steinblums, Ivars - *Water/Flood*

York, Shelly - *Desktop Publishing*