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Mt. Hood National Forest

Land and Resources Management Plan

FY 2006



Salmon River, Mt. Hood National Forest

Monitoring Report Fiscal Year 2006

Mt. Hood National Forest Land and Resource Management Plan

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Table of Contents

Summary.....	S-1
Progress Towards Sustainability on the Mt. Hood National Forest	S-1
An Overview of Current Resource Conditions.....	S-3
Key Management Issues.....	S-16
Chapter 1 - Introduction	1-1
Chapter 2 - Accomplishments/Results/Recommendations.....	2-1
Fire Management.....	2-1
Air Quality.....	2-5
Range Management.....	2-8
Noxious Weeds.....	2-11
Heritage Resources	2-17
Geology	2-21
Minerals.....	2-22
Fisheries Program.....	2-23
Water Resources.....	2-30
Transportation/Roads	2-40
Wildlife.....	2-43
Threatened, Endangered and Sensitive (TES) Plants	2-51
Soil Resources	2-55
Recreation.....	2-57
Forest Resources and Timber Supply.....	2-61
Chapter 3 - Financial Review	3-1
Chapter 4 - Forest Plan Amendments/Interpretation Process Amendments.....	4-1
Chapter 5 - Ongoing Planning Actions.....	5-1
Northwest Forest Plan	5-1
Other Community Engagement.....	5-9
Appendix A - List of Preparers.....	A-1
Appendix B – Draft Criteria and Indicators	B-1
Principle 1 – Social Well-Being	B-1
Principle 2 – Ecological Integrity	B-2
Principle 3 – Economic Well-Being.....	B-3

Figures

Figure 2-1. Growth, Mortality and Harvest, Mt. Hood National Forest.....	2-62
Figure 2-2. Acres Treated by Harvest Method	2-68
Figure 2-3. Reforestation Accomplishments	2-70
Figure 2-4. Stand Improvement Activities	2-70
Figure 2-5. Timber Sold and Harvested	2-74
Figure 3-1. Mt. Hood National Forest Budget Trends.....	3-3
Figure 3-2. Mt. Hood National Forest FTE/Position Usage.....	3-3

Tables

Table S-1. Summary Comparison Chart (by Fiscal Year).....	S-19
Table 2-1. Fire Causes and Acres FY 2002-2006.....	2-2
Table 2-2. Summary of Wildfires - Acres Burned by Size Class FY 2002-2006.....	2-3
Table 2-3. Prescribed Burning – FY 2006.....	2-6
Table 2-4. Acres of Noxious Weed Treatment in FY 2006.....	2-12
Table 2-5. Approved Projects at Timberline Lodge	2-17
Table 2-6. FY 2006 Aquatic Inventory Program.....	2-24
Table 2-7. FY 2006 Broad Scale Monitoring Programs Listed by Fourth Field Watershed Which Track Long-Term Trends of Aquatic Species and Their Habitats on the Mt. Hood National Forest.....	2-26
Table 2-8. Fish Populations of Concern on the Mt. Hood National Forest	2-27
Table 2-9. Water Year (WY) 2006 Eagle Creek Monthly Water Quality Parameter Averages.....	2-34
Table 2-10. Water Year (WY) 2006 Clackamas River (Carter Bridge) Monthly Water Quality Parameter Averages.....	2-35
Table 2-11. Road Maintenance Budget	2-41
Table 2-12. Species Observed from Mt. Hood Forest Remote Camera Transects	2-47
Table 2-13. Measured Detrimental Impacts by Silvicultural Treatment and Logging System	2-55
Table 2-14. General Overall Comparisons of Detrimental Soil Damage Using Data From Monitored Units Over Two Time Periods	2-56
Table 2-15. Mt. Hood Wilderness Visits from May 15 through October 15, 2006.....	2-58
Table 2-16. Mark O. Hatfield and Salmon-Huckleberry Wilderness Area Visits From May 15 Through October 15, 2006.....	2-58
Table 2-17. Mt. Hood National Forest Campground Use in FY 2006 by Number of Campers, Number of Sites Occupied, and Percent Occupancy	2-59
Table 2-18. Mt. Hood National Forest Ski Area Visits in Winter FY 2005-2006.....	2-60
Table 2-19. Mortality Class for Mt. Hood National Forest and Adjacent Lands	2-63
Table 2-20. Mortality Class for Mt. Hood National Forest Lands	2-63
Table 2-21. Percent of Acres Harvested by Management Area Category	2-72
Table 2-22. Acres Harvested by Forest Plan Management Area in FY 1996-2006	2-73
Table 2-23. Mt. Hood National Forest Special Forest Products Sold and Harvested in FY 2006	2-75
Table 3-1. Budget Levels Predicted/Actual (Partial List)	3-2
Table 5-1. Fifth Field Watersheds Containing Mt. Hood National Forest Lands and the Applicable Watershed Analysis.....	5-3

Maps

Map 2-1. Tree Mortality Map FY 2001-2006	2-64
Map 5-1. 5 th Field Watershed Map.....	5-4

Summary

Summary

Progress Towards Sustainability on the Mt. Hood National Forest

From 1999 through 2001, the Mt. Hood National Forest (the 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 the 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 and build a long-term method for looking at the Forest. The purpose of this report 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:

- Take actions today that do not compromise the choices of future generations.
- Steer us in the direction of systems thinking in our everyday management of the forests.
- Make better management decisions that would improve sustainable conditions.
- Help focus on the key issues or components helping managers to prioritize management actions and resources.
- Identify areas contributing to sustainability and areas that may be improved through adaptive management.
- Affect ecological carrying capacity to provide goods and services based on changing values and demands on our Forest.
- Engage in a dialogue with our publics about what sustainability means on our Forest to help create a common understanding and vision.
- Emphasize stewardship goals for National Forest Systems as addressed in the 2005 planning rule.

Systems-based Approach

Transitioning the monitoring report to a systems-based framework provides a more holistic view of the conditions and issues on the Forest in a sustainability context. A systems-based framework helps to describe important relationships across social, economic and ecological systems. It provides a logical link between sustainability and monitoring by helping place the monitoring component (the indicator) in the context of larger systems and its interactions with other components of the system. The framework is organized by the structures and functions of the ecological, social and economic systems. This represents the core set of criteria and indicators used to characterize the critical system components of forest sustainability on the Mt. Hood National Forest. The collective information from all indicators is what informs us about the status of forests. See Appendix B for the Mt. Hood National Forest's list of criteria and indicators.

The overview summary of the monitoring report, as well as some of the individual reports in Chapter 2, is presented in the systems-based framework.

An Overview of Current Resource Conditions

Ecological Integrity

The ecological criteria and indicators were based on maintaining integrity of ecological systems to provide sustainable forests.

Landscape Function, Structure and Composition

Ecosystems are dynamic and as such disturbances and stresses are part of them. It is important to note those disturbances and stresses that are either foreign to or outside the range of the disturbances and stresses with which the ecosystem evolved. Such disturbances and stresses pose a serious threat to the sustainability of a given ecosystem because they may exceed the ability of the ecosystem to accommodate them without major changes in the structure, composition, and/or function components. Disturbances impact all aspects of ecosystems at a landscape level including successional pathways, carbon balances, nutrient cycles, water quality and quantity, habitat and forage availability, scenery, availability of products, and economic values of products. The landscape function, structure, and composition criteria and indicators provides us with information about the landscape's ability to increase or decrease the effects of fire and wind on the Forest; to provide habitat for different kinds of wildlife including rare species; to resist and recover from disturbances; to filter and maintain water quality; and to provide information on the diversity and pattern of land cover types. It also helps us to look at the implications of vegetation management actions including road building on attaining landscape-desired conditions.

These criteria and indicators focus on the processes, structures and composition that influence landscape patterns and distribution.

Wildfire/Prescribed Fire

Fire is a dominant disturbance process that has influenced vegetation at many spatial scales over the past several centuries. At a broad scale, fires influenced vegetation patterns by affecting the distribution of stand types and seral stages across the landscape. Intensity and frequency of fires can affect composition and structure of plant communities at a finer scale. Current vegetation pattern and plant community dynamics have been altered by fire suppression. This raises sustainability questions about what are the effects of the current fire regimes and management activities towards achieving desired vegetation and landscape patterns.

The overall goal of the fire management program is to provide fire protection capability to support attainment of land and resource objectives. Fire protection and fuel treatment objectives are identified in the Forest Plan for monitoring. It estimates that there should be no increase in the number and acres of human-caused wildfires (56 fires and 408 acres/year based on five years of data) with implementation of standards and guides. To date, the number of fires and acres burned are below Forest Plan estimates. The biggest change in 2006 occurred with the August 2006 Blister and Mt. Hood Complex fires resulting in over 2640 burned acres as a result of lightning.

Changes in vegetative conditions, however, have altered disturbance regimes, particularly on the drier eastside of the Forest; resulting in the potential for larger, more severe fires that are outside the historic range of variation.

Changes in stand structure, species composition, and accumulated fuels have predisposed extensive areas to insect infestations, disease, and high-intensity wildfires that may threaten nearby communities, watersheds and key ecological components. It is expected that resource damage and value lost will increase.

These altered disturbance regime areas are specifically targeted by the 10-Year Cohesive Strategy and the Mt. Hood 5-year strategy for integrating fuels and vegetation treatments. Specific objectives of these strategies include modifying fire behavior to protect homes, infrastructure and municipal watersheds in the Wildland Urban Interface (WUI), and ecologic restoration of stands and landscapes outside of the WUI. In 2006, the Forest completed hazardous fuel treatment of 2,032 acres of which 1,827 acres were in WUI, Fire Regime 1.

The Healthy Forest Restoration Act (HFRA) passed in 2003, the related Healthy Forest Initiative (HFI), and the Tribal Forestry Protection Act of 2004 developed new administrative and legislative tools to help restore healthy ecosystems and assist in executing core components of the National Fire Plan that will accelerate treatments designed to restore healthy ecosystems. In 2004 and 2005, the Forest started planning projects under HFRA and HFI.

The Forest is continuing to seek markets for biomass and small-diameter material. Development of local co-generation facilities and mobile chipping plants are examples of several processes that will help to make biomass utilization a reality.

The Forest has prioritized planning and implementing landscape scale fuels and vegetation management projects entering into cooperative efforts with the State, Tribal governments and local landowners. An effort to update the fire regime condition classes, and forest vegetation and fuels data is continuing and will greatly enhance our ability to quantify and monitor many

deteriorating conditions in these ecosystems, including how current fire regime and management activities are affecting vegetation and landscape patterns, how to incorporate fire back into the ecosystem, and how Forest Service efforts in stewardship, partnerships, education and training are contributing to restoring forest health and safety. This effort should provide fire managers with the landscape-scale information that will help improve strategic decision-making in both the prescribed fire and wildfire arenas.

Harvest/Silviculture

Harvest, another dominant disturbance process, influences vegetation patterns by affecting the distribution of seral stages across the landscape. Harvest also can influence successional processes by alteration of stand structures and composition. Timber and wood fiber production continues to be a principal forest activity. However, over the last decade, there has been a decline in timber harvest. Less than half of one percent of the land base is being treated by harvest to meet various objectives. Vegetation management is prioritized towards restoration treatments such as reducing fuel hazards, improving wildlife habitat and maintaining forest health. There also has been an overriding shift from regeneration harvest to commercial thinning. This raises sustainability questions about the effects of management activities on achieving desired vegetation and landscape patterns.

Harvesting continues to occur at a rate below the annual probable sale quantity. In 2006, harvest occurred on 2,083 acres, with the majority of the harvest, 85%, occurring on lands designated as matrix lands in the Northwest Forest Plan and a lesser amount of harvest in the riparian and late successional reserves. Thirty-four percent of harvest occurred on the Mt. Hood Forest Plan land allocation C1- timber emphasis with 66% occurring on B allocations where timber production is a secondary goal. Commercial thinning was the harvest method on 61% of the acres, selection harvest on 26%, clearcut

Summary

with reserves or shelterwood on 10%, and salvage on 3% of the acres. Pre-commercial thinning was accomplished on 4,405 acres on the Forest. This is more than double the amount of acres pre-commercially thinned in Fiscal Year (FY) 2005, largely due to the use of stewardship contracting authorities and Payments to the Counties funding.

Current and potential future forest health issues continue to be a concern on the Forest. This includes a backlog of 14,000 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. Recommendations are for more thinning to improve stand conditions in both the pre-commercial and commercial size classes, and salvage harvest to reduce accumulations of hazardous fuels in select locations.

Noxious Weeds

Noxious weeds or invasive plant species are recognized as a major threat to native plant communities especially on disturbed sites and grasslands. Invasive plants displace native vegetation, alter species composition of forests and rangelands, reduce the productivity of desired commodities, reduce species diversity, and adversely affect recreational quality. The Forest Plan goal is to control noxious weed infestations and prevent their spread through a combination of efforts including prevention, education, inventory, treatment, and monitoring. In 2006, the Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) for Preventing and Managing Invasive Plants in the Pacific Northwest Region (October 2005) adds invasive plant management direction to all Forest plans in the Pacific Northwest Region. Management direction includes invasive plant prevention and treatment/restoration standards.

The Mt. Hood National Forest is currently preparing a site-specific invasive plant treatment Environmental Impact Statement to treat 21 invasive plant species on approximately 11,000 gross acres using integrated pest management techniques.

Currently, the total area of inventoried noxious weed infestation on the Forest is approximately 3,000 acres. This underestimates actual total infested acres, which have not been inventoried. Currently, only targeted weeds are monitored and resources are lacking for a forest-wide systematic survey. Untreated hawkweeds and Japanese knotweed sites are continuing to spread and new infestation sites are being detected.

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. Monitoring is conducted on weed control treatments, known infestations and new infestations. A total of 425 acres of noxious weeds were treated on the Forest in 2006.

Emphasis continues to be placed on the detection of satellite populations of non-native hawkweeds and Japanese knotweed that are continuing to spread on the Forest. Hawkweeds displace native forage species, which has an impact on the health of elk populations. Knapweed is well-entrenched and established across the eastside of the Forest but because of a combination of control efforts and its habitat preferences, it has not become widespread on the westside. Houndstongue continues to spread into new areas on Barlow but appears to be limited to this portion of the Forest.

Forest Insects and Diseases

Disturbances related to forest insects and diseases are mapped during the annual Aerial Detection Survey conducted by the Forest Health Protection group. For the last several years, bark beetle outbreaks have caused a significant amount of tree mortality on the Mt. Hood National Forest and adjacent lands. Approximately 113,000 acres on the Forest and 84,000 acres on adjacent lands, namely the Warm Springs Reservation have been affected. The primary species affected have been lodgepole pine and true firs. Beetle activity remains high on the eastside of the Forest and along the high plateau of the Cascade Crest and is expected to continue for the next few years until the host habitat is depleted.

In addition, 40 year-old ponderosa pine stands on the eastside are becoming imminently susceptible to bark beetle attack due to high stocking densities. The 1983-1993 western spruce budworm (*Choristoneura occidentalis*) outbreak is now contributing to increased fuel loadings as trees have fallen.

While the beetle killed trees provide a temporary food source for some bird species and homes for small cavity nesting birds, the large scale infestation will likely increase fuel loadings and concerns over hazardous fuels. In appropriate land allocations, the salvage of beetle killed trees can provide wood products, firewood or biomass for energy production.

Field surveys were completed for both the high elevation whitebark pine, and the northern most populations of sugar pine located on the Clackamas River Ranger District. In summary, both the whitebark pine and sugar pine populations are exhibiting severe decline due to a combination of a non-native pathogen, white pine blister rust, and the mountain pine beetle. It is recommended to pursue restoration activities and re-establishment of new populations with blister rust resistant seedlings.

Hillslope Processes/Geologic Resources

The Forest Plan direction is to maintain hydrologic and physical balances to prevent reactivation or acceleration of large slow-moving earthflow areas. The desired conditions for these areas are forest stands of varying age classes, mostly greater than eight-inch diameter trees, with management activities designed to maintain long-term stability. Since monitoring began in 1991, no acceleration or initiation of earthflow movement has been measured or suspected as a result of timber harvest or road building activities on earthflow areas.

Vegetation Composition and Pattern

All seral stages (early, mid and late) and their distribution on the landscape provides information on the diversity and pattern of land cover types that provide wildlife habitat, filter and maintain water quality, and provide connectivity. With fire suppression and reduction in timber harvest, there has been a decline in "quality" early seral habitat. Quality early seral provides a richness of structures, biodiversity, and a diversity of processes. Many species are tied to all seral stages and are directly tied to some components of early seral. The limited forage availability for deer and elk populations is becoming a concern on the Forest. Also, there is a concern that the increase in dense mid-seral stands on the eastside and backlog of stands needing some level of stocking control, such as precommercial thinning, will contribute to the potential for large disturbances such as wildfire, windthrow, or insect outbreaks. This concern extends to the plantations within Late Successional Reserves.

Ecosystem Function, Structure, and Composition

Lincoln, Boxshall and Clark (1982)¹ defines an ecosystem as: “A community of organisms and their physical environment interacting as an ecological unit” These criteria include physical environmental indicators that are related to soil, air and water characteristics. Physical environmental indicators are essential in tracking sustainable forest management because the maintenance of appropriate levels of soil oxygen, nutrients, moisture, and organic matter is key to the long-term productivity and resilience of forest ecosystems.

Productive Capacity

Tree growth rates can be used as estimates of productive capacity. In addition, one measure of sustainability is whether the level of timber harvest is considered sustainable in terms of forest growth. Overall annual growth is more than 13 times harvest levels and annual mortality exceeds harvest by a factor of 8 to 1. On matrix lands only, growth is almost 3.7 times the rate of harvest. The trend for small diameter, dense stands continues to increase, leading to conditions susceptible to large disturbances such as wildfire, windthrow, and insect outbreaks.

Carbon Sequestration

Potential changes in the physical and chemical nature of the earth’s climate are likely to have impacts on forest ecosystems. The extent and magnitude of these changes are uncertain. Climate change continually resets the stage on which successional dynamics, such as fire, flood, insect infestations, and disease, play out.

Interest in carbon sequestration has increased in an effort to explore opportunities for climate change mitigation. Carbon sequestration is the process by which atmospheric carbon dioxide is absorbed by trees through photosynthesis and stored as carbon in biomass (trunks, branches, foliage, and roots) and soil. Sustainable forestry practices can increase the ability of forests to sequester additional atmospheric carbon while enhancing ecosystem services. Planting trees, restoration, increasing health and resiliency of forests, increasing forest growth, and treating invasive species are examples of ways to increase forest carbon.

Pacific Northwest forests have a high potential to store carbon due to their composition of long-lived species and high productivity. The role of federal forests in managing under the uncertainty of climate change is still being formulated and the evaluation of global change effects is perhaps more appropriate at the regional level than at the project level. However, managers are beginning to consider climate in their landscape prescriptions, including anticipating changes in disturbance regimes and managing for health and resiliency.

This raises two sustainability questions:

1. What is the balance between carbon storage and maintaining natural fire regimes?
2. How does land use, natural disturbances, and climate change affect three key sets of ecosystem services: carbon and nutrient dynamics, biodiversity, and hydrology?

¹ Lincoln, R.J., G.A. Boxshall, and P.F. Clark. 1982. A dictionary of ecology, evolution and systematics. Cambridge University Press, Cambridge, UK.

Air Quality

Forest Plan goals for management of air resources are to continue to improve the existing character of air quality from the past; management activities do not degrade Class I or II Wilderness and general forest standards; and the requirements of the State Implementation Plan for the Clean Air Act are met.

Smoke from prescribed fires is the primary air quality concern from management activities. The goal of the Forest Plan is to reduce emissions 63% by the end of the first decade of the Forest Plan, which is being achieved to date. The Mt. Hood National Forest remained in compliance throughout the monitoring period (October 2005 – September 2006).

Nitrogen is the pollutant of most concern on the Mt. Hood National Forest. Lichens are used to monitor air pollution on the Forest. In 1994-1997, with re-measurements in 2004 and 2005, Mt. Hood botanists surveyed lichens and collected common species for chemical analysis. Lichen monitoring has shown that nitrogen concentrations have increased regionally due to increasing population and fossil fuel combustion, most notably along the northern boundary of the Mt. Hood National Forest and in the Columbia River Gorge. The Clean Air Act has successfully held industry contributions of nitrogen oxides and sulfates steady. Sulfur deposition, although not increasing, continues to be elevated above natural levels on the eastern part and western boundary of the Forest and in the Columbia River Gorge corridor. The Mt. Hood Wilderness, a Class I airshed, has very high air quality and remains unaffected by regional increases in nitrogen. Ten year re-measurements will be performed in 2007.

Water Quality

The Forest Plan goal 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. The purpose of monitoring is to assess Forest Service compliance with the Clean Water Act, to collect data on water quality trends, and to monitor the effectiveness of watershed restoration work. With continued implementation of Best Management Practices, 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.

In order to monitor condition and trends in water quality, 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 a municipal water supply. The water monitoring stations 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 State water quality standards for temperature. In some cases, the elevated water temperatures are naturally high, while in others a past fire or timber harvest activity may be partially responsible. In 2006, most streams out of 50 streams monitored forest-wide did not meet one or more of the recently adopted (March 2, 2004) and more stringent Oregon Department of Environmental Quality (DEQ) water temperature standards even though these same streams, in most cases, provide very good water quality for fish.

Summary

The Federal Clean Water Act requires DEQ to develop a plan with goals and pollution control targets for improving water quality in the watersheds where water quality standards are not met. DEQ is doing this by establishing Total Maximum Daily Loads (TMDLs) for each pollutant entering the water. A TMDL describes the amount (load) of each pollutant a waterway can receive while maintaining compliance with water quality standards. TMDLs for water temperature have been completed by the DEQ and approved by the Environmental Protection Agency for the Sandy (March 14, 2005) and Hood River Basins (January 1, 2002).

The Mt. Hood National Forest will address water temperature TMDLs for any streams listed as “impaired” for water temperature by implementing the Northwest Forest Plan Temperature TMDL Implementation Strategies. Approved by DEQ in September 2005, the TMDL Implementation Strategies provide guidelines for riparian shade management.

Soil Productivity

The Forest Plan goals are to protect, maintain and restore soil productivity, and to stabilize or restore damaged or disturbed soil areas. On a forest-wide basis, 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 Forest Plan standards. This trend is likely due to the decline in timber harvest levels over the last decade, the efforts of sale administrators and operators to continue to minimize damage, and with improved equipment technology. 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. 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.

Ecological Legacies

Ecological legacies, such as remnant snags, large down woody debris and caves are important components of the environment that persist through multiple phases and successional changes in an ecosystem. The Northwest Forest Plan provides standards and guidelines for snags and down woody material to meet wildlife habitat needs and maintenance of organic matter for soil productivity. Current monitoring data indicate that snag retention levels are meeting standards and guidelines and are increasing over time. On harvest units, however, down and woody materials are falling below current guidelines.

Population Function and Structure

Maintaining native species is a fundamental tenant of any conservation effort. These criteria look at maintenance of viable populations of native species, including the processes that define interactions between them and the occurrence of native species.

Population Viability

The National Forest Management Act requires that “...fish and wildlife habitat be managed to maintain viable populations of existing...species in the planning area.” To ensure this, the regulations direct that habitat must be provided to support a minimum number of reproductive individuals and habitat must be well distributed so that those individuals can interact with others within the planning area.

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. The overall abundance of anadromous fish and bull trout are low in those streams and rivers monitored on the Forest.

In 2006, Oregon Department of Fish and Wildlife led an effort to update the status of bull trout in the Hood River system. Results were discouraging. Preliminary results predict less than 100 bull trout adults in the Hood River basin. Salmon populations continue to show large fluctuations in size. The most extensive and complete data set on the Forest is in the Clackamas River. The twelve-year data set has shown general trends of increasing numbers of steelhead smolts and decreasing numbers of Coho smolts. 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.

Similar to fish habitat, there are some concerns with wildlife habitat. With reduction in regeneration harvest on the Forest and the suppression of fire, there is a concern that forage habitat for early seral dependent species such as deer and elk is declining. Forage is a limiting factor for much of the Mt. Hood National Forest, especially for winter range areas. It is inevitable that populations of deer and elk will decline. Road densities especially in key areas like winter range areas are barriers to connectivity. Other habitat concerns for wildlife include increasing pressure on unique or sensitive habitats from recreation uses, roads and grazing.

Species of Concern

The small populations of bald eagle and peregrine falcon appear to be stable. The USDI Fish and Wildlife Service intends to delist the American bald eagle in June of 2007 because the eagle population has been expanding and is no longer considered threatened. The peregrine falcon was delisted in 1999. An interagency demographic study sampling spotted owl populations across its range has replaced monitoring on individual Forests. To date, the demographic study reports a 2.8% decline per year in the spotted owl population for Oregon.

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 invasive plant encroachment, livestock grazing, off-road vehicles, and recreational activities. Species that grow in forested habitats appear to be stable at this time and implemented mitigation measures for ground disturbing activities have been effective in maintaining the integrity of sensitive plant sites. From 2000-2006, 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.

Genetic Function

Genetic diversity is fundamental for populations of forest dwelling organisms to be able to adapt to changing environmental conditions. The Forest Plan direction is to maintain genetic diversity of forest stands and to maintain forest health through genetic resiliency thus reducing impacts of disease, animals, insect, or climatic damage. This criterion can be used to address issues related to effects of forest management on genetic diversity. Current reforestation practices ensure genetic diversity by planting appropriate species and additional species diversity from natural regeneration.

Social Well-Being

Social well-being comprises those aspects of life that we care about as a society. The well-being of forest-based communities are important social values and important aspects of public decision-making and policy regarding forests. Therefore, social sustainability addresses how humans interact with natural systems and how they value ecological systems (Hoekstra et al., 2000)². As communities develop greater capacity and more resources, they can act as stewards of forest resources, maintain and improve their social well-being and advance sustainable management. Partners, communities, interests and ecosystems are the strengths and interactions that enable the Forest to fulfill its mission and provide balance between meeting socioeconomic and environmental needs.

Collaborative Stewardship

Social criteria and indicators are based on the social values, institutions and processes that address social well-being, and hence social sustainability. Collaborative stewardship is an example of a social process that integrates public values into forest management activities and hence, increases the likelihood of sustainability.

Collaborative stewardship is the opportunity to have public values and beliefs heard, considered and incorporated into forest management activities, and the ability of publics to participate in management actions. Collaborative stewardship involves citizens in forest management activities, builds community and forest sector capacity, and integrates various kinds of expertise in the decision-making process.

Collaboration between local, state, federal agencies, tribes and other organizations continues to provide the necessary foundation for getting work done on the Forest. Watershed councils, Resource Advisory Committees, non-profit organizations, and community work are examples of public involvement in natural resource management and the decision-making process.

The Northwest Economic Adjustment Initiative, aimed at helping rural communities and businesses dependent on natural resources become sustainable and self-sufficient, brings the Forest Service together with eight other federal agencies, as well as with State and local governments, to fund projects that are community priorities for building long-term economic and social community capacity. An example is the Rural Community Assistance program on the Mt. Hood National Forest which provides technical and financial assistance to communities to address social, economic and environmental challenges.

The Mt. Hood Fuel/Vegetation Strategy

The Forest is continuing to assist and support communities in the development of Community Wildfire Protection Plans. Both Clackamas and Wasco CSouties completed their plans in fall of 2005. These community efforts provide the basis for on-going partnerships and future collaborative efforts to reduce wildland fire risk around homes and property.

² Hoekstra, T.W., Allen, T.F.H., Kay, J.J. & Tainter, J.A. (2000). Criteria and Indicators for Ecological and Social System Sustainability with System Management Objectives. In: S.J. Woodley, G. Alward, L. Iglesias Gutierrez, Hoekstra, T.W., B., Livingston, L., Loo, J., Skibicki, Al, Williams, C. & Wright, P. CIFOR North American test of criteria and indicators of sustainable forestry, Volume 1, USDA-Forest Service. 1.

The Mt. Hood Strategic Stewardship Framework

Mt. Hood National Forest's Strategic Stewardship Framework will establish direction and context for forest projects and programs by providing a business framework to use in decision making, and in building, strengthening and delivering relationships, internally and externally. This framework will provide the structure for citizen, non-governmental organizations, corporations, state and local governments, and other federal agencies to become engaged in the stewardship of the Forest. This will set the stage for public interest and vision for decisions to be made in the Land and Resource Management Plan.

Community Engagement Action Team

In 2003, the Forest established the Community Engagement Action Team (CEAT) and Board to help place emphasis on partnership development, to engage community resources in Forest stewardship activities, and to move the Forest towards a wider community base of participation.

In 2005, the CEAT organized a session called "*Engaging Citizens in Forest Stewardship through Volunteerism – Creating the Forest Service of the Future*" resulting in the development of a Citizen Stewardship Plan for Action in 2006. The Plan for Action's objectives are to build a collaborative coalition Citizen Stewardship, enhance and improve existing volunteer programs, and to develop new tools for volunteer engagement.

River Keeper Program

The Mt. Hood National Forest has been a major catalyst in the River Keeper Program that promotes the stewardship of the Upper Sandy River and Fifteenmile River Basins through coordination of federal, state, county, and private restoration efforts.

Stewardship Contracts

In FY 2005, a collaborative group known as the Clackamas Stewardship Partners (CSP) was formed with an interest in utilizing stewardship contracting authorities to implement priority watershed restoration and wildlife projects in the Clackamas watershed. This collaborative group is made up of diverse stakeholders including county government, local environmental organizations, a college professor, and members of a hunting association. Due to their successful collaborative efforts, the Forest received authority for stewardship contracting and successfully advertised two separate stewardship contracts. The restoration work outlined in these contracts included commercial thinning of 40 to 50 year-old plantations, wildlife enhancement work and precommercial thinning in Late Successional Reserves.

Sandy River Basin Agreement

The Sandy River Basin Agreement Team is a consortium of state, federal and local government organizations and private conservation groups interested in the long-term ecological health and management of the Sandy River Basin. Their focus is to develop a strategy to maintain and recover salmonids listed under the Endangered Species Act in the Sandy River watershed. In 2002, Portland General Electric and the Sandy River Basin Agreement Team partners signed off on a settlement agreement to decommission Marmot and Little Sandy dams. In 2004, these partners identified geographic areas in the Sandy River Basin important for the persistence and restoration of salmon and steelhead populations, known as the Anchor Habitats project from which restoration efforts will focus to restore salmon and steelhead habitat.

Basin-wide Aquatic Habitat Restoration Strategies

In 2006, two collaborative working groups completed two basin-wide aquatic habitat restoration strategies: the Sandy River Basin and Hood River Basin Aquatic Habitat Restoration Strategies. The purpose is to address aquatic habitat restoration needs for recovery and long-term persistence of fish populations in the basin. Using a holistic watershed view, the strategy is intended to guide investments over the long-term, completing high priority restoration actions in the highest priority watersheds, thereby achieving benefits at the watershed scale. The strategies look at restoring connectivity, long-term physical and biological processes, ecological function of riparian areas, and short-term in-stream habitat conditions.

Social and Cultural Values

These indicators provide an overview of community values and needs, and the extent to which those values are integrated into forest management decisions and policy discussions. Cultural and spiritual connections to forests vary among local communities and are represented by social values that the local communities place on a forest's contribution to providing scenic landscapes, recreational activities, special places, and traditional and religious uses.

Recreational Values

The Forest Plan goal is to provide year-round dispersed and developed recreation opportunities. Towards those goals, the Mt. Hood National Forest is continuing work on some efforts to define the recreational needs of forest visitors.

The National Visitor Use Monitoring (NVUM) project, the most thorough and reliable quantitative study in the past two decades about recreation use on the Forest, was conducted during 2003. The NVUM project was implemented as a response to

better understand the use, importance, and satisfaction with National Forest System recreation opportunities. In 2004, the NVUM Round 1 results revealed that the Mt. Hood National Forest ranks seventh in the nation according to the number of National Forest visits (4.076 million visits). For national, regional, and individual forest reports, visit the NVUM web site:
<http://www.fs.fed.us/recreation/programs/nvum>.

In 2006, visitation to the Mt. Hood Wilderness was significantly lower than previous years, possibly due to closures of several popular trails in August resulting from fires. Use of the Forest's five alpine ski areas during the 2005/2006 season was significantly higher than in the previous season. Campground occupancy increased, particularly in the Clackamas Complex campgrounds. In 2007, the Forest will engage in recreation site facility master planning to examine supply, demand and cost to operate and maintain developed recreation facilities. In general, the Forest has more developed camping capacity than demand.

Cultural Heritage

The Forest Plan goal is to protect and preserve ceded rights and privileges of Native American Indians to access and use the Forest for traditional and religious values, including consultation of projects located on these accustomed areas. Another goal is to protect, maintain and enhance prehistoric and historic sites, buildings, objects and antiquities of local, regional or national significance. During 2006, monitoring of heritage resources showed no adverse impacts from project activities. Consultation with the Confederated Tribes of the Warm Springs (CTWS) was completed on all projects located on tribal lands and usual and accustomed areas. Historic buildings and structures were maintained, stabilized and repaired.

Historic preservation efforts during 2006 focused on Timberline Lodge, emergency measures to protect Cloud Cap Inn from wildfire and Bagby Guard Station. The Forest evaluated a large number of historic resources to determine National Register eligibility. This included the Vine Maple, the Zigzag, the Zigzag Ski Club, and the Flag Mountain Recreation Residence Tract.

Economic Well-Being

The economic criteria and indicators were based on two fundamental principles of sustainable development:

- Maintain sufficient natural, built, and human/social capital through time to provide non-declining flows of the goods and services desired by society from the Forest.
- Distribute “the goods” and services so “equitable” access and benefit are achieved for all major stakeholders and for future generations.

Natural, Human and Built Capital

Access and Travel Management

The Mt. Hood National Forest continues to advance toward the goals of the Forest Service Roads Agenda. The size of the Forest’s transportation system is decreasing. The Forest is maintaining or improving mainline road system while decommissioning or closing unneeded roads. The 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, the Forest focused efforts on storm proofing and closing roads, rather than decommissioning a few roads at a high cost.

Campgrounds

Visitation and utilization data were reported by permit holders for concessionaire managed campgrounds in 2006. The data indicates that occupancy has increased, particularly in the Clackamas Complex campgrounds. Specifically, concessionaire records indicate that the number of campers in the Clackamas Complex campgrounds increased by 25% from the previous year, suggesting a slight increase in party size. Like similar older recreation complexes throughout the National Forest System, the campgrounds on the Forest fill a social and economic niche that many long-time visitors appreciate. That user group, however, is not expanding as originally projected, and may be decreasing. Based on current and predicted use patterns and interest, Mt. Hood National Forest has more developed camping capacity than demand. In 2007, the Forest will develop a recreation site facility master plan (RSFMP) to look at supply, demand, cost to operate and maintain developed recreation facilities and determine how best to meet current and future public recreational needs.

Trails

The Forest currently has 977 miles of trails compared to the Forest Plan projection of 1,560 miles during the second decade of the Plan. The Forest Plan also projected an average of 74 miles of trail construction and reconstruction per year. With diminished funding, actual accomplishment is less than 10 miles per year. During 2006, the Forest awarded a contract for reconstruction of 8.8 miles of the Pacific Crest Scenic Trail.

Flows of Goods and Services

Timber

Sustaining a predictable supply of forest products to the region's economic system provides jobs at both the local and regional scales, and reduces the demand for imported forest products.

In FY 2006, the budget allocation scheduled the Forest to offer for sale approximately 24.5 million board feet (MMBF) (38% of probable sale quantity [PSQ]). The Forest successfully offered for sale approximately 27.9 MMBF (44% of PSQ). This was accomplished using ten separate timber sales and two stewardship contracts, which will also generate approximately \$424,000 for restoration projects as well as \$50,000 of retained receipts for future restoration projects. The Forest also made significant progress on planning projects that accomplish wildfire risk reduction objectives and commercial thinning in overstocked plantations. These planning efforts will result in timber sales and stewardship contracts in FY 2007.

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 result in sales with no interested bidders. In FY 2007 and FY 2008, the Forest expects to provide a diverse mix of species, sizes and quality. 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. The Forest is striving to set a global example for sustainable forest management.

Range

The Forest Plan goal is to provide quality forage conditions for commercial domestic livestock and to prevent unacceptable damage to other resource values. Approximately 15% of the total acres on the Mt. Hood National Forest are in grazing allotments. Issuing grazing permits to local ranchers adds an element of economic viability to ranch operations, while at the same time, the private ranch lands provide essential big game winter habitat which is in critical short supply. In 2006, actual livestock use was 1,671 head months out of a total of 3,684 head months under permit. Monitoring of existing vegetation conditions and long-term trends are in place on all allotments using a photo trend methodology. These measurements indicate that overall range condition is stable or improving and moving towards Forest Plan objectives. Utilization monitoring of one riparian site showed impacts from over utilization of current year's forage by both permitted livestock and wildlife. There is also concern of continuing livestock pressure on riparian areas due to loss of transitory range, which is a result of significant decrease in harvest acres and heavy recreation use.

Ski Areas

Use of the Forest's five alpine ski areas during the 2005/2006 season was significantly higher than in the previous winter season. The snow pack on Mt. Hood was above normal, reaching a depth of 203 inches in March 2006. The most dramatic effect of these snow conditions was a 159% increase in visitations at Mt. Hood Meadows compared to a 27% increase for the region.

Minerals

The Forest Plan goal is to facilitate exploration and development of energy and mineral resources while maintaining compatibility with other resource values. The Mt. Hood National Forest continues to be able to supply high quality rock products to the general public, other government agencies, and for their own use. The continuing demands for “landscape rock” are depleting sources of easy accessible loose rock material on the Forest. In 2006, there were eight projects utilizing 7,700 cubic yards of salable (common variety) mineral material by the Forest and other government agencies and 340 projects utilizing 136 cubic yards of salable mineral materials by the public.

Conclusion

In conclusion, based on overall forest condition, review of the 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 non-significant amendments will be made as the need arises. The Mt. Hood Forest Plan is currently scheduled for revision beginning in 2009 following the 2005 Planning Rule.

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 in an effort to receive consideration in the budget and program of work processes. These issues highlight priority for sustainability and influences across ecological, economic and social systems that are relevant to Mt. Hood National Forest.

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

Increasing population growth and urbanization, as well as changing demographics with 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. Additionally, a growing concern about biodiversity, species management and protection, and municipal water use has surfaced. This affects the Forest’s capacity to provide goods and services, and shifts environmental impacts. Examples include:

Summary

- With the decline of timber harvest, less than half of a percent of the land base is being treated to meet various objectives. As a result, the Forest is unable to provide a predictable supply of timber or forest products (Christmas trees, firewood, and high quality boughs), and transitory range and forage habitat are becoming limited. Also, funds generated by timber sales for habitat improvement, road maintenance and construction projects have substantially declined.
- With the increase in recreational demands, the Forest is finding resource and social impacts from dispersed recreational use (such as off-highway vehicles, 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 changing recreation pressures. Also, the current recreational user preferences are not meshing with the distribution and configuration of existing developed recreation facilities.

Such shifts in resource use require the Forest to explore new strategies, opportunities and funding sources to address these changes and to continue to provide for customer needs while maintaining healthy ecological conditions. Management decisions need to incorporate a balance between social, economic and ecological considerations.

Role of the Mt. Hood on the Larger Landscape

The Mt. Hood National Forest provides unique properties (like the mountain) and contributes to species habitat in the larger landscape which spans multiple ownerships and jurisdictions. Examples include:

- Given the predominance of federal lands in the river basins of the Mt. Hood National Forest, the role of these lands is critical in providing the “anchor” habitat for fish, wildlife and unique plant populations as well as protecting water quality and long-term production and flows from the watersheds. Management focus is shifting towards larger system assessments.
- Increased urbanization and growing recreational demands on the Mt. Hood National Forest require a new model for collaborative discussions to foster relationships, understanding and trust to help form the basis for addressing recreational conflicts, forge a common vision, and develop partnerships. Mt. Hood National Forest’s unique natural properties, landscape, and proximity to the Portland metropolitan area contribute to meeting the regional and local recreational demands.

This requires the Forest to shift into larger system assessments, 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 wildfire risk, and restoring and maintaining healthy ecological conditions on high priority areas. This includes management of insects, disease, and invasive species, and restoration of biological diversity with a primary focus on fuel reduction. Priority areas for restoration work should include those areas where communities and ecosystems (ecologically sensitive areas) are at risk. This would require the Forest to continue to improve its ability to assess and actively address fuel conditions, fire hazards, potential fire effects, insect and disease risk, and the Forest Service's capabilities and resources to implement work.

Invasive Plants

Approximately 3,000 acres have been documented as infested with invasive plants on the Mt. Hood National Forest. This vastly underestimates the total area because only targeted weeds are monitored and the Forest does not have the financial resources to conduct a thorough survey. Invasive (non-native) 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. Invasives pose unsustainable social, economic, and ecological impacts. Scientists estimate that invasive plants 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. Building our understanding and awareness of the extent of this growing threat on the Mt. Hood National Forest would require improving effectiveness through data management capabilities; expanding partnerships; increasing applied technology and research transfer; improving collaboration and coordination both internally and externally; increasing budgets; and emphasizing prevention measures across all agency activities.

Summary

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

Element	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06	Recommendations/ Comments
♦ Fire Management												
Human caused fires	43	27	32	45	40	54	41	58	24	35	55	Continue monitoring, management direction achieved
Natural occurring	2	9	38	22	1	24	14	11	10	9	38	
Total fires suppressed	45	36	70	67	41	78	55	69	34	44	93	
♦ Air Quality												
Acres treated by prescribed fire	2,448	1,082	1,643	2,161	2,258	1,563	650	1,574	1,647	1,554	1,213	Continue monitoring, management direction achieved
♦ Geologic Resources												
Created openings on mapped earthflows	19	7	0	3	11	8	1	0	0	8	6	Continue monitoring
Created openings on mapped landslides	2	0	0	1	0	0	2	0	0	0	0	
♦ Mineral Resources												
Mineral material used by other agencies (cy)	191,850	25,500	216,700	76,200	85,000	63,500	0	0	0	450	3,000	Complete development plan
Mineral material used by MTH(cy)	13,300	151,800	52,900	56,800	20,375	17,270	7,400	9,400	13,000	21,000	4,700	Find additional source of loose material
Mineral material sold to public(cy)	1,600	865	1,160	350	319	248	474	435	774	424	136	
♦ Transportation/Roads												
Miles constructed/ Forest Plan projection	0.6/ 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/ 16.5	No report done in 2004	0/ 16.5	0/16.5	Adjust Forest Plan
Miles reconstructed/ Forest Plan projection	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	0/ 91.5		0/ 91.5	0/91.5	Adjust Forest Plan
Road miles obliterated	38.9	84.2	27	89	18	4	2.8	18		0	0	
♦ Recreation Resources												
Miles trail constructed/ projections	0/ 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	3.5 6.6	0/6.6	Continue monitoring
Miles trail re-constructed/ projections	21/ 30.5	14.8/ 30.5	14.8/ 30.5	63/ 30.5	12.7/ 30.5	0/ 30.5	2.2/ 30.5	0/ 30.5	0/ 30.5	0/ 30.5	8.8/30.5	Continue monitoring
♦ Timber Resources												
% timber offered of Forest Plan Allowable Sale Quantity	34	39	35	25	0	4.7	15.6	21	3	11.6	14.8	Initiate Forest Plan adjustment
% of PSQ target offered for sale	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 mmbf	40/ 25.4 mmbf	8/ 5.3 mmbf	34.6/ 22.2 mmbf	43.6/21.9	
Silviculture acres treated (harvest methods)	1,685	1,948	3,344	3,044	3,245	808	620	1,029	917	2,526	2,083	Continue monitoring
Silviculture activities (Ac.) (planting, fertilizer, etc.)	9,852	6,172	7,589	5,282	3,750	7,010	6,659	2,094	1,924	380	4,824	Continue monitoring
♦ Financial Resources												
Full Plan implement budget/actual expense (\$)	65.3MM 30.4MM	65.3MM 38.2MM	65.3MM 33.7MM	65.3 MM 39/5 MM	65.3 MM 24.7 MM	63.5 MM 25.6 MM	63.5 MM 23.2 MM	63.5 MM 17.97 MM	63.5 MM 19.4 MM	65.3 MM 16.4 MM	72.1 MM 19.9 MM	

Chapter 1
Introduction

Chapter 1

Introduction

The Mt. Hood National Forest (the 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 the Forest. The goal is to work with partners in finding an appropriate balance between sustainable social, economic, and ecological systems. The intent is to satisfy the values of the present without compromising the needs of future generations.

The Land and Resource Management Plan for the Mt. Hood National Forest (Forest Plan) as amended in 1994 by the Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (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 sixteenth 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. The Northwest Forest Plan identifies land allocations and management direction to respond to the underlying needs of managing substantial parts of these forests for late-successional and old-growth conditions, for a predictable and long-term supply of timber.

A part of implementing the Forest Plan involves a commitment to monitor and evaluate how well the Forest is 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 the 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 the Forest Service to fulfill its responsibilities as stewards of the land. The year's activities are not complete unless the Forest Service monitors 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 the Forest moves into the second decade since the adoption of the Forest Plan in 1991, the Forest is 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 Forest in financial terms.

Chapter 4 – Forest Plan Amendments/Interpretation Process

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.

A review of the plan was made ten years ago in an effort to determine if major changes had taken place to cause a significant amendment or revision to the Forest 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 the Forest Plan in 1994, no further significant revision was needed at that time. The current schedule calls for revision of the Forest Plan to begin in 2009, under the 2005 Planning Rule.

Chapter 2

Accomplishments/Results/ Recommendations

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 Plan.

The 2006 Fire Season

The March snow pack for the 2005–2006 winter season was 130% to 150% of normal. The precipitation summary for the period October 2005 through May 2006 showed 110% to 129% of average. At the first of May, the Palmer Drought Index indicated near normal conditions in this area. At the first of September, the Drought Index was showing Severe Drought conditions in the western portion of the state.

A total of 93 fires were reported in 2006: 38 lightning and 55 human-caused fires. Reported burned acres totaled 2,796. The majority of these acres occurred in two fires, the 790-acre Blister fire and the 1,850-acre Bluegrass fire.

The Bluegrass fire was part of the Mt. Hood Complex of fires. The Mt. Hood Complex contained 13 separate fires ignited by lightning on the same date. No industrial operations fires occurred in 2006. The Forest was successful in supporting the National fire fighting efforts, dispatching a total of 128 personnel to other Regional and National assignments.

Monitoring Activities and Evaluation

The Forest Plan identified fire protection and fuel treatment objectives to be monitored and evaluated to determine fire management’s capability to attain other land and resource management objectives. For each objective, information is collected annually and the results are reported annually or every five years.

Fire Protection Objectives Monitored

Two fire protection objectives are monitored in relation to levels considered in the Forest Plan. They relate to the number of human-caused wildfires and the number of, size and intensity of wildfires based on five 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 56 fires per year and an estimated average annual acreage burned by wildfire of 408 acres (Forest Plan, Chapter 4, p. 25) based on five years of data. For the period 2002 to 2006, the average was 43 fires per year

and 96 acres per year burned. These numbers are for human caused fires only and are below the break points of 56 fires per year and 408 acres established in the Forest Plan. The average number of fires and acres per year for all causes for the last five years are 59 fires per year and 649 acres per year burned. Table 2-1 displays the number of fires and acres by cause.

Table 2-1. Fire Causes and Acres FY 2002-2006.

Cause	Number	Percent	Acres	Percent
Lightning	82	27.8	2764	85
Equipment Use	2	.67	8.1	.24
Smoking	16	5.4	4.5	.13
Campfire	139	47.1	46	1.4
Debris Burning	4	1.3	.8	.02
Railroad	0	0	0	0
Arson	17	5.7	29	.9
Children	1	.53	.9	.31
Unknown	34	11.5	391	12.0
Total	295	100	3244	100

Another area of concern is the number of, size of, and intensity of wildfires and whether they are within the levels considered in the Forest Plan. Table 2-2 displays acres by size class and Fire Intensity Level. Total acres burned increased by 2,390 acres from the previous five-year period (2001-2005). Also, the number of fires increased by 14 fires for the five-year period. This large increase in acres is a result of the August 2006 Blister and Mt. Hood Complex of fires.

Table 2-2. Summary of Wildfires – Acres Burned by Size Class FY 2002-2006.

Size Class Fires (Acres)	Number of Acres Burned by Intensity Level							Total
	1	2	3	4	5	6	7	
A (<0.25)	20	.6	0	0	0	0	0	20
B (1.26-9)	23	13	3	0	0	0	0	40
C (10-99)	80	40	25	0	0	0	0	145
D (100-200)	0	790	0	0	370	0	0	1160
E (+200)	1850	0	0	0	0	0	0	1850
Total	1973	844	28	0	370	0	0	3215

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 Plan standard.

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 forest health within fire-prone areas. The forest had projected to treat 800 acres annually of hazardous fuels. The 10-Year Comprehensive Strategy Implementation Plan will provide the appropriate performance measures to determine success of fuel treatments.

For the reporting period, there were 1,560 acres planned for hazardous fuels treatment. The Forest accomplished 2,032 acres. Of the total acres, 1,827 were in the Wildland Urban Interface and Fire Regime 1.

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 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 wildland attributes, viewsheds, 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 reduce air quality impacts;
- Increase public education and understanding for the importance of implementing hazardous fuel risk reduction activities on both Federal and private lands; and,
- 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.

Air Quality

Goal

The overall goal is to support State and national goals to improve air quality on the Forest and within the region.

Monitoring Activities and Evaluation

Monitoring activities include monitoring prescribed fire emissions and criteria pollutants, including their deposition and effects on visibility, precipitation chemistry, and forest ecosystems. Fire management activities must meet State Implementation Plan (SIP) requirements for particulate emissions and visibility as well as Forest Plan Standards and Guidelines. In addition, public health and environmental quality considerations will be incorporated into fire management activities.

The Clean Air Act established National Ambient Air Quality Standards for criteria pollutants (i.e., sulfur dioxide, nitrogen dioxide, ozone, carbon monoxide, lead, and particulate matter < 10 um and < 2.5 um). Criteria pollutants are monitored for the purpose of helping forest managers ensure permits for new sources will not cause significant deterioration of air quality in Class I areas, such as the Mt. Hood Wilderness. The New Source Review provision of the Clean Air Act provides the process and assigns responsibilities to federal land managers for this determination.

The Forest Service Air Resource Management Program, in collaboration with the National Park Service and other agencies, maintains two instrumented networks: the National Atmospheric Deposition Program (NADP) (which monitors acidity and chemistry of precipitation) and the Interagency Monitoring for Protected Visual Environments Program (IMPROVE) (which monitors visibility impairments in Class I airsheds, such as national parks, wildernesses and wildlife refuges). NADP data is accessible from <http://nadp.sws.uiuc.edu> and IMPROVE data can be accessed at <http://vista.cira.colostate.edu/improve>. In addition, the Forest Service Pacific Northwest Region, in collaboration with the Forest Inventory Analysis-Forest Health Monitoring (FIA-FHM) Program, has created a biomonitoring network. This network consists of approximately 2,500 forested sites in Oregon and Washington, primarily on the 5.4 km FIA grid of permanently marked inventory plots, for detecting and quantifying ecological effects from air pollution and climate change. About 1,500 sites are in western Oregon and Washington. There are 152 biomonitoring sites on Mt. Hood National Forest including 11 sites in Mt. Hood Wilderness, a Class I area. Lichens are the primary indicator in the biomonitoring network. Air quality is assessed at each site using lichen community composition and pollutants loads of nitrogen, sulfur, lead and other toxic metals. Monitoring data is accessible at the Northwest Region Air Resource Management website <http://gis.nacse.org/lichenair>.

Prescribed Fire Emissions

The goal of the Forest Plan is to reduce emissions by 63% by the end of the first decade of the Plan, and that is being achieved to date. The management activities that affect air quality by the Forest remained in compliance throughout the monitoring period (10/05 to 9/06). 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 1,213 acres were treated during the course of the period with a total of 5,688 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 2006.

Burn Type	Acres Treated by Area		Totals
	Eastside	Westside	
Piles	807	145	952
Underburn	261	0	261
Total Acres	1068	145	1213
Tons Consumed	4716	972	5688

Air Pollutants

Air pollutants of most ecological concern to the Forest are nitrogen oxides (NO_x), sulfur dioxide (SO₂), and ammonia (NH₃) and their secondary reaction products, which are ozone, nitrates, nitrites, ammonium ions, sulfates, nitric acid and sulfuric acid. Large additions of nitrogen from vehicle exhaust, industry, and agriculture cause eutrophication of aquatic and terrestrial

system with adverse effects to water quality, fish, aquatic communities, altered soil chemistry and reduced tree growth rates.

Four pollutants with high potential to cause adverse ecological effects are monitored:

- nitrogen,
- sulfur,
- lead, and
- mercury.

Initial surveys and chemical analyses were made in 1994-1997, and re-measurements of previously surveyed sites were made in 2004 and 2005. Lichen identifications and laboratory analyses from 2005 field work are still in process.

Nitrogen-containing Air Pollutants

Between 1994 and 2004, the Columbia River Gorge and the northern boundary of the Forest have experience substantial increases (25-40%) in nitrogen deposition as detected by lichen nitrogen content and collaborated by NADP wet deposition at the Bull Run. The increase is related to increasing population or agricultural influences. No change in lichen nitrogen was detected at sites in the Mt. Hood Wilderness, which has been far enough away from sources and high enough in elevation to be unaffected by regional increases in nitrogen. Analysis of lichen community data from 10-year re-measurements, to be performed later in 2007, will indicate whether or not increasing nitrogen deposition at the boundaries of the Forest is having detectable ecological effects on the presence or abundance of sensitive species.

Sulfur-containing Air Pollutants

There were no significant changes in sulfur concentrations in lichens or in sulfates in wet deposition. Lichen monitoring indicates that the eastern part of the Forest, Columbia River Gorge corridor, and the western boundaries continue to experience the elevated levels of sulfur deposition, which is primarily resulting from agriculture (in the east) and traffic and pollution funneling through the Columbia River Gorge and the Portland metropolitan area (in the west). On the Mt. Hood Wilderness, sulfur levels in lichens were within expected ranges for background sites.

Lead Pollution

Regionally and nationally, lead deposition has decreased significantly over the past ten years, primarily due to the removal of leaded gasoline from the nation's fuel supply. Lead levels in the Mt. Hood Wilderness and nearly all sites on the Forest continued to be within background ranges.

Mercury Pollution

In the Pacific Northwest and elsewhere, mercury is primarily emitted during coal combustion. In 2006, lichen samples from the Forest, the Columbia River Gorge and six other National Forests were submitted. Results should be available in late spring 2007.

Recommendations

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.

Range Management

Goal

The goal is to provide forage for use by permitted domestic livestock on lands determined as suitable and capable of producing range vegetation and within constraints imposed by Forest Plan Standards and Guides.

Existing Condition

Approximately 155,625 acres, or 15% of total acres on the Forest, comprise five active grazing allotments. Vegetative composition within these allotments is a mosaic of grass and shrub lands, meadow complexes, timbered areas, and harvested timber lands. Harvested lands in these allotments generally produce forage for about twenty to thirty years before the trees re-grow and again dominate the site. This is called “transitory range”.

Economic goods and services are provided to communities through the issuance of grazing permits to six local ranchers. A stable supply of summer forage on 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 (i.e., 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. Permittees are responsible for meeting the Terms and Conditions specified in these permits; and
3. If a permittee does not comply with the Terms and Conditions, permit action may be taken against their permit which may involve anything from temporary partial suspension to permit cancellation.

- *Are Forest Plan objectives for range being met?*

In the 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 1,671 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 within grazing allotments is related to vegetation health. Studies to monitor existing condition and long-term trend in vegetation are in place on all allotments using photo trend methodologies. These methodologies are currently being evaluated for their effectiveness at meeting these objectives, per Region 6 direction in the “Rangeland Ecosystem Analysis and Monitoring Handbook” (FSH 2209.21). Once a methodology is selected, the protocol typically requires that permanent plots are established and monitored once every five to seven years to record plant species diversity, percent bare soil, plant vigor and other factors, which in turn can illustrate trend and/or 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 active allotments. These studies are used to monitor the consumption of the current years forage by both permitted livestock and wildlife. Of the twenty-seven established monitoring sites, which are visited annually, nineteen are located within riparian areas. Of those 19 sites, 95% (18 sites) met Forest Plan Standards and Guidelines for forage utilization, while 5% (1 site) did not. The remaining eight sites are located within the uplands, and 100% (8 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, one 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 Forest Resources and Timber Supply 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 National Environmental Policy Act (NEPA) process as the Forest Service proceeds with updating allotment management plans in order to allow appropriate resource decisions to be made.

A productive, long-term partnership with a riparian restoration objective 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 it will continue.

Noxious Weeds

Noxious weeds or invasive plants are monitored because they displace native vegetation, alter species composition of vegetation on forest and range lands, reduce the productivity of desired commodities on National Forest System lands, 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 how best to allocate financial and personnel resources. Monitoring weed infestations provides us with important information on their impact (e.g., location, acres infested, and rate of spread) 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 will prevent a large costly effort in the future.

Goal

To prevent new infestations and control the spread of existing noxious weeds in accordance with the Mt. Hood National Forest Noxious Weed Plan, the *Final Environmental Impact Statement (FEIS) and Record of Decision (ROD) for Preventing and Managing Invasive Plants in the Pacific Northwest Region* (October 2005), and the Forest Plan.

Existing Program

The primary goal is accomplished through a combination of efforts including prevention, education, inventory, treatment, and monitoring.

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

The Forest also participates and coordinates with the recently formed Garlic Mustard working group, the Columbia Gorge Cooperative Weed Management Area (CGCWMA), the Four County CWMA, and the Wasco County Weed Board. These groups are made up of many different cities, counties, state agencies, landowners, and interested citizens to coordinate our weed education and control efforts across multiple ownerships.

In 2006, the Forest entered into a five year challenge cost-share agreement with The Nature Conservancy (TNC) to conduct inventories for knotweed (*Polygonum spp.*) in several drainages on the Forest. TNC also treated known infestations on adjacent private lands in the Sandy River Basin using stem injection methods. See <http://tncweeds.ucdavis.edu> for more information.

Education is a critical element of invasive species management. In 2006, a hawkweed education/identification sign was placed at the Pacific Crest trailhead to the Mt. Hood and Hatfield Wilderness areas. Four thousand interpretive postcards have been printed for distribution in 2007 at trailheads along Lolo Pass, requesting that trail users report suspected non-native hawkweed sightings.

Treatment efforts were focused on the control of diffuse knapweed (*Centaurea diffusa*), hound’s tongue (*Cynoglossum officinale*), common toadflax (*Linaria vulgare*), and tansy ragwort (*Senecio jacobaea*) east of the crest of the Cascade Range. This was accomplished under an Agreement with Wasco County. The County treated 52 sites, including roadsides, rock quarries, and other previously disturbed sites. West of the Cascade crest, diffuse and spotted knapweeds and non-native hawkweeds (*Hieracium aurantiacum* and *H. pratense*) were treated. This was accomplished under an Agreement with Oregon Department of Agriculture (ODA). ODA treated nine established sites plus 20 roadside sites and monitored six sites, which were previously treated and no weeds were found during the 2006 visit.

Table 2-4. Acres of Noxious Weed Treatment in FY 2006.

	Acres Treated by Method
Chemical	390
Manual & Mechanical	35
Biological	0
Fire	0
Total	425

Monitoring Questions

- Are known untreated weed sites continuing to spread?

Yes. Of concern are invasive non-native Yellow and Orange Hawkweed (*Hieracium aurantiacum* and *Hieracium floribundum*). Satellite populations have been detected up to ten miles from the one main population on Zigzag Ranger District.

Japanese knotweed (*Polygonum cuspidatum*), giant knotweed (*Polygonum sachalinense*), and hybrid bohemian knotweed (*Polygonum X. bohemicum*) populations in the Sandy, Zigzag, and Clackamas River drainages also appear to be increasing.

Both hawkweed and knotweed form dense populations, displacing native plants. There is great concern that if any of the non-native hawkweeds become 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 the Forest. 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 elk populations.

Rare plants (Region 6 Sensitive) that are associated with meadow habitats are also at risk from encroachment of non-native hawkweed species. 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. The corridor provides habitat where hawkweed thrives.

Knotweed forms aggressive, dense stands six to eight feet tall along streams, displacing native vegetation and degrading habitat for riparian-associated birds, mollusks, fish, insects, and mammals. Knotweed has a weak root system and does not bind the soil well like native riparian vegetation, leading to increased erosion during peak stream flows in the spring. There is also concern that knotweed can change nutrient input to streams, further affecting aquatic organisms. The result may be degraded fish habitat in important anadromous fish-bearing streams.

Currently, known sites for Japanese knotweed are at lower elevations along the Salmon River, Still Creek, and Bear Creek on the Zigzag Ranger District and at the Timber Lake Job Corps site in the Clackamas River drainage. Knotweed populations are also located in the summer home tracts in the vicinity of Zigzag and Rhododendron. The only treatment method presently available to the Forest is manual cutting. According to a species management summary by The Nature Conservancy, manual cutting of knotweed can weaken food reserves stored in the plant's rhizomes. Repeated cutting (recommended three times per year) may weaken the ability of knotweed plants to survive and to resprout from rhizomes. Digging out the

plant is not recommended since this may spread rhizomes and root fragments and thereby spread the plant. The only control method known to be effective against knotweed is herbicide application (stem-injecting or foliar-spraying glyphosate or triclopyr). The Nature Conservancy is treating knotweed with glyphosate and triclopyr on private land in the Sandy River basin, but this option (herbicide application) will not be available to the Forest until the recently prepared invasive plant Environmental Impact Statement (EIS) has been authorized (scheduled for approval in Fall 2007).

- *Are new infestations occurring?*

Yes. A previously unknown population of false brome (*Brachypodium sylvaticum*) was detected in FY 2006 in the Collowash drainage on Clackamas River Ranger District. The estimated infestation size is a quarter of an acre. A new invader, Garlic Mustard (*Alliaria petiolata*), which has established itself in parts of the Columbia River Gorge and some Portland parks, has the potential to spread onto the Forest and is being closely watched. Orange hawkweed was recently found in a small meadow on the west side of the Mt. Hood Wilderness area.

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

Some widespread weed species that have established biological control agents, such as Scot's (or 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, however, have had modest impact thus far. No biological controls have been approved for houndstongue, 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. Mitigation efforts are effective in preventing the introduction of noxious weeds into areas not yet infested. Greater emphasis has been placed on disposal of weed-contaminated material from roadside clearing and 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 backcountry horse use where weed-free hay and straw are 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 houndstongue and tansy ragwort sites east of the crest of the Cascade Range; knapweed sites on Barlow, Clackamas River, and Zigzag Ranger Districts; and hawkweed on Zigzag Ranger District. These treatments have been effective in reducing the number of plants; however, plants germinating from seed already deposited in the soil will need treatment in future years until the seed bank is depleted. The weeds are so widely established east of the crest of the Cascade Range that eradication may not be 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 populations 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.

Rock sources and storage sites on the Barlow Ranger 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.

Knotweed sites associated with summer homes on the Zigzag Ranger District were hand pulled. The experience of others and the literature suggest that this method will not result in controlling or eradicating knotweed; however, at this time it is the only control method available to the Forest. The Forest is currently preparing a noxious weed Environmental Impact Statement (EIS) on herbicide use to control noxious weeds. Knotweed can be controlled by stem-injection of glyphosate, a method used by The Nature Conservancy to treat knotweed populations along river corridors in northwest Oregon.

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 the Bonneville Power Administration to treat the primary hawkweed infestation within the Big Eddy-Ostrander power transmission corridor.
- Watch for new infestations of Garlic Mustard and satellite populations of Knotweed. Treat with “Early detection rapid response” strategy as soon as the Mt. Hood sub-regional invasive species EIS is finished.
- Continue Agreements with Wasco County, TNC and ODA to treat weeds. Identify potential sources of funding, since it is unlikely that the Title II Payments to Counties Act will be funded in 2007, which has been a primary source of treatment funding since 2002.
- Knotweeds are 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 following a project to determine their effectiveness.
- Continue to work with Oregon Department of Agriculture to establish biological controls on the Forest.
- Monitor Forest activities to ensure that standards outlined by the Regional Forester in the Record of Decision for invasive plant management are being fully implemented.
- Continue hawkweed environmental education efforts along Lolo Pass by establishing additional interpretive signs at all trailheads that are accessible from the Lolo Pass Road and intersecting roads.

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 System lands, and that appropriate coordinating activities are occurring.

Monitoring Questions

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 scoping, the Forest has developed and maintains informal contacts with the CTWS.

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). The following preservation projects were undertaken during FY 2006:

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 under plan stipulations during FY 2006 in consultation with the State Historic Preservation Officer (SHPO).

Table 2-5. Approved Projects at Timberline Lodge.

Project No.	Description	Finding
2006-060609-015	Lynch Panel	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C. b.
2006-060609-037	Pool Fence	Within Timberline Lodge Agreement. No Adverse Effect. Stipulation III.C.3b.

Cloud Cap – Tilly Jane National Historic District

Historic preservation efforts within the Tilly Jane National Historic District during 2006 focused on emergency measures to protect buildings from wildfire. In August 2006, the Mt. Hood Complex fire, 1,859 acres in size, threatened the historic district. Flammable materials were cleared away from several buildings, and the historic Cloud Cap Inn (1889) was wrapped with protective fire shelter fabric. Hose lines were installed around other buildings, and liquid fire retardant was stockpiled at the site for use. Effective suppression and favorable weather conditions prevented spread of the fire into the historic district.

A plan for rehabilitation of the east wing of Cloud Cap Inn was completed and submitted to the Oregon SHPO for review and approval in 2006. The plan was prepared in partnership with KPFF Consulting Engineers, and with the guidance of the Deputy SHPO.

Bagby Guard Station

Built in 1913 to serve as headquarters for the Bagby District, Bagby Guard Station consists of a rustic log cabin and associated storehouse associated with a popular hot springs. The property is listed in the National Register of Historic Places. In partnership with Northwest Forest Conservancy (NFC), a private, non-profit organization, the Forest executed a Memorandum of Understanding in 2006 for historic preservation activities involving the guard station. Under contract to NFC, a professional consultant completed an assessment of preservation needs.

NFC began implementation of the first phase of treatments, repair, and rehabilitation work in 2006. In consultation with SHPO, a “No Effect” (“No Historic Properties Affected”) determination was made for the proposed project work.

3. Nominations to the National Register of Historic Places

The last nomination was for Bagby Guard Station, listed in the National Register of Historic Places in September 1999.

In consultation with the State Historic Preservation Office, the Forest evaluated a large number of historic resources for National Register eligibility during FY 2006. These included the Vine Maple Recreation Residence Tract, consisting of 85 privately-owned cabins under permit to the Forest Service; the Zigzag Recreation Residence Tract, consisting of seven cabins; the Zigzag Ski Club Recreation Residence Tract, consisting of seven cabins; and the Flag Mountain Recreation Residence Tract, consisting of 40 cabins. The Zigzag Ski Club Tract was determined eligible for inclusion in the National Register of Historic Places as an historic district. While the other tracts were determined not eligible as districts, seven of the privately-owned cabins were determined individually eligible to the National Register.

A Forest Service residence located at the Estacada Work Center was also evaluated for National Register eligibility. Initially built in 1942, the residence was moved from Portland and rebuilt from 1953 to 1954. Due to alterations, the building was determined not eligible to the National Register of Historic Places.

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. Sixteen Oregon Archaeological Society volunteers participated in the archaeological survey and site testing project involving an historic logging camp in Wasco County, contributing over 200 volunteer hours. In September, the Barlow Ranger District hosted an on-site interpretive program on emigrant use of the Barlow Road at White River Station Campground, one of the historic sites within the Barlow Road Historic District. Heritage Program personnel staffed an interactive public archaeology station as a part of the week-long event. Over 500 visitors attended the event.

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.

Northwest Forest Conservancy volunteers contributed more than 250 hours toward restoration and rehabilitation of two historic buildings at the Bagby Guard Station. With funds from the Spirit Mountain Foundation, NFC also designed and printed an interpretive brochure for public distribution.

Conclusions

Avoidance of impacts to heritage resources has been a goal for all projects implemented during FY 2006. 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 FY 2007, 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.
- Expand Site Stewardship Program through partnership with Oregon Archaeological Society including a larger number of sites in the monitoring program.
- Initiate assessments of historic buildings in the Mt. Hood Wilderness and Bull of the Woods Wilderness to determine management goals.

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.

Existing Conditions

There were five timber harvest units in FY 2006 on land mapped as high-risk earthflow. The largest unit was 26 acres. There was one timber harvest unit in FY 2006 on land mapped as moderate risk earthflow. The size of that unit was seven acres. All of the timber harvest units on B8 (earthflow) land were commercial thinnings that temporarily reduced the crown closure to less than 70%. It is estimated that recovery to 70% crown closure will occur in approximately ten years. In all cases, the planned harvest units were reviewed by slope stability specialists and determined to have no measurable effect on earthflow stability. No roads were constructed on B8 (earthflow) land. There were no timber harvest units on mapped landslides other than B8 land in FY 2006. No roads were constructed on mapped landslides other than earthflows.

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 FY 1991.

Continued measurements during FY 2006 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.

Recommendations

Additional efforts in 2007 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.

Minerals

Goal

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

Existing Conditions

There were no commercial leasable or locatable mineral development activities on the Forest in FY 2006. Locatable mineral activities were limited to minor sampling and exploration on the Forest. Two Notice-of-Intents were submitted to the Forest. In all cases, the planned activity was limited to mineral exploration. There were 19 inquiries from the public regarding laws and guidelines covering locatable minerals on National Forest System 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 two projects where 3000 cubic yards of mineral materials were used by other government agencies. There were six projects where a total of 4700 cubic yards of mineral materials were used by the Forest. All of the major projects had operating plans and were field inspected for compliance with the plans. All (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 FY 2006 there were six operating plans completed for current and future projects. One small quarry was closed and restored.

There were 340 smaller projects where salable mineral materials were used by the public. These projects removed a total of 136 cubic yards. Prices for the various rock products available for sale to the public were adjusted in FY 2002 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.

Recommendations

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

Fisheries Program

Goal

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

Monitoring Activities and Evaluation

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 Forest and the important role the Forest provides for the conservation and restoration of aquatic species. The aquatic resources monitoring program is the starting point to track the status of populations of concern, such as the Endangered Species Act (ESA) listed fish; develop long-term data sets on migration and population trends; and for conducting effectiveness monitoring for restoration projects designed for habitat recovery and long-term sustainability of fish populations.

Forest Plan Standards and Guidelines, as amended by the Northwest Forest Plan, were designed to maintain or enhance aquatic habitat complexity and fish habitat capability. Watershed scale (fourth field, such as the Sandy River Basin; and fifth field, such as the Salmon River) monitoring is completed through two programs:

- the Mt. Hood Stream Inventory Program, and
- the Aquatic and Riparian Effectiveness Monitoring Program.

Ecological Integrity – Ecosystem Function

Stream Function and Conditions

Stream Inventory Program

The Mt. Hood Stream Inventory Program (see Table 2-6) collects information on stream conditions, including habitat typing (e.g., pools, riffles, glides), riparian and upland vegetation, management activities near the stream, streambed composition, and fish species presence. Each year, fish biologists on the Forest evaluate monitoring and information needs, such as project level planning or updating a Watershed Analysis document, and choose the streams to be inventoried.

In 2006, the Mt. Hood National Forest Stream Inventory program expanded to form a provincial program including the Gifford Pinchot National Forest and Columbia River Gorge National Scenic Area. Surveys are then compiled into reports. The reports give fish biologists a current year snapshot of conditions and, over time, a tool to evaluate trends and determine if the Forest is meeting aquatic habitat standards and guidelines.

Table 2-6. FY 2006 Aquatic Inventory Program.

Stream Name	Aquatic Inventory (in Miles)	Aquatic Biota (in miles)
Clear Creek	7.1	7.1
Elk Creek	5.1	5.1
Middle Fork Hood River	5.0	0
Little Zigzag River		1.6
Boulder Creek		4.8
Cheaney Creek		3.6
Jones Creek		2.3
Robinhood Creek		2.5
Bear Creek		3.7
Tony Creek		4.5
Total	17.2	35.2

Aquatic and Riparian Effectiveness Monitoring Program

The Aquatic and Riparian Effectiveness Monitoring Program (AREMP) is a multi-federal agency program developed to assess the effectiveness of the Aquatic Conservation Strategy (ACS) of the Northwest Forest Plan. The objective of the ACS is to maintain or restore the condition of watersheds in the Northwest Forest Plan area. The AREMP program is sampling ten sixth field watersheds on the Forest. In 2006, sampling included High Rock Creek (HUC 170900111304) and Cub Creek (HUC 170900110201) on the Clackamas River Ranger District. Watersheds are sampled each year over a five-year rotation. Models evaluating the data are still under refinement. Information regarding the AREMP program is found at www.reo.gov/monitoring/watershed.

Special Habitats

Fisheries special habitats are habitats that provide a critical function during a certain life stage or time of the year, for example, off-channel rearing areas for juvenile salmonids during winter storm flows. In the Sandy River Basin, the Forest has actively pursued restoration of special habitats on both federal and private lands.

The Upper Salmon Side Channel Project (phase 2) focuses exclusively on restoring side-channels and off-channel habitat in the Salmon River Watershed, both on public and private lands. The project also includes a conservation education component to highlight the collaborative partnership work and ecological improvements (including salmon ecology, watershed restoration and stewardship) that are occurring within the Sandy River Basin.

In 2006, the Zigzag Ranger District continued maintenance on high-value, side-channel habitats totaling 0.5 miles in length. In addition, the Sandy River Basin Watershed Council and the Wilderness Volunteers completed riparian plantings on one acre after the heavy equipment work was completed.

Ecological Integrity - Population Function, Structure and Composition

Population Viability

Anadromous fish have a complex life history, which includes freshwater, migration and saltwater phases. Monitoring information is used to better understand life history stages of different populations, and focus recovery efforts for listed ESA fish. 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 government, non-government and Tribal partners, monitor fish production in each basin. The actual utilization of habitat by various fish species is far below the overall productive capacity of rivers and streams on the Forest.

Monitoring of smolt production occurs in the Clackamas and Sandy River Basin. In the Sandy River Basin, salmonid populations and structure has been monitored for the past 14 years. Each year, juvenile and ocean going smolt populations are monitored in the Sandy River using smolt traps at the Still Creek site (ongoing since 1992), the Clear Fork of the Sandy River (ongoing since 2002) and the Salmon River (began in 2004).

The overall abundance of anadromous fish and bull trout are low in the streams and rivers monitored. In 2006, the Oregon Department of Fish and Wildlife led an effort to update the status of bull trout in the Hood River system. Results were discouraging. A bull trout population was estimated at 513 (plus or minus 61%) adults and juveniles on Clear Branch Hood River (located on the Forest). Only four fish were captured greater than 200 mm in length. Preliminary results predict less than 100 bull trout adults in the Hood River Basin. Below the Laurance Lake Dam significantly fewer fish were captured. Also captured was a 370 mm smallmouth bass, an invasive species that could be significantly impacting bull trout in Laurance Lake.

Salmon populations on the Forest continue to show large fluctuations in size. The most extensive and complete data set on the Forest is in the Clackamas River, where up to eight smolt trap sites have been monitored annually. The 12-year data set has shown general trends of increasing numbers of steelhead smolts, and decreasing numbers of coho smolts.

Invasive Aquatic Species

Non-native, invasive fish species, such as brook trout and small-mouth bass, have been documented on the Forest. Fisheries biologists have developed a long-term monitoring plan for the ESA listed bull trout, which includes an assessment of impacts and interactions of small mouth bass and bull trout. For other non-native, invasive species, biologists continue to monitor changes in their distribution.

Table 2-7. FY 2006 Broad Scale Monitoring Programs Listed by Fourth Field Watershed Which Track Long-term Trends of Aquatic Species and Their Habitats on the Mt. Hood National Forest

Fourth Field Basin Name	Project Name	Objective
Clackamas River	Smolt trapping and population estimates of coho and steelhead in Fish Creek, Oak Grove Fork, Roaring River, North Fork Clackamas, Eagle Creek, Clear Creek and Deep Creek	Long-term population monitoring of out-migrating salmon and steelhead smolts
	Salmon Carcass Nutrient Restoration	Nutrient level and biological response to salmon carcass additions
Hood River	Bull Trout Population Monitoring	Establish and document changes in bull trout populations
Fifteenmile/White River	Spawning Surveys	Long-term monitoring of spawning success and trends
	Fifteenmile Riverkeeper	Monitor response to large-scale watershed restoration
Sandy River	Spawning Surveys	Long-term monitoring of spawning success and trends
	Smolt trapping and population estimates of coho and steelhead in Still Creek, Clear Fork and Salmon River	Long-term population monitoring of out-migrating salmon and steelhead smolts
	Salmon Carcass Nutrient Restoration	Nutrient level and biological response to salmon carcass additions

2006 Monitoring Report

Fish Populations of Concern

In 2005, critical habitat for the Lower Columbia steelhead and chinook was designated.

Table 2-8. Fish Populations of Concern on the Mt. Hood National Forest

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

Social Well-Being – Collaborative Stewardship

Collaboration and Partnerships

As an urban forest, nearby cities and their inhabitants have a profound influence on management of the Forest. Dedicated citizens, conservation groups, schools, and local governments and agencies all play important roles as partners.

Basin-wide Aquatic Habitat Restoration Strategies

In 2006, two collaborative working groups completed two basin-wide aquatic habitat restoration strategies. The purpose is to address aquatic habitat restoration needs for recovery and long-term persistence of fish populations in the basin. Using a holistic watershed view, the strategy is intended to guide investments over the long-term, completing high priority restoration actions in the highest priority watersheds, achieving benefits at the watershed scale. The strategies look at restoring connectivity, long-term physical and biological processes, ecological function of riparian areas, and short-term, in-stream habitat conditions.

Sandy River Basin Aquatic Habitat Restoration Strategy

This anchor habitat-based, aquatic habitat restoration strategy focuses on salmon and steelhead populations in the Sandy River Basin. “Anchor” habitats are those streams or rivers that provide relatively good to excellent aquatic habitat conditions in large watersheds (20-50 mi²). Restoring anchor habitats protects the remaining high quality, productive habitats in a watershed and moves it more readily towards restored condition assuring intact aquatic habitat is maintained over the long-term.

Hood River Basin Aquatic Habitat Restoration Strategy

This aquatic habitat restoration strategy addresses restoration needs for resident and anadromous fish species, while addressing the needs for streamflow and water quality improvements. Five of the six anadromous species populations have been listed under the Endangered Species Act.

The Sandy River Basin Anchor Habitats Project

The Sandy River Basin Anchor Habitats Project continues to lead the integrated systems management fisheries program on the Forest. A consortium of stakeholders from conservation groups and government representatives, concerned about the future of the Sandy River Basin, convened in 1999. A product of their meetings was the “Sandy River Basin Agreement”, which called for a “strategy that is consistent with state and federal efforts to maintain and recover salmonids listed under the ESA (Endangered Species Act) in the Sandy River Watershed.”

In 2004, many of the partners involved in the Sandy River Basin Agreement came together again to identify geographic areas in the Sandy River Basin important for the persistence and restoration of salmon and steelhead populations. These interested stakeholders identified the key areas, known as Anchor Habitats, from which a technically sound and scientifically rigorous strategy for restoring salmon and steelhead habitat.

The stakeholders involved are listed below.

- State of Oregon – Department of Fish & Wildlife
- Clackamas County
- Association of Northwest Steelheaders
- Oregon Trout
- Native Fish Society
- The Nature Conservancy
- Sandy River Basin Watershed Council
- Salem BLM
- US Fish & Wildlife Service
- NOAA Fisheries
- Mt. Hood National Forest
- City of Portland Water Bureau

Conservation Education

The Forest sponsors and participates with partners on several effective conservation education programs and events throughout the year. The following are some examples:

- Oxbow Salmon Festival
- Salmon Watch
- Fishing Clinics
- Salmon Life Cycle Game

Water Resources

Goal

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

Monitoring Activities and Evaluation

Water quality Best Management Practices (BMPs) and related Forest Plan and Northwest Forest Plan Standards have been developed to achieve compliance with the Clean Water Act and state water quality regulations. A Memorandum of Understanding between the Oregon Department of Environmental Quality and the Forest Service recognizes BMPs as the primary mechanism for achieving water quality standards. Water resource monitoring activities are designed to collect data on water quality trends, assess Forest Service's compliance with the Clean Water Act, and monitor the effectiveness of watershed restoration work, such as road decommissioning.

The Northwest Forest Plan prescribed various standards and guidelines for resource management activities, many of which are more stringent than those prescribed in the 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. These widths 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 about 51 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.

Ecological Integrity - Landscape Function, Structure and Composition

Hydrologic Function and Watershed Condition

Hydrologic function and watershed condition, like other landscape function indicators provide us information about the watershed's ability to resist and recover from disturbances and to filter and maintain water quality. Hydrologic condition describes an analysis of watershed characteristics focused on physical and ecological processes affecting the timing, quantity, and quality of stream flow.

Cumulative Watershed Effects Analyses

During 2006, a watershed cumulative effects analysis was completed for the 2007 Plantation Thin and No Whisky Thin Environmental Assessments on the Clackamas River Ranger District using the Aggregate Recovery Percentage (ARP) methodology. On the eastside of the Forest, the ARP was evaluated as part of the Eightmile Salvage and Sportsman's Park Categorical Exclusion assessments. A non-ARP cumulative effects analysis was completed for the Bull Run Road Decommissioning Environmental Assessment on the Zigzag Ranger District.

The watershed cumulative effects analysis for all the above listed projects indicates the post-project ARP would be within the guidelines set forth by Forestwide standard and guidelines FW-063 and FW-064 pertaining to cumulative watershed effects.

Ecological Integrity – Ecosystem Function, Structure and Composition

Water Quality

Healthy forests and wetland systems provide a host of watershed services, including water purification, ground water and surface flow regulation, erosion control, and streambank stabilization. The amount and characteristics of water determine the capacity of ecosystems to sustain forest, forest economies, and forest-dependent societies. Water condition, therefore, serves as an indicator of factors that may lead to impacts on the overall biodiversity of forest ecosystems.

Bull Run Road Decommissioning Monitoring

Forest Service monitoring activities within the Bull Run Watershed focused on monitoring effects on water quality from the Bull Run Road Decommissioning Project and activities related to the decommissioning of roads. The road decommissioning project was completed with a total of 30.3 miles decommissioned during 2000-2004. The project involved removing five third order stream crossings, 19 second order stream crossings, and 52 first order stream crossings. Road decommissioning activities included the removal of stream crossing structures, culverts and a bridge, and the fill materials covering pipes and behind abutments. 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 and the Clean Water Act for turbidity, suspended solids, and temperature. In addition, monitoring would assess potential cumulative effects to water quality from the activity.

Effectiveness monitoring visits were made to the upper 1015 Road to assess how well the applied BMP's functioned. This section of the 1015 Road was decommissioned in 2003 and 2004. Results of this survey indicated that water quality protection measures were functioning as designed for the most part with minimal surface erosion or stream bed and bank erosion noted.



Road 1015105 at Falls Creek, September 2004

In addition, after the November 2006 flood event (estimated to be a 25 year recurrence interval event in the Bull Run River upstream of the reservoirs), helicopter reconnaissance was completed for the entire 1015 and 1015105 roads. Forest Service personnel on the helicopter did not note any problems associated with the decommissioned stream crossings.

Photo monitoring detailing stream crossing at Nanny Creek, West Fork Hickman Creek, Hickman Creek, Log Creek, No Name Creek, and Falls Creek have been completed and are planned to be re-photographed in the summer of 2007.

Water quality sampling was done to evaluate effects to water quality from turbidity. 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. 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.

Trend Monitoring

Trend Monitoring is conducted to monitor water quality (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 Plan, as amended by the Northwest Forest Plan, standards and guidelines are 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 regulatory tools used by the Oregon Department of Environmental Quality (DEQ) and the federal Environmental Protection Agency (EPA) to prevent pollution of waters. States are required to adopt water quality standards by the federal Clean Water Act. States submit their standards to EPA for approval. New and more stringent DEQ water temperature standards went into effect on March 2, 2004.

Stream temperature was measured during the summer and in some cases year-round on 40 sites on the Forest. In most cases, water temperature was recorded every hour with an Onset brand data logger. On the Clackamas River Ranger District, eight out of 13 streams monitored in Fish Creek did not meet the 16.0°C core coldwater habitat standard. On the Hood River Ranger District, three out of nine streams did not meet the 12.0°C bull trout water temperature standard ranging from two to 39 days, while on the Barlow Ranger District four out of 11 streams did not meet the standards ranging from three to 52 days, and all of the 17 streams on the Zigzag Ranger District did not meet either the fish spawning (13.0°C) or core cold water habitat (16.0°C) standard.

As described above, various streams monitored Forest-wide do not meet one or more of the DEQ water temperature standards, even though these same streams in most cases provide very good water quality for fish. A record-setting heat wave affected Oregon and most of the Western U.S. This extremely warm weather may have resulted in some of the streams exceeding the DEQ water temperature standards. There is some uncertainty if the streams that do not meet one or more of these standards would have met these

standards prior to the onset of various resource management activities.

Where past management activities did result in stream shade removal, these areas are rapidly recovering stream shade, which will eventually result in lower water temperatures. The Northwest Forest Plan riparian area management standards direct that riparian reserves be left along streams and reserves during resource management activities, in order to enable maintaining existing stream shade conditions and current water temperatures.

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 four miles downstream of the Forest boundary. The monitoring station was located as close to the Forest boundary as possible, but potential influences on water quality from lands in other ownerships downstream of the 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. Water temperature, pH, and conductivity data is incomplete for 2006 due to a problem with the data sensors. Average monthly water quality data for 2006 are listed in Table 2-9, based on a preliminary analysis of the data.

Table 2-9. Water Year (WY) 2006 Eagle Creek Monthly Water Quality Parameter Averages.

2005 Water Quality Parameters (monthly averages), Eagle Creek				
Month	Turbidity (NTU)	Water Temperature (°F)	pH	Conductivity microsiemens (microS)/cm
January	2.8	42.3	7.5	30.3
February	1.0	38.5	7.6	33.3
March	0.7	40.1	7.6	34.3
April	1.1	error	7.4	error
May	1.4	error	7.4	error
June	0.7	error	7.6	error
July	0.8	error	7.7	error
August	0.1	error	7.4	error
September	0.2	error	error	45.7
October	0.6	error	error	error
November	8.0	error	error	error
December	2.2	40.7	error	31.1

Average turbidity at this monitoring site is relatively low throughout the year, with average values of 2.0 NTUs (Nephelometer Turbidity Units) or less from February through October 2006. The maximum recorded turbidity in 2006 was 294.8 NTUs, during a high flow event (approximately 2.3 year flood) on November 7, 2006. This is a relatively high level of turbidity, but not out of the ordinary considering that significant stream bank and stream channel erosion normally occurs during peak flow events. Small landslides adjacent to or near stream channels can also occur during heavy rainfall events when soils are saturated. 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.

Instream pH values ranged from 7.4 to 7.6 from January through August 2006. These pH values are well within the Oregon DEQ water quality standards (pH range 6.5 to 8.5). Overall, water quality at this monitoring site was very good for much of the year.

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 water left the 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. Data is recorded at 30 minute intervals for date and time of collection, turbidity, water temperature, depth, specific conductivity, and pH. Water quality data is available via telephone at various Forest and Clackamas River water providers' offices. In March 2005, the U.S. Geological Survey (USGS) began operating this monitoring station with funding provided by the Clackamas River water providers.

Table 2-10. Water Year (WY) 2006 Clackamas River (Carter Bridge) Monthly Water Quality Parameter Averages.

Month	WY 2005 Water Quality Parameters (monthly averages), Carter Bridge, Clackamas River				
	Dissolved Oxygen (mg/l)	Turbidity (NTU)	Water Temperature (°F)	pH	Conductivity microS/cm
October	11.0	0.8	49.1	7.8	67
November	12.2	7.5	42.6	7.6	47
December	13.3	22.2	38.2	7.6	46
January	12.8	33.4	41.4	7.4	36
February	13.5	10.3	39.2	7.5	43
March	12.9	1.9	41.4	7.7	49
April	12.1	4.3	44.1	7.7	41
May	11.3	3.7	47.7	7.6	39
June	10.5	1.5	53.2	7.6	49
July	10.3	1.0	57.9	7.6	62
August	10.5	0.6	55.8	7.6	66
September	10.8	0.6	51.3	7.7	65

Average monthly water quality data through September 2006 (end of USGS water year) are listed in Table 2-10 below. Average turbidity at this monitoring site is relatively low throughout the year, with average values of near or less than 2.0 NTUs from January through September 2006. 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 500 NTUs. The maximum recorded turbidity in 2006 was 453 NTUs, during a high flow event on January 11, 2006.

Instream average monthly pH ranged from 7.4 to 7.8, within the DEQ standard (6.5 – 8.5). Daily maximum pH values were also less than 8.5. Instream dissolved oxygen concentrations also met DEQ standards.

The peak water temperature reached about 63.5° F on July 24, 2006. The seven-day average maximum water temperature was approximately 62.2° F on July 25, 2006, slightly exceeding the 60.8° F core coldwater habitat standard. The average water temperature during July was 57.9° F. Overall, water quality is very good at this particular monitoring site on the Clackamas River.

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 twelve 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)

Fish Creek: The Forest funded a telemetered USGS stream gage on Fish Creek (Clackamas River Ranger District), which was discontinued in October, 2006 due to lack of funding. Sometime in the foreseeable future, the 17 years of stream flow data collected at the Fish Creek stream gage will be analyzed to determine if the road decommissioning work resulted in measurable reductions of winter peak streamflows.

Upper Clackamas and Zigzag River: Mt. Hood National Forest watershed staff has re-established a discharge measurement gage at a previously decommissioned USGS gauging station on the Upper Clackamas River at Big Bottom and on the Zigzag River. These sites will also be used to characterize the hydrology of the watershed, and the stream gage on the Zigzag River will serve as an “early warning” indicator for activating road storm patrols on the Zigzag Ranger District.

Still Creek Streamflow: One of the monitoring opportunities and associated data gaps identified during the watershed analysis process was stream flow data on Still Creek. This site was identified as critical due to its association with the smolt trap used to assess salmonid escapement from Still Creek. 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.

Turbidity

Still Creek Turbidity: A continuous turbidity monitoring site was established in upper Still Creek, downstream of the bottom terminal site associated with the Timberline Express ski lift project. This probe was installed and maintained by the USFS. Water levels were measured to determine whether the turbidity values were collected when stream flows were rising or falling. Continuous monitoring of turbidity in Still Creek began prior to construction to collect baseline data, and will continue into the storm season following construction. The data collected from the continuous monitoring will be used to evaluate the effectiveness of erosion and sediment control measures used during construction of the Timberline Express project. During the summer of 2007, field visits will be made to the stream channel and project area above the turbidity monitoring site in order to validate the turbidity data that was collected.

Timberline Ski Area Water Quality Monitoring

The Timberline Ski Area has operated a skiing venue for over forty years at the Palmer snowfield on Mt. Hood. Salt is applied to the Palmer snowfield during summer months to condition the snow surface and maximize its use for skiing. Timberline Ski Area conducts an on-going annual surface water-monitoring program to evaluate any potential effects to downstream surface water from salting on the Palmer snowfield. Their comprehensive environmental monitoring program incorporates surface water quality monitoring, environmental fate assessments, salt composition analyses, and an overall salt management program. The data is supplemented by historical data collected by Timberline from 1988 to 1989 (CH2M Hill)

and from 1990 to 2000 (Golder Associates). The water quality analysis report for water year 2005 was prepared in accordance with the 1996 Salt Management Plan developed by Timberline Ski Area. The Salt Management Plan provides a framework for the management of all aspects of salt application on the Palmer snowfield, including all environmental evaluations. A more detailed report regarding this monitoring is on file at the Zigzag Ranger District Office.

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. 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.

The following are specific conclusions based on data collection in water year 2005 and general conclusions that have been made based on review of 17 years of monitoring data:

- The total salt application to the Palmer snowfield in water year 2005 (715,480 pounds) was significantly less than the average salt application for the previous ten years (1,058,745 pounds).
- Water year 2005 was a dry year, in which the total precipitation (73 inches) was only 67% of the average total precipitation for the previous ten-year period (108.5 inches). The water year 2005 snowpack was by far the lowest in the Timberline period of record, with snow water equivalents (SWEs) consistently less than a third of the average mean monthly SWE recorded over the 17-year Timberline period of record.
- Chloride concentrations observed in all monitored streams are well below the ODEQ drinking water standard, and below the EPA water quality criteria for exposure to salt-sensitive biota.
- Running seven day mean specific conductance values did not exceed ODEQ guidance values at Salmon River 3445, while weekly average conductivity values at the Still Creek Camp Host station exceeded ODEQ guidance values one time.
- Weekly mean TDS levels observed at monitoring stations within the Palmer drainage area during water year 2005 were below the ODEQ criterion with few exceptions. Weekly mean TDS concentrations slightly exceeded the ODEQ guidance value once at Salmon River 3445. Weekly mean TDS concentrations at the Still Creek Camp Host station exceeded ODEQ guidance values on five occasions in WY 2005.

Reference Reach Monitoring – Eastside Mt. Hood National Forest

Successful stream restoration requires understanding the causes of degradation, specific knowledge of the stream's present state, and understanding the stream's most stable dimension, pattern, and profile based on its present valley type and flow regime.

The main objectives for reference reaches are to collect data on the physical character of stream channels that occur on the Forest that are considered to be in stable conditions. The term "stable" does not necessarily mean pristine, but rather it means that it would be a good example of how a stream of that size and channel type ought to look in that landscape. A variety of physical stream attributes will provide baseline data to compare against adversely impacted and nonfunctioning stream reaches, estimate the impacts of proposed land use or management activities, and design appropriate restoration projects on that stream or similar stream types (Harrelson 1994).

During the summers of 2005 and 2006, 13 reference reaches were surveyed on the following streams:

- East Fork Hood River,
- Eightmile Creek,
- Lake Branch,
- Pinnacle Creek,
- McGhee Creek,
- Bear Creek,
- Fifteenmile Creek,
- West Fork Hood River, and
- Robinhood Creek.

During the summer of 2007, several additional reference reaches on the eastside of the Forest will be measured.

Recommendations

- Continue implementation of the Best Management Practices Evaluation Process (BMPEP).
- 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.
- 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 2007 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 Total Maximum Daily Loads (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.
- Continue planned implementation, effectiveness and water quality monitoring of road decommissioning activities in the Bull Run watershed.

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

In spite of continuing reductions in funding for road maintenance, construction, and reconstruction, the Forest continues to advance toward the objectives of the Forest Service Roads Agenda.

Transportation Management Objectives:

- The Forest is decreasing the size of the transportation system.
- The Forest is maintaining or improving 460 miles of mainline road system.
- The Forest is decommissioning, closing or downgrading the maintenance levels on the remainder of the 2,929 mile road system.
- The Forest's 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, the Forest has been focusing efforts on storm-proofing and closing roads.

Approximately 50% of the 3,389 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.

Reductions of road densities in the thirteen key watersheds are 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 maintained to access an area or developed campground for passenger car use instead of two or three.
- There will be a decreased amount of miles available for recreation opportunities that accommodate passenger car traffic. Recreation opportunities that accommodate high clearance vehicles would be increased.
- The increasing demand of Forest recreation use along with the decreased amount of miles available for passenger car traffic will result in more vehicle encounters, raising the probability of accidents occurring. Maintenance efforts, however, will be more focused on the mainline access roads.
- There will be less sediment reaching waterways.
- There will be less harassment to wildlife.

2006 Accomplishments

- Miles of Road at end of 2006.....3,389 mi
- New Road Construction0 mi.
- Miles of Road Decommissioned.....0 mi.
- Miles of Road at end of 2006.....3,389 mi.
- Total Miles of Passenger Car Roads.....460 mi.
- Passenger Car Roads Maintained to Standard231 mi.
- Percent of Passenger Car Roads Maintained to Standard.....50%
- Total Miles of High Clearance Roads.....1,387 mi.
- High Clearance Roads Maintained to Standard319 mi.
- Percent of High Clearance Roads Maintained to Standard.....23%

Road Maintenance

Funding for road maintenance has decreased in recent years while the aging road system deteriorated at an increasing rate. Most of the 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 2-11. Road Maintenance Budget.

	FY89	FY04	FY05	FY06
Annual Road Maintenance Needs	\$5.2 million	\$1.8 million	\$2.0 million	\$2.1 million
Annual Road Maintenance Budget	\$3.8 million	\$0.5 million	\$0.6 million	\$0.5 million
Percent of Needs Met by Budget	73%	28%	30%	24%

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. As the above table shows, however, the Forest Service has not been able to decrease the needs fast enough to keep pace with the decreasing budget. Out of necessity the Forest Service has focused the limited road maintenance funds on the highest priority roads, primarily the low clearance passenger car roads that access major recreation destinations. 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. For economic reasons, the Forest has been focusing on road closures.
- Seek alternative funding sources for road maintenance.

The Forest roads engineering department has aggressively pursued the first two alternatives listed above. Forest has been less successful at generating additional funds for road maintenance, although partnerships have been helpful.

Partnerships

The Forest encourages partnerships in road maintenance whenever possible. The timber sale program continues to provide funds or work in-kind to maintain a safe, economical timber haul. Oregon Department of Transportation (ODOT) has always been a welcome partner where the two organizations can cooperate on mutually beneficial projects. The City of Portland Water Bureau has taken responsibility for a major share of the road maintenance in the Bull Run Watershed. Local counties have contributed to maintenance of the Forest roads through the Payments to Counties Act. Smaller partnerships have been developed with ski areas, youth conservation corps, and local landowners. The Forest anticipates that partnerships will play an increasingly significant role in Forest road maintenance as appropriated funds continue to decrease.

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

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.

Threatened, Endangered, and Sensitive Species

Bald Eagle

The bald eagle is listed as threatened by the state of Oregon and the U.S. Fish and Wildlife Service. Bald eagles are primarily a winter migrant on the Forest and there is evidence of past nesting. The Forest Plan designates areas on the Forest for existing and established winter communal roost areas.

In 2003, a new bald eagle nest was identified located near Rock Creek Reservoir. The site was occupied and with young in 2003, but not in 2004, 2005 or

2006. The Clear Lake pair did not nest at Clear Lake in 2004, 2005 or 2006. A new nest at Timothy Lake, however, is suspected to be the same pair. They did not fledge young in 2004 or in 2005. There was one eagle fledged from the Timothy Lake nest in 2006.

The U.S. Fish and Wildlife Service intends to delist the American bald eagle in June of 2007 because the eagle population has been expanding and is no longer considered threatened.

Northern Spotted Owl

The northern spotted owl is listed as threatened by the U.S. Fish and Wildlife Service. Management of spotted owls is outlined in the Northwest Forest Plan Standards and Guidelines and includes designated 100 acre Late Successional Reserves (LSRs) for *known* northern spotted owl sites.

Monitoring needs by the Forest have decreased with the assumption that management activities that maintains required habitat and operates outside of critical periods are sufficient to maintain a persistent and viable population of spotted owls. An interagency demographic study has replaced monitoring on individual Forests. The demographic study is designed to be statistically significant in monitoring the owl population across its range. The demographic study reported a decline in spotted owls of 2.8% per year for Oregon.

In 2006, the Barlow Ranger District accomplished owl calling for the SF Mill Fuel Break project. There were 19 spotted owl calling stations that accomplished 6,080 acres called for the first year visit. No spotted owls were reported from this calling effort.

Peregrine Falcon

In 1999, the peregrine falcon was delisted and is no longer considered threatened or endangered by the U.S. Fish and Wildlife Service. The Forest Service will continue to manage peregrines as a sensitive species. Potential nesting habitat for the peregrine occurs on all Ranger Districts.

Monitoring for peregrine nesting in 2005 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 was completed for one site and is in draft form on the other. There have been no current efforts to establish presence or absence on new sites. In addition, there are insufficient personnel to survey all of the potential sites.

Lynx

Lynx is listed as threatened in Oregon by the U.S. Fish and Wildlife Service. The Forest currently has no mapped lynx habitat. The criteria for identifying lynx habitat is based on the Lynx Conservation Assessment and Strategy of at least ten square miles (6,400 acres) of primary vegetation (i.e., subalpine fir plant associations) should be present within a lynx analysis unit to support survival and reproduction. The Forest has approximately 1,270 acres of subalpine fir plant associations. Therefore, the Forest lacks the minimum criteria to identify lynx habitat and develop a lynx analysis unit.

Based on trapping records, the Oregon Department of Fish and Wildlife feels this species has been extirpated from Oregon or never existed in the State. An independent study of snow conditions was

initiated on one District, but no evidence of lynx was found. Surveys for lynx were completed in 2001 by the Forest Service in cooperative effort with Cascadia Wild and Teachers in the Woods. No lynx were documented on the Mt. Hood, Gifford Pinchot, Willamette, or Deschutes National Forests. If lynx are present on the Forest, their numbers are extremely limited. Over the past several years, however, there have been about 13 unconfirmed lynx sightings across the Forest. Most, if not all lynx sightings on the Forest were probably bobcats that have been misidentified as lynx or transient individuals that have left good habitat due to population crashes of snowshoe hares.

Sensitive Wildlife Species

Harlequin Duck

Harlequin Ducks were not surveyed in 2006. No incidental sightings of the ducks were reported.

Cope's Giant Salamander

Annual surveys for Cope's giant salamander are conducted on the Forest by volunteers from the Wetland Wildlife Watch. The 2005 report indicated that there were two locations for Cope's giant salamander during the Wetland Wildlife Watch surveys.

Wolverine

No aerial surveys for wolverine tracks were conducted in 2006 and no individuals were observed. Instead, there was a tracking and hair snag project that was aimed at identifying the presence or forest carnivores on the Forest. No rare carnivores (e.g., wolverine, lynx, or fishers) were observed.

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 coordinator and a Forest Service biologist in 2006. One loon was observed in the Bull Run Watershed. Nest platforms have been installed on Upper and Lower Bull Run Reservoirs, but no nesting has occurred at this time.

Snags and Down Woody Material

The Northwest Forest Plan provides standards for snags and down woody materials. All recent timber harvest units retain quantities of snags throughout to meet the needs of most primary cavity nesters with a few exceptions. Inventories on Clackamas River Ranger District indicate compliance with standards and guidelines and indicate that snags are surviving harvest activities. 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.

Additional snag inventories were implemented in 2006 to verify snag counts from insect and disease aerial survey estimates. The results of this study indicate that aerial surveys underestimate snag densities on the eastside of the Forest by approximately a third. Westside data indicate that snag estimates from aerial surveys are poor predictors of actual snags for a variety of reasons.

The results of CVS (current vegetation survey) monitoring plots indicate that snag numbers are increasing over time due to the reduced harvest of insect and disease prone areas and continual outbreaks of insects. These naturally created snags are more desirable from a wildlife perspective than man-made snags because they are more prone to heart rot and, therefore, provide more cavities.

Summer and Winter Range

Deer and elk habitat is typically characterized as summer or winter range depending on the season of use. Optimal cover, thermal cover and forage are important habitat components for deer and elk. In the Forest Plan, harvest activities were expected to help maintain stable populations by providing a consistent quantity of foraging areas and early seral plant communities. With a reduction in regeneration harvest, suppression of fire and dense nature of the habitats in the western cascades, less forage is being produced for deer and elk making forage a limiting factor on the Forest. Winter range areas continue to move away from early seral stages and forage opportunities continue to decline. 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.

In addition, road densities in winter range in most watersheds are above the standard suggested by the Forest Plan. Efforts are being made to remedy this where possible.

The following are the professional assessments 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 on the eastside of the Forest with the increased use of underburning methods. Deer populations are stable to increasing. Elk populations appear stable. This is based entirely on anecdotal data from biologist field observations.

Clackamas Ranger District

Winter and summer ranges have remained constant. Populations appear to be stable. This is based entirely on anecdotal data from biologist field observations. Video technology has been used to monitor forage projects and permanent openings to determine effectiveness. A small amount of increase in forage is expected for 2007 in the area of the Blister Creek fire. This area is mostly summer range.

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. This is based entirely on anecdotal data from biologist field observations. A small amount of forage is expected in the area of the Mt. Hood Complex Fire that occurred in 2006. This forage is in both summer and winter range for elk and deer. That combined with insect and disease areas should improve forage for ungulates on the eastside of the Forest.

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. As such, the amount of cover is increasing and forage is decreasing. In the District biologist's opinion, the populations of deer and elk are stable on this District.

Pine Marten and Pileated Woodpecker

Tracking efforts and the cameras surveys were done in partnership with the Portland based Cascadia Wild Tracking Club. The current effort recorded 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. Cascadia Wild's efforts were invaluable to the success of this survey, providing valuable data and involving the public in the inventory process. This effort has been continued into FY 2007. The following table summarizes the results of the survey effort.

Table 2-12. Species Observed from Mt. Hood National Forest Remote Camera Transects (FY 2003-2005).

	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	0
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
Red Tailed Hawk	2	0	0
Steller's Jay	32	0	0
Varied Thrush	2	0	0

Late Successional Reserves, Riparian Reserves, and designated 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 provides anecdotal evidence that populations of pileated woodpeckers seem adequate.

The former B5 pileated woodpecker and pine marten habitat areas on the Forest retained in watersheds with limited habitat appear to be functioning as good habitat for these two species. Very little activity has occurred in these retained habitats. Very little management activity is occurring in the Late Successional Reserves, Riparian Reserves and designated Wilderness Areas.

In the fall of 2005, the remote camera project was dropped and Cascadia Wild implemented snow tracking because of the efficiency of covering more ground. Some hair snag traps were deployed but the results of these traps have yet to be analyzed.

Recommendations

- Continue to monitor peregrine falcon and bald eagle nesting.
- Continue use of prescribed fire to enhance big game forage areas on eastside districts.
- Implement additional surveys for Wolverine and Fisher to verify sighting reports.

Wildlife Sustainability

Wildlife Habitat

Many wildlife species depend on either or both late and early seral habitats. Examples of late seral species are northern spotted owls or red tree voles. Examples of early seral species are elk, blue birds, and Townsend's solitaires. The Northwest Forest Plan manages for late seral habitats across the landscape in designated Late Successional Reserves, Congressionally Withdrawn Areas, Riparian Reserves, and designated Wilderness Areas. Most wildlife biologists believe that late seral habitat is 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 successional dependent species.

Early seral habitats are much easier to produce and also can be produced by naturally occurring disturbances, such as fire, windstorms, insect outbreaks, and by manmade events, such as timber harvests. 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, quality 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 to allow naturally and fire created openings to seed in naturally, placing less emphasis on controlling wildlife damage to young trees, and conducting regeneration harvests instead

of thinnings. Openings created by timber harvest should be planned to provide a continuous rotation of openings adjacent to mature areas. Given the emphasis on managing the land for late seral habitat, the expected trend is a shift of the federal landscape to mature and late seral habitats. To ignore this early age structure is to ignore the majority of species using the Forest.

Forest fragmentation has been a major concern of ecologists for many years. 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. Maintenance of large contiguous blocks on the landscape will ensure fragmentation effects are minimized. At the same time, small isolated blocks of timber are valuable to less mobile species in order to maintain viability until larger adjacent stands can develop sufficient maturity to allow emigration. In addition, these blocks 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 sensitive species use these habitats on the Forest. 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 wetlands. Every effort should be made to reduce cattle grazing in these areas. One effort was begun in 2006 to install a buck and pole fence to reduce cattle use in the Camas Prairie Meadow on the Barlow Ranger District. This area is the only known location on the Forest where spotted frogs occur. Campgrounds, such as the North Arm of Timothy Lake, Little Crater, and Bonney Meadows, should be moved to a less sensitive sites. The presence of campers adjacent to the meadows reduces the wildlife opportunity and use in the wetland. These areas also should 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 invasive plant seed.

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 and can be affected by human disturbance. Most of these habitats have been protected in one form or another by road closures or bat gates.

The bat gate at Townsend's Big-eared Bat hibernaculum continues to be vandalized. Efforts are being made to fortify this structure. The original number of bats found at this site was 21 in the 1990s. The recent survey found 11 bats at the site. The reason for the decline is unknown.

High Elevation Species

At one time high elevation species were not threatened by human intrusion. This is habitat that has been used for breeding for species such as gray-crowned rosey finch, horned larks, American pipits, American marten, and wolverine. For some species, such as wolverine, this was a last strong hold for their populations.

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. 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

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.

That leaves one area of concern – connectivity across roads. This concern has been addressed in Europe and in Canada with very expensive and elaborate road crossing areas for wildlife. Most of the Forest roads are not a barrier to wildlife passage. Only a few roads can be considered barriers. The roads are barely passable to wildlife due to the large amount of traffic, and will only become less passable in the future. This is only a problem 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. Many species are sensitive to vehicle traffic and just the traffic alone would act as a barrier. Those individuals that try to cross are more than likely to be hit in the road. If the Forest wants to sustain all of the 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.

People's Influences on Populations

People have a substantial impact on the sustainability of wildlife populations through their presence and activities in the Forest. People like to 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 habitat and reproductive success. Due to the proximity of the Forest to the Portland metropolitan area, this Forest gets a higher proportion of use and thus influence on wildlife than other more rural forests.

Recreation and off-highway vehicle (OHV) plans should consider the influence on wildlife populations. Some seasonal restrictions may 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. This list includes thirty-four plant species that are documented from or are suspected to occur on the Forest. From 2000 to 2006, monitoring has focused on nine non-forest sensitive species. Included are yellow agoseris (*Agoseris elata*), sickle-pod rock cress (*Arabis sparsiflora* var. *atrорubens*), 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*). Recently, several new sites have been found for two sensitive lichens: Fringed pelt lichen (*Peltigera pacifica*) and Methuselah's beard (*Usnea longissima*).

Results

Agoseris elata – *Agoseris* is endemic to Washington, Oregon, and California. It is known to occur at three wet meadow sites on the Forest. A search was conducted to relocate plants at a historic site at Clackamas Meadows. For the third year in a row, none were found and it is now believed that *Agoseris* is likely extirpated from the site. A site at Brooks Meadow was revisited; the population appeared to be stable and has spread into wet areas in the upper meadow.

Arabis sparsiflora var. *atrорubens* – Sickle-pod rockcress is known from Oregon, southeastern California, and Idaho to Utah. There are several populations on the Forest; all are east of the Cascade Crest. Monitoring was conducted at a site along Mill Creek Ridge adjacent to The Dalles Watershed/Research Natural Area and at a site on Surveyors Ridge. Invasive plants (knapweed and thistle) have been handpulled annually at both sites. The invasive plant control has been effective particularly along Mill Creek Ridge. Both populations appear to be stable.

Coptis trifolia – Three-leaf goldthread populations have been documented in the Virgin Islands, Japan, Siberia, the northeastern and eastern United States, Alaska, and Oregon. On the Forest, only two sites are known, both in wet fen locations. One site has been reported 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 cut-banks adjacent to a stream where plants were growing. Some herbivory of *Coptis* also was observed.

Corydalis aquae-gelidae – Coldwater corydalis is a riparian species presently known to occur only on the Mt. Hood, Willamette, and Gifford Pinchot National Forests. Most Forest populations of coldwater corydalis are located on the Clackamas River Ranger District. Monitoring was completed 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. Plans for monitoring the Oak Grove Fork as part of Portland General Electric's stewardship are being finalized.

Fritillaria camschatcensis – Kamchatka fritillary is known from Alaska, Washington, and Oregon. The single known population occurs in a wet meadow on the westside of the Forest in the Bull Run watershed; the population represents the southern most extension of this species' range. Monitoring of black lily through a Challenge Cost-Share agreement with the Portland chapter of the Native Plant Society of Oregon has found the population to be stable at this time.

Lomatium watsonii – Watson's lomatium is endemic to Oregon and Washington. The single known population of this species on the Forest is located in an open cobbly slope on the Hood River Ranger District. Knapweed plants have been handpulled annually to reduce competition with the Watson's lomatium and limit the amount of weed seed produced around the habitat. Invasive plant encroachment continues to be a problem; hand pulling invasive plants at the site is a continuing effort. There was also a threat from off-road vehicles, but the placement of boulders as barrier has been successful and the population is stable.

Ophioglossum pusillum – Northern adders-tongue is circumboreal, occurring in North America from Alaska, British Columbia, and the northern United States south irregularly to Florida, California, and Mexico. Two sites are known in wet meadow habitat on the 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 2005, indicating that the population is stable. More plants were found at one site than previously observed. An invasive plant, Canada thistle (*Cirsium arvense*) was found to be encroaching at both sites. Continued encroachment of thistle, an aggressive invader, could negatively affect the adder's-tongue populations in the future. The thistle at the two sites has been identified for herbicide treatment in the Forest's site-specific invasive plant treatments EIS.

2006 Monitoring Report

Peltigera pacifica – Recently, several new sites for this lichen have been found on the Forest: (1) the summer home tracts near Zigzag-Rhododendron; and (2) two proposed timber sale areas on the Clackamas River Ranger District (No Whiskey and 2007 Plantation Thinning). Although regionally rare, *P. pacifica* may be uncommon to relatively common on the westside of the Forest.

Suksdorfia violacea – Suksdorf's violet is endemic to Oregon and Washington with reported historic sightings in western Idaho and Montana. Until 2006, only one known population of Suksdorf's violet was known on the Forest on the Hood River Ranger District. In 2006, a sub-population was found a few miles away. The main population represents the southern-most extent of the species' geographical range and is one of approximately seven known sites in Oregon. The site is a popular recreational rock climbing area.

Cooperative management of violet *Suksdorfia* with a local rock climbing association continued through 2006. Posting of signs and public education have reduced adverse impacts, and informal census shows the population at this site is currently stable and has increased in one area of the rock face where public access is restricted from climbing. In 2006, three additional signs were produced for posting in the climbing area in 2007.

Sisyrrinchium sarmentosum – This species is known to occur on the Mt. Hood and Gifford Pinchot National Forests. In June to July 2005, the Forest collaborated with Berry Botanic Garden on a study to differentiate *S. sarmentosum* from *S. idahoense* based on morphological characters and DNA analysis by examining both species. The two species appear to hybridize. Berry Botanical Garden plans to publish a report or scientific paper on the differences and hybridization between the two species sometime this year. A botanist on the Gifford Pinchot National Forest recently completed a Conservation Assessment for the species, which is currently being reviewed. Recently, two new populations of *S. sarmentosum* were found on the Forest: one on the Barlow Ranger District and the other in a meadow in the Collawash River drainage on the Clackamas River Ranger District.

Usnea longissima – In the last year, several new sites for this rare circumboreal lichen have been found on the Forest: (1) the summer home tracts near Zigzag-Rhododendron; and (2) two proposed timber sale areas on the Clackamas River Ranger District (No Whiskey and 2007 Plantation Thinning).

Forest 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

- *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. Revisit the Brooks Meadow site to continue monitoring population stability.
- *Arabis sparsiflora* var. *atrorubens* – Develop management options for *Arabis* habitat enhancement including the use of prescribed fire in selected habitat areas along Mill Creek Ridge.
- *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* – A long-term monitoring plan is included in the new 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 invasive plants from the Watson’s lomatium site and monitor habitat trends. Continue protection for off-highway vehicles (OHVs). Extend surveys up to similar suitable habitat areas on the summit of Bald.
- *Ophioglossum pusillum* – Investigate the herbicide treatment of Canada thistle to help maintain habitat for the known sites for this species.
- *Peltigera pacifica* – Continue surveying for new sites and protect extant sites.
- *Suksdorfia violacea* – Continue to work with the climbing association to eliminate adverse impacts to violet *Suksdorfia* while allowing for managed recreational rock climbing. Outreach for new partners to participate in updating the existing Memorandum of Understanding with the Forest Service. Install signs to mark the “no-climbing” areas on either side of the main climbing walls. Install environmental education signs near the trailhead. Continue to distribute environmental education pamphlets in drop-boxes along the trail and at climbing stations.
- *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.
- *Usnea longissima* – Continue surveying for new sites and protect extant sites.

Soil Resources

Goal

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

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

Accomplishments

As in previous years, two needs guided the direction for soil monitoring in 2006. First, the need to continue to monitor those areas that have been harvested so that cumulative effects can be documented. Second, using monitoring data to evaluate planning areas and specific stands proposed for timber harvest activity so that effects can be better predicted.

One harvest unit was monitored for detrimental soil impacts from ground based logging systems and fuel treatments. Results are below the standard, even though the unit had previous harvest activity as summarized in Table 2-13.

Table 2-13. Measured detrimental impacts by silvicultural treatment and logging system.

Silvicultural Treatment	Logging System	Fuel Treatment	Previous Entries	Percent Soil Impacts
Thinning	Ground-based	Landing pile	>1	5

Recommendations

Monitoring results in 2006, as compared to previous years, continues to suggest that progress is being made with regard to the number of harvest units where soil damage exceeds the standard. Table 2-14 below compares monitoring data from two distinct time periods. All data was collected using the same methodology (shovel probe transects); and although there are likely factors (such as statistical) not taken into account, it is a logical assumption that soil damage has been reduced from time period one to time period two. This trend is likely due to two main factors.

First, sale administrators and operators are aware of soil damage concerns and do a very good job of minimizing soil damage. Second, equipment technology has reduced compaction impacts. Monitoring to determine cumulative effects should continue in order to find out whether this trend will continue. Also, existing conditions monitoring and documentation needs to continue in order to provide a sound basis for cumulative effects estimation in NEPA documents. Units monitored for existing conditions should also continue to be tracked and monitored as harvest, fuel treatment, and rehabilitation (if needed) occur in order to verify estimates made in NEPA documents.

Table 2-14. General overall comparison of detrimental soil damage using data from monitored units over two time periods.

	Percent Detrimental Soil Condition (Ground Based Logging Systems)	Total Number of Units	Total Number of Units by Time Period	Average Percent of All Units by Year	Average Percent of All Units by Time Period
Time Period One					
1980	6,5,20,27,25,30,22,43,42,39	10	33	26%	22%
1981	8,0,28,9,6,7,27,10,33,18,27	11		16%	
1982	14,33,34	3		27%	
1983	6,23,23,3,9,39,15,24,27	9		19%	
Time Period Two					
1998	2,1,1,5,7,4,28,21	8	33	9%	7%
1999	6,4,3,9,9,5,10,4,7,1,3,13,19	13		7%	
2000	6,3,2,3,1,1,1,2	8		2%	
2003	13	1		13%	
2005	7,4	2		6%	
2006	5	1		5%	

Recreation

Social System – Social and Cultural Values

Wilderness Use

Wilderness areas in the Forest are smaller than many other Northwest wildernesses, with visitors' trip duration being generally shorter. The average duration of a visit to the Forest is seven hours (2003 National Visitor Use Monitoring). People seeking multi-day or week long wilderness treks usually seek larger, more remote wildernesses. Currently, more than 80% of the use on all popular wilderness trails is day use.

Table 2-15 shows use in Mt. Hood Wilderness areas in 2006 measured at entry points (trailheads). Most of the trails have high day use, especially on weekends. Ramona Falls remains by far the most popular portal, and data indicates that average group size is largest at this trailhead (average group size is 2.6 people). No data is available to measure the number of group encounters on this trail in 2006.

The second most popular portal is the Pacific Crest National Scenic Trail (PCT) accessed at Timberline Lodge. More than half of the visitors entering the wilderness here do so with the intent to stay overnight. Overnight visitors accessing the wilderness from Timberline represented approximately 62% of all overnight visitors in 2006.

Visitation to the Mt. Hood Wilderness in 2006 was significantly lower than in previous years. During most of this decade, annual visitation has been between 33,000 and 40,000 people. Some of the reduction may be attributable to the closure of several popular trails (including the Timberline Trail) during August because of the Bluegrass fire. Also, snow at higher elevation trailheads melted out late this year.

Table 2-16 shows use at popular trailheads in the Salmon-Huckleberry and Mark O. Hatfield Wilderness areas in 2006. Most of the trails within the Salmon-Huckleberry and Hatfield Wilderness areas have very little use with the exception of the Salmon River, Eagle Creek and Wahtum Lake.

Table 2-15. Mt. Hood Wilderness visits from May 15 through October 15, 2006. (Data is from self-registration stations at trailheads. Sampling by Forest staff shows that approximately 93% of Mt. Hood National Forest wilderness visitors self-register. Total use includes overnight visits.)

Trailhead	Total Use People	Total Use Groups	Overnight People	Overnight Groups	Percent Day Use	Dogs	Horses
Burnt Lake North	2,392	1,004	481	181	80%	476	16
Burnt Lake South	951	418	261	103	73%	143	3
Cast Creek	228	127	60	31	74%	63	69
Castle Canyon	295	133	0	0	100%	43	0
Cloud Cap	2,678	1,073	532	216	80%	217	0
Elk Cove	178	70	26	9	85%	28	0
Elk Meadows North	117	66	24	15	79%	22	0
Elk Meadows South	783	394	140	55	82%	104	0
Hidden Lake	393	179	16	11	96%	91	6
Horseshoe Ridge	280	137	17	8	94%	38	33
Mazama	402	219	40	18	90%	60	0
McGee Creek	1,166	550	311	156	73%	130	0
Muddy Fork Top Spur	2,995	1,204	228	98	92%	321	8
Newton Creek	183	77	154	83	16%	8	0
Paradise Park	334	169	66	27	80%	58	9
Pinnacle Ridge	187	78	34	15	80%	13	0
Ramona Falls	7,453	2,923	461	192	94%	1,008	89
Tilly Jane	234	109	15	7	94%	29	0
Timberline – Climb	4,778	No Data	282	No Data	94%	19	0
Timberline – PCT	4,771	2,031	2,693	1,045	44%	396	16
Vista Ridge	1,147	501	298	117	74%	140	0
West Zigzag Mtn.	177	90	0	0	100%	20	0
Zigzag Mtn. Road 19	134	80	0	0	100%	38	0
Totals	32,256	11,632	6,139	2,387	81%	3,465	249

Table 2-16. Mark O. Hatfield and Salmon-Huckleberry Wilderness area visits from May 15 through October 15, 2006. (Data is from self-registration stations at trailheads. Sampling by Forest staff shows that approximately 93% of Mt. Hood National Forest wilderness visitors self-register. Total use includes overnight visits.)

Trailhead	Total Use People	Total Use Groups	Overnight People	Overnight Groups	Percent Day Use	Dogs	Horses
Salmon-Huckleberry							
- Salmon River West	2,300	989	14	5	99%	329	0
Mark O. Hatfield							
- Eagle Creek	3,610	1,559	1,559	651	57%	211	0
- Whatum Lake	882	319	408	139	54%	93	8
Hatfield Totals	4,492	1,878	1,967	790	56%	304	8

Economic System – Built Capital

Campgrounds

Visitation and utilization data was reported by permit holders for concessionaire-managed campgrounds in 2006 (Table 2-17). Campground occupancy generally increased in 2006 in spite of a rainy Memorial Day weekend. In the East Fork complex, Sherwood and Nottingham campgrounds closed on August 7, 2006 because of the Bluegrass fire. While use in the Highway 26 corridor campgrounds was relatively flat in 2006 compared to 2005, the trend at Clackamas complex campgrounds increased. All Clackamas complex campgrounds had more visitors in 2006 except Hidden Lake.

Concessionaire records indicate that the number of campers increased by 3% in the Highway 26 complex campgrounds and 25% in Clackamas complex campgrounds in 2006 (compared to 2005). This is a larger jump than the increase in site occupancy, suggesting that party size increased slightly.

Occupancy data for eastside rustic campgrounds was collected in 2006. For the Barlow Ranger District campgrounds, approximately 1,654 sites were occupied which equates to 17% occupancy.

The Forest Plan 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 2006, as well as those for the past several years, suggest otherwise. Like similar older recreation complexes throughout the

National Forest System, the campgrounds on the Forest 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 actually be shrinking. In general, the Forest has more developed camping capacity than demand on most days during the camping season, with the exception being weekends during July and August.

In 2007, the Forest will engage in recreation site facility master planning (RS-FMP). With public involvement, the Forest will examine supply, demand, and cost to operate and maintain developed recreation facilities. These evaluations will allow us to carefully and wisely manage recreation facilities and programs that meet current and future public needs and ensure recreational activities provide the right opportunities in the right places.

Table 2-17. Mt. Hood National Forest campground use in FY 2006 by number of campers, number of sites occupied, and percent occupancy. Olallie data does not include Paul Dennis Campground (there was no report by publication date).

Campground Complex	No. Campers	No. Sites Occupied	Percent Occupancy
Hwy 26	110,876	28,380	32%
Clackamas River	45,406	11,420	24%
Lost Lake & East Fork	No Data	7,038	31%
Olallie	No Data	2,195	31%

Ski Areas

The 2005/2006 ski season got off to a great start with cold temperatures and heavy snowfall from late October into mid-November, building a snow pack well above normal. Snow pack depth, measured at Timberline, reached a high of 203 inches on March 15, 2006. Normal snow pack depth on this date is 140 inches. In 2005, the snow pack depth at Timberline never exceeded 88 inches.

Use of the Forest’s five alpine ski areas during the 2005/2006 winter season was significantly higher than in the 2004/2005 winter season. According to the Pacific Northwest Ski Areas Association 2005/2006 Annual Visitation Report, Mt. Hood Meadows had 493,347 visits, 302,625 visits more than the previous year (a 159% increase). Timberline reported 217,660 visits, 78,944 more visits than the previous year (a 57% increase). Cooper Spur reported 22,906 visits. Mt. Hood Ski Bowl had a sizable bump from the previous year with a total of 182,899 visits, 36,066 visits more than the 2004/2005 winter season. Summit Ski Area reported 14,347 visits, which is their highest visits since the 1996/1997 winter season.

Table 2-18. Mt. Hood National Forest ski area visits in winter 2005-2006. (Data for Cooper Spur, Mt. Hood Meadows, Ski Bowl, and Summit from Pacific Northwest Ski Areas Association. Timberline data for 2005-2006 from RLK and Company and includes summer skiing.)

Ski Area	2003-2004	2004-2005	2005-2006	10-Yr Avg.
Cooper Spur	19,385	915	22,906	7,903
Mt. Hood Meadows	425,378	190,722	493,347	356,016
Ski Bowl	151,963	146,833	182,899	146,134
Summit	4,085	No Report	14,347	7,632
Timberline	266,766	196,856	217,660	252,348

Trails

The Forest Plan projected that trail construction and reconstruction would average 74 miles per year for each decade. Appropriated trail construction funding has diminished, and the actual average accomplishment for the Forest is less than 10 miles. During 2006, the Forest awarded a contract to reconstruct 8.8 miles of the Pacific Crest National Scenic Trail (PCT) from Lemiti Creek to Skyline Road (Olallie Lake). This project will be the last reconstruction of the Mt. Hood portion of the PCT for the foreseeable future.

The Forest Plan projected that there would be 1,560 miles of trail during the second decade. Currently, there are 977 miles of trail in the forest.

Forest Resources and Timber Supply

Goal

The goal is to sustain ecological conditions to provide a continuing supply of forest products, and to provide a positive economic return.

Monitoring Activities and Evaluation

The Forest Plan identified timber objectives to be monitored and evaluated to determine the Forest's capability to provide a continuing supply of wood products. Forest suitability, productivity and assumptions used in determining sale quantity are monitored as well as meeting standard and guidelines for other resource objectives.

Ecological Integrity– Landscape Function, Structure and Composition

Landscape patterns can be defined in terms of vegetation community types present, the seral stage (or age) of these vegetation types, and their vertical and horizontal structural characteristics. The vegetation patterns or mosaics help us to look at the implications of vegetation management on attaining landscape-desired conditions.

Timber harvest influences vegetation patterns by affecting the distribution of seral stages across the landscape. In 2006, harvest occurred on a very small portion of the overall landscape. Harvest occurred on 2,083 acres, which equals less than half of a percent of the total acreage on the Forest; a harvest rate well below the annual probable sale quantity. Eighty-five percent, or 1,761 acres, of the harvest occurred on lands designated as Matrix in the Northwest Forest Plan. Most scheduled timber harvests that contribute to probable sale quantity occur in the Matrix land allocation. In addition, harvest occurred on 190 acres within the Riparian Reserves and 108 acres in Late Successional Reserves (LSR) to meet the objectives of those land allocations.

Ecological Integrity – Ecosystem Function, Structure and Composition

The objective for timber resources is to produce a continuing supply of wood products at sustainable levels consistent with other resource values and economic efficiency. The productive capacity of a forest is critical to providing a continuing supply of wood products. Productivity is also strongly linked to sustainability issues given the importance of the forest's contribution to carbon sequestration and climate change.

Timber Inventory, Forest Growth and Mortality

The Pacific Northwest Current Vegetation Survey, along with Forest GIS layers of land allocations, can be used to estimate the current standing inventory of the 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. In addition, one measure of sustainability is whether the level of timber harvest is considered sustainable in terms of forest growth.

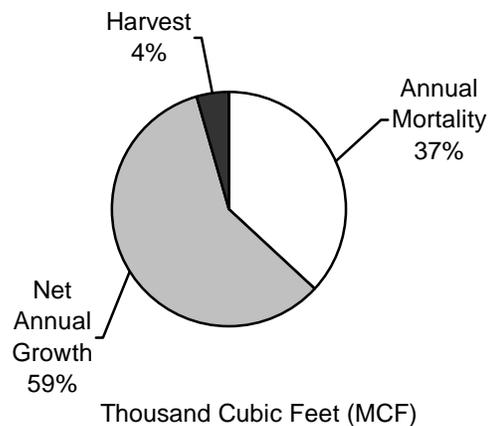
The following pie chart (Figure 2-1) displays the net annual growth, annual mortality and harvest for 2002. Since the inventory plots have not been re-measured since 2002, the chart was not updated for 2006. Percentages are relatively similar.

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 while management practices, such as thinning and reforestation, are contributing to increasing growth rates.

The lack of harvest, however, may be contributing to increased mortality resulting in both positive and negative ecological benefits. In Oregon, tree growth exceeds harvest rates overall by a wide margin and the Forest follows a similar trend (Forest Fact Book, Oregon Forest Resources Institute, 2003 edition).

The mortality is comprised mainly of the smaller trees related to suppression. Mortality also includes larger trees that have died as a result of insects, disease, or other factors. Tree mortality contributes to nutrient cycling through decomposition of organic matter. The standing and downed wood is habitat for many species. 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. Large amounts of mortality can become a hazardous fuels concern.

Figure 2-1. Growth, Mortality and Harvest on Mt. Hood National Forest.



Change in Inventory of Standing Timber - Disturbance from Forest Insects and Diseases

The Forest Plan monitors catastrophic changes in the amount of standing timber inventory which may result from disturbances, such as fire, windstorms, and insect outbreaks. In addition, annual review of current insect and disease survey maps are used to determine trends and effects on tree growth and mortality. Cumulative loss of harvestable growing stock is monitored and tracked.

Annual Aerial Detection Survey

Bark beetle outbreaks have caused significant amounts of tree mortality on the Forest and adjacent lands for the last several years. Approximately 113,000 acres of the Forest have significant levels of dead trees from bark beetle activity. There are approximately 197,000 acres of affected lands, including lands immediately adjacent to the Forest, namely the Confederated Tribes of Warm Springs Reservation. This is roughly a 30% increase in affected acres over FY 2005 indicating there is still host material (i.e., dense lodgepole and mixed conifer stands available for the mountain pine beetle outbreak to continue).

The following map (Map 2-1) summarizes the cumulative data from the annual aerial survey program to depict levels of insect-caused mortality that has occurred over the last six years.

Most of the mortality is comprised of lodgepole pine killed by mountain pine beetle (*Dendroctonus ponderosae*) and true firs killed by balsam woolly adelgid (*Adelges piceae*), fir engraver (*Scolytus*

ventralis), silver fir beetle (*Pseudohylesinus sericeus*), and western balsam bark beetle (*Dryocoetes confusus*). Mortality estimates are comprised, to a lesser extent, of other tree species including ponderosa pine, western white pine, whitebark pine, Douglas-fir, mountain hemlock and Engelmann spruce.

The number of acres in each mortality class for the Forest and adjacent lands are included in Table 2-19. Table 2-20 includes the number of acres in each mortality class for the Forest lands alone.

Table 2-19. Mortality Class for Mt. Hood National Forest and Adjacent Lands.

Dead Trees per Acre	Acres
1-4	125,844
5-9	23,398
10-24	30,945
25-49	12,601
+50	3,989
Total	196,777

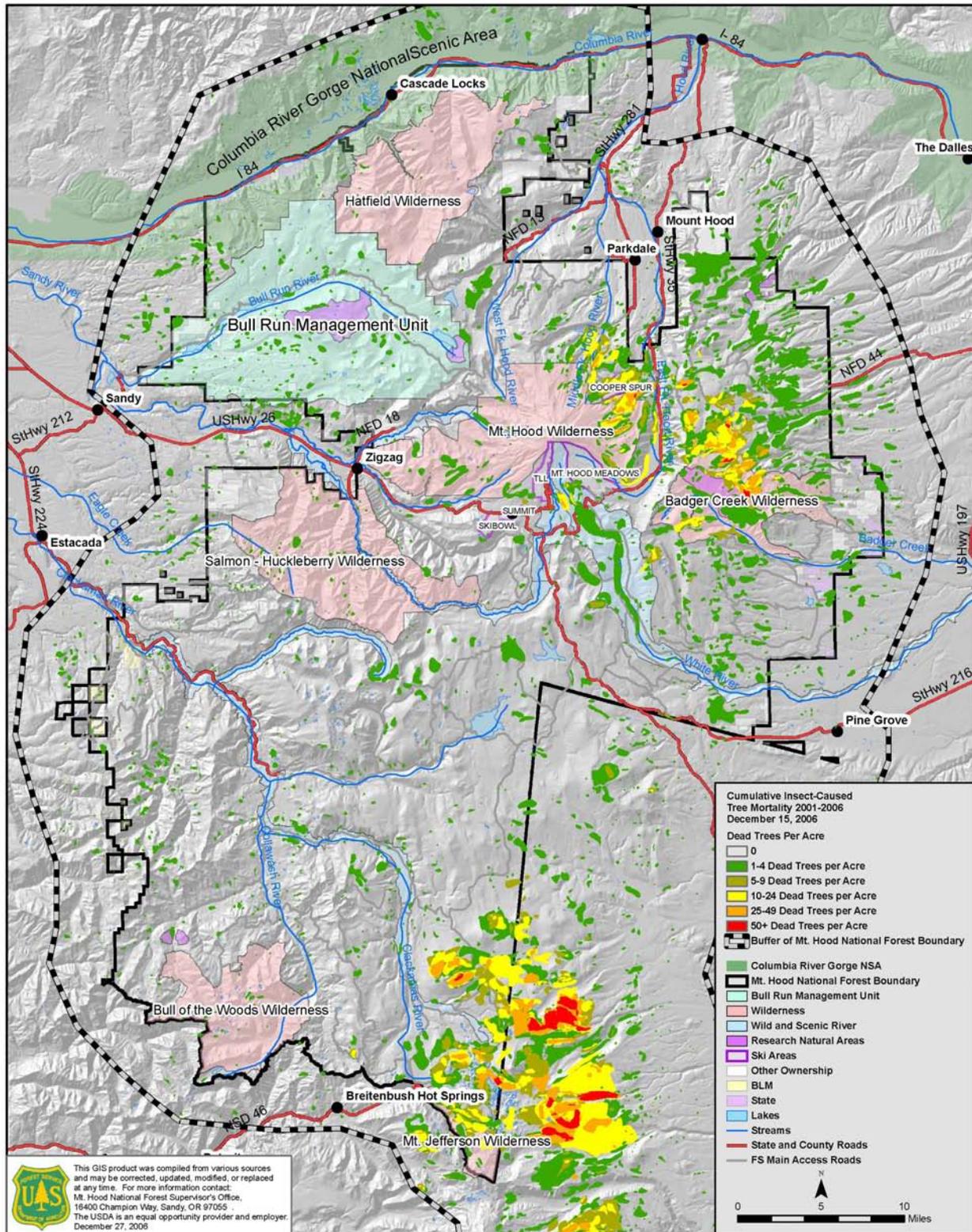
Table 2-20. Mortality Class for Mt. Hood National Forest Lands.

Dead Trees per Acre	Acres
1-4	80,651
5-9	12,655
10-24	14,001
25-49	5,268
+50	376
Total	112,951

Field checks and a limited number of studies indicate that aerial surveys underestimate actual mortality by approximately one third. Thus, the number of dead trees per acre should be considered a conservative estimate. Additional detailed information, including annual maps, accompanying data, and how the aerial survey is conducted, is located at: www.fs.fed.us/r6/nr/fid/as/.

Map 2-1. Tree Mortality Map FY 2001-2006.

Cumulative Insect-Caused Tree Mortality 2001-2006



Insect and Disease Concerns

The Forest has large amounts of susceptible host habitat of lodgepole pine and mixed conifer stands that regenerated after fire at the turn of the century. Beetle activity on the eastside remains high and is increasing along the western flank and the high plateau of the Cascade crest. Over the next few years, it is likely that additional stands of host trees will be killed by bark beetles until the host habitat is depleted.

Beetle killed lodgepole can provide a short-term food source for species, such as the black-backed woodpecker, which feeds on both the mountain pine beetle larvae and secondary wood borer larvae. The excavations are then used by small, cavity nesting birds. Large-scale infestations can also result in increased fuel loadings and increased concern over hazardous fuels. In appropriate land allocations, the salvage of beetle killed trees can provide wood products, firewood or biomass.

In addition, there are many acres of second growth ponderosa pine stands on the eastside of the Forest, which are at or above maximum stocking densities. These 35 to 40 year old ponderosa pine stands on the eastside are becoming imminently susceptible to bark beetle attack or will become susceptible within the next five to ten years.

In some areas large, old overstory ponderosa pines are at risk of being attacked and killed by western pine beetles, *Dendroctonus brevicomis*. These pines are particularly at risk if they are in areas with high stand densities due to lack of understory tree removal by either harvest or periodic fires. Thinning in these areas is necessary where this large structure is important on the landscape.

The western spruce budworm (*Choristoneura occidentalis*) is a defoliating insect that affected large acreages of Douglas-fir and true firs from approximately 1983 to 1993. Although there is little current budworm activity, the past outbreak caused some tree mortality, especially in the understory. These trees have now fallen and are contributing to increased fuel loadings. In some places, this is occurring where there is overstory mortality from bark beetles. As a result, there are continuous ladders of high fuel loadings from the forest floor to the standing dead fuels.

Defoliation in western larch along Road 44 near Bottle Prairie continues. This defoliation is caused by a combination of an insect, larch casebearer (*Coleophora laricella*), and two needle diseases, larch needle cast (*Meria laricis*) and larch needle blight (*Hypodermella laricis*). The effects of these defoliating agents are highly visible in the spring yet typically do not cause mortality; however, radial growth and resistance to other disturbance agents is reduced.

At the higher elevations, many of the whitebark pines are dying due to a combination of a non-native pathogen, white pine blister rust, *Cronartium ribicola*, and mountain pine beetle. Many of the whitebark pines are in designated Wilderness Areas on the Forest. There are efforts in the west to select for and propagate rust resistant seedlings for restoration in some areas. Rust resistant seedlings are not available as yet, and it is very difficult to plant and grow these trees at high elevations.

Also at higher elevations, balsam woolly adelgid, a non-native insect, is slowly killing the subalpine firs and significantly changing the makeup of these habitat types. There are no viable management options to reduce the effects of this insect on the subalpine fir habitats.

The northern-most part of the range of sugar pine is located on the Clackamas River Ranger District. A survey of these sugar pine populations was completed during the summer of 2006. In summary, the sugar pine exhibit severe decline due to blister rust and mountain pine beetle. There is very little regeneration, and the surviving regeneration is infected with blister rust. Re-establishing a new population with blister rust resistant seedlings has been recommended by the Area Geneticist. Sugar pine seedlings need to grow into full sun before they reach sapling size. Natural or created openings in the forest, as well as areas of very low tree stocking, could provide sufficient sunlight for planted seedlings.

Economic – Natural Capital

The natural capital of forests refers to the quantity and also quality of the forest resource. Changes in the quantity or condition of forest resource assets affects sustainability of the surrounding social and economic environment by affecting uses of the land and the types of jobs and income resulting from them. Capital investments and their management can greatly influence the short- and long-term impact a national forest can have on local communities. The Forest Plan monitors accomplishments of management practices programmed to contribute to future sale quantity. Examples of these capital investments/management practices

includes harvest methods, reforestation and timber improvement activities which contribute not only to future sale quantity, but to long-term productive capacity, timber growth, and other resource objectives which help to maintain sustainable conditions.

Harvest Methods

The Forest Plan tracks harvest methods being used to determine compliance with Forest Plan standards and guides which specifies a range of harvest methods should be considered and that resource objectives relating to harvest methods are being met.

Thinning is a cultural treatment made to reduce stand density of trees primarily to improve growth, enhance forest health, or recover potential mortality. The stands are thinned from below which removes trees from the lower crown classes leaving the tallest, largest, and fastest growing trees to meet desired objectives. To enhance biodiversity, the Forest is increasing the use of variable density thinning which includes species and structural diversity. Variable density thinning creates small openings, leaves unthinned patches, and varies the spacing between leave trees. Increased sunlight to the forest floor provides for a greater diversity of understory vegetation. Thinning prescriptions also emphasize retention of minor tree species, including the retention of some trees with elements of wood decay and live trees adjacent to key snags.

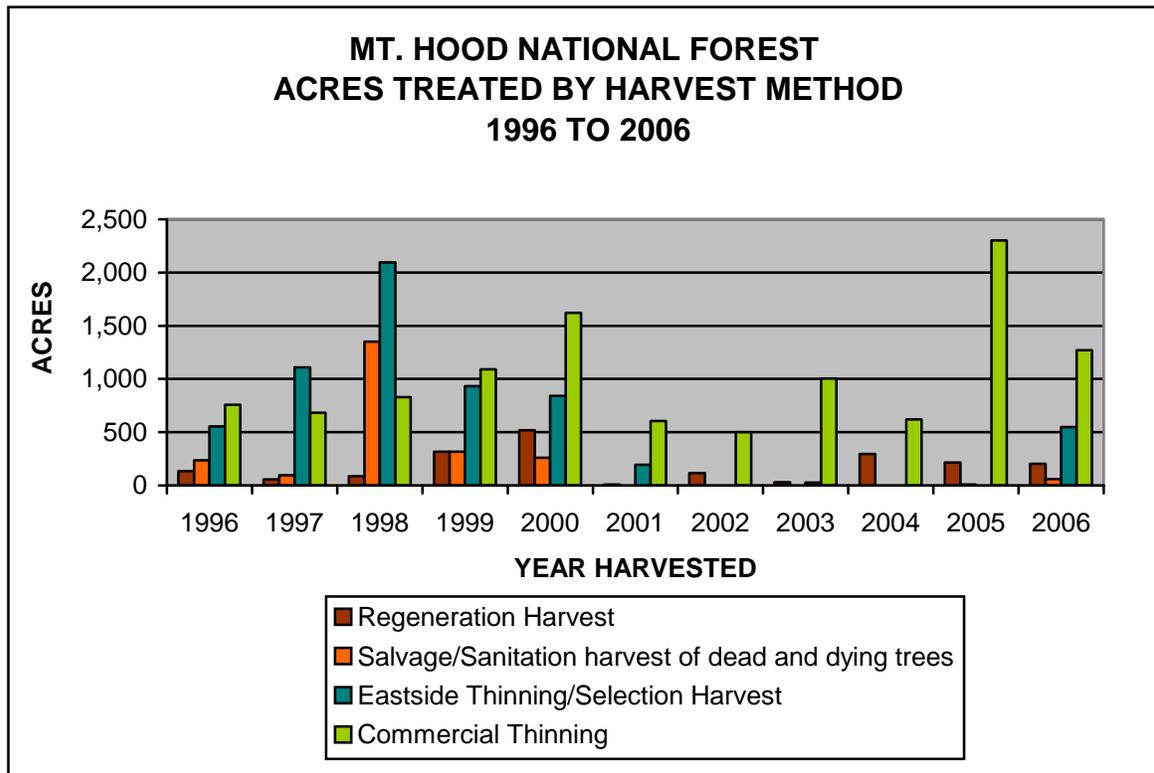
2006 Monitoring Report

Shelterwood harvest is a type of regeneration method in which some overstory trees are retained to provide a moderated environment for regeneration of a new age class. Typically, this method is used on the harsher sites of the Forest along the Cascade Crest, or on the drier sites on the eastside of the Forest. In a shelterwood with reserves, the overstory shelter trees are retained indefinitely to meet the green tree retention standards of the Northwest 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. Also, it is used for regeneration of shade intolerant species.

In 2006, commercial thinning was the harvest method on 61% of the acres, selection harvest 26%, clearcut with reserves (similar to shelterwood harvest) 10%, and salvage harvest on 3% of the acres. In the last decade, there has been an overriding shift from regeneration harvest to commercial thinning. Figure 2-2 displays harvest methods utilized over the last ten years. For example, more salvage harvest occurred in the late 1990's due to an increase in Douglas-fir beetle caused mortality that occurred after several wind events. Selection harvest and commercial thinning continue on the eastside of the Forest to lessen the susceptibility to forest insects and to reduce disease and hazardous fuels. On the westside, commercial thinning has increased as stands that were regenerated 30 years ago have grown to plantations of commercial size. Although there are large acreages of pine beetle caused tree mortality, there have only been 61 acres of salvage harvest.

Figure 2-2. Acres Treated by Harvest Method.



Year Harvested	Regeneration Harvest*	Salvage/Sanitation Harvest	Eastside Selection Harvest	Commercial Thinning
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
2004	297	0	0	620
2005	216	8	0	2,302
2006	203	549	61	1,270
10 Year Total	1,990 (9%)	2,823 (13%)	5,816 (27%)	11,285 (51%)

*includes shelterwood harvest and regeneration harvest with reserves

National Forest Management Act Reforestation Requirement

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 that planted trees species maintains genetic diversity and provides for compositional diversity similar to that existing naturally for the planning area with considerations for natural regeneration.

The Forest accomplished 419 acres of reforestation in FY 2006. Reforestation continues on a downward trend which is directly related to the decreased level of regeneration harvest and the decreased level of timber harvest overall. Some eastside units 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 increases the structural diversity within a stand. Four conifer species were planted: Douglas-fir, ponderosa pine, western white pine, and noble fir. Frequently western larch and sometimes lodgepole pine are planted as well depending upon the site. All of the acres planted were with seedlings from known seed sources and genetically diverse seed lots. The western white pine was planted from stock that is resistant to white pine blister rust, thus enabling restoration of this species.

The overall first year survival of the planted seedlings was very high at 89% - 94% survival. The noble fir seedlings on the westside had a lower survival percentage, but the survival of noble fir on the eastside was very high. The third year survival of planted seedlings was very good as well, 74% - 87%. The Douglas-fir on the westside had a lower survival rate, but again was high on the eastside.

Based on initial survival and stocking surveys, and expectations for continuing in-growth from natural regeneration, the five-year regeneration requirement should be met on all units; although, some of the sites on the eastside will need continuing pocket gopher control or additional inter-planting.

There remains an existing reforestation need of 793 acres. This includes acres that have not yet reached satisfactory stocking and new acres generated from timber harvest and wildfire. As a result of wildfires in 2006, there was a need to reforest approximately 135 acres. Further field review in 2007 of the burn areas may increase this figure.

Figure 2-3. Reforestation Accomplishments.

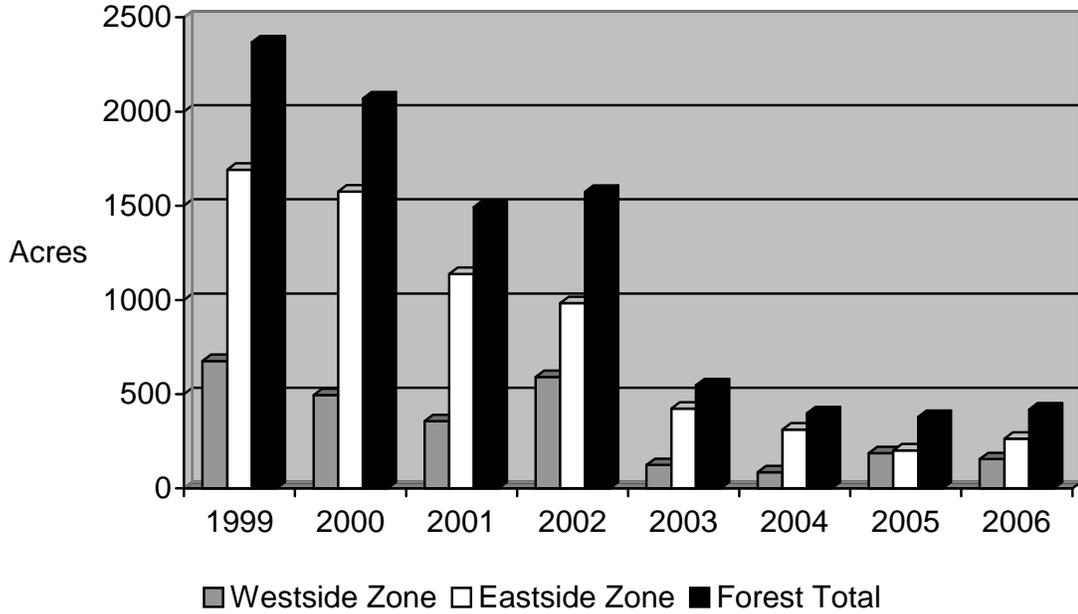
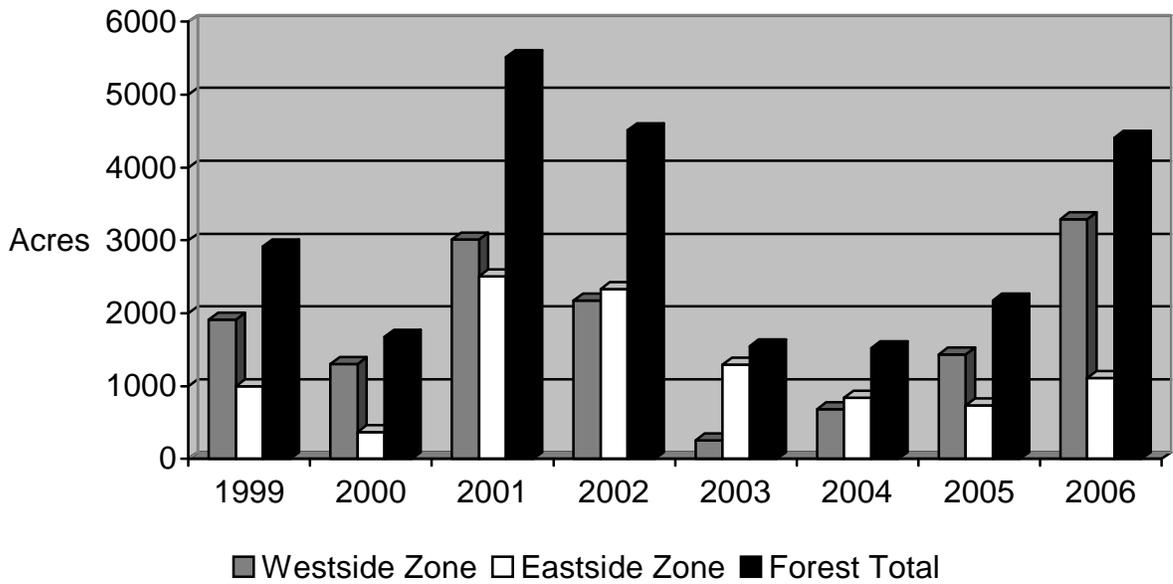


Figure 2-4. Stand Improvement Activities.



Stand Improvement Activities

Stand improvement activities are monitored as they contribute to the future allowable sale quantity and increase long-term capacity of forest land by promoting healthy stand conditions and growth. They include pre-commercial thinning, pruning, and fertilization. Pre-commercial thinning (PCT) can greatly influence the future trajectory of the stand in terms of species composition as well as 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.

Pre-commercial thinning needs continue to increase on the Forest as stands regenerated 10 to 20 years ago have grown to the size where thinning treatments are needed. In FY 2005, and as requested by Congress, each National Forest reviewed, validated and signed a Certification of Data Accuracy for their young stand improvement and reforestation needs. The stand improvement need for the Forest amounted to 18,985 acres. Fertilization and pruning needs were decreased to reflect the funding priority to PCT and changes in management emphasis. Fertilization for bough production was included because there is a strong market for boughs as a special forest product.

In FY 2006, the Forest accomplished 4,405 acres of young stand or PCT. This is more than double the amount of acres pre-commercially thinned in FY 2005 due to the use of Stewardship Contracting authorities and Payments to the Counties funding. Of the total, 2,785 acres of PCT was funded through Title II of the Secure Rural Schools and Community Self-Determination Act (Payments to the Counties or PAYCO). Counties included Clackamas and Wasco. In addition, through stewardship contracting authorities and dollars generated from the timber harvest, another 1,284 acres were pre-commercially thinned. Both PAYCO and Stewardship Contracting have become very important funding sources for the PCT program. Appropriated funding in the region has emphasized reforestation, notably after the large scale fires on other forests over the last several years. As a result, only 296 acres of PCT was funded through the appropriated budget. Forty acres of PCT was accomplished through the K-V funding associated with timber sales. A stable funding source will be necessary to maintain a productive young stand thinning program and reduce the backlog of acres needing thinning.

Economic – Providing a Sustainable and Predictable Supply of Forest Products

Harvest Rates by Management Allocation

The Forest Plan monitoring report tracks the amount of acres harvested within each of the management areas to help determine if Forest Plan assumptions used to estimate the effects of standards and guides on timber harvest are appropriate. As displayed in the following tables, 34% of the 2006 harvest occurred in C1 timber emphasis and 66% occurred in category B allocations where timber production is a secondary goal. For 2006, these include B2 scenic viewshed, B6 special emphasis watershed, B8 earthflow area, and B11 deer and elk summer range (see Tables 2-21 and 2-22).

Table 2-21. Percent of Acres Harvested by Management Area Category.

Fiscal Year	Mt. Hood National Forest Land Allocations			
	A	B	C	D
1996	0.8	68.9	30.3	0.0
1997	4.5	40.9	54.6	0.0
1998	11.0	41.0	48.0	0.0
1999	0.0	33.7	66.3	0.0
2000	2.0	29.0	69.0	0.0
2001	1.0	28.0	71.0	0.0
2002	0.0	60.0	40.0	0.0
2003	13.0	37.0	50.0	0.0
2004	0.0	47.0	53.0	0.0
2005	5.0	25.0	70.0	0.0
2006	0.0	66.0	34.0	0.0

Supply of Commercial Forest Products

The 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. The current PSQ for the Forest is 64 MMBF.

In FY 2006, the budget allocation scheduled the Forest to offer for sale approximately 24.5 MMBF (38.3% of PSQ), which was a 10% increase over FY 2005. The Forest successfully offered for sale approximately 27.9 MMBF (43.6% of PSQ). This was accomplished using ten separate timber sales and two stewardship contracts. The two stewardship contracts “best value” bid, resulted in the revenue source which will accomplish approximately \$424,000 in restoration projects, such as fuel reduction projects around Sportsmans Park and road decommissioning on the Clackamas River Ranger District, as well as \$50,000 of retained receipts for future restoration projects. The Forest also made significant progress on planning projects that accomplish wildfire risk reduction objectives and commercial thinning in overstocked plantations. These planning efforts will result in timber sales and stewardship contracts in FY 2007.

2006 Monitoring Report

Table 2-22. Acres Harvested by Forest Plan Management Area in FY 1996-2006.

Management Area		96	97	98	99	00	01	02	03	04	05	06
A4	Special Interest Area	14	13	372	0	19	0	0	0	0	0	0
A5	Unroaded Recreation	0	0	0	0	0	0	0	149	0	0	0
A6	Semi-primitive Roaded Recreation	0	0	0	0	0	0	0	0	0	0	0
A7	Special Old Growth	0	0	95	0	0	0	0	0	0	0	0
A9	Key Site Riparian	0	75	0	0	15	11	0	0	0	126	0
A10	Developed Recreation	0	0	14	0	0	0	0	0	0	0	0
A11	Winter Recreation Area	0	0	0	0	0	0	0	0	0	0	0
A12	Outdoor Education Area	0	0	0	0	0	0	0	0	0	0	0
A13	Bald Eagle Habitat	0	0	0	0	39	0	0	0	0	0	0
B1	Designated Wild & Scenic Rivers	20	11	0	0	0	0	0	0	0	0	0
B2	Scenic Viewshed	597	197	876	206	80	70	182	280	189	106	741
B3	Roaded Recreation	0	0	0	0	1	0	0	0	0	0	0
B4	Pine Oak Habitat Area	98	268	366	282	62	0	0	0	0	60	0
B6	Special Emphasis Watershed	70	62	169	191	64	0	95	0	0	14	545
B8	Earthflow Area	347	119	191	106	238	74	23	0	151	123	76
B9	Wildlife/Visual Area	26	136	0	0	0	0	0	0	0	0	0
B10	Winter Range	3	0	156	112	163	0	0	0	0	181	0
B11	Deer and Elk Summer Range	0	0	23	0	352	79	74	91	82	141	21
B12	Back Country Lakes	0	3	0	0	0	0	0	0	0	0	0
C1	Timber Emphasis Area	510	1,064	2,104	1,762	2,257	574	246	509	485	1774	700
DA1	Bull Run Physical Drainage	0	0	0	0	0	0	0	0	0	0	0
DA3	Bull Run Research Natural Area	0	0	0	0	0	0	0	0	0	0	0
DB8	Bull Run Earthflow Area	0	0	0	0	0	0	0	0	0	0	0
DC1	Bull Run Timber Emphasis Area	0	0	0	0	0	0	0	0	0	0	0
Total		1,685	1,948	4,366	2,659	3,299	808	620	1029	917	2,525	2083

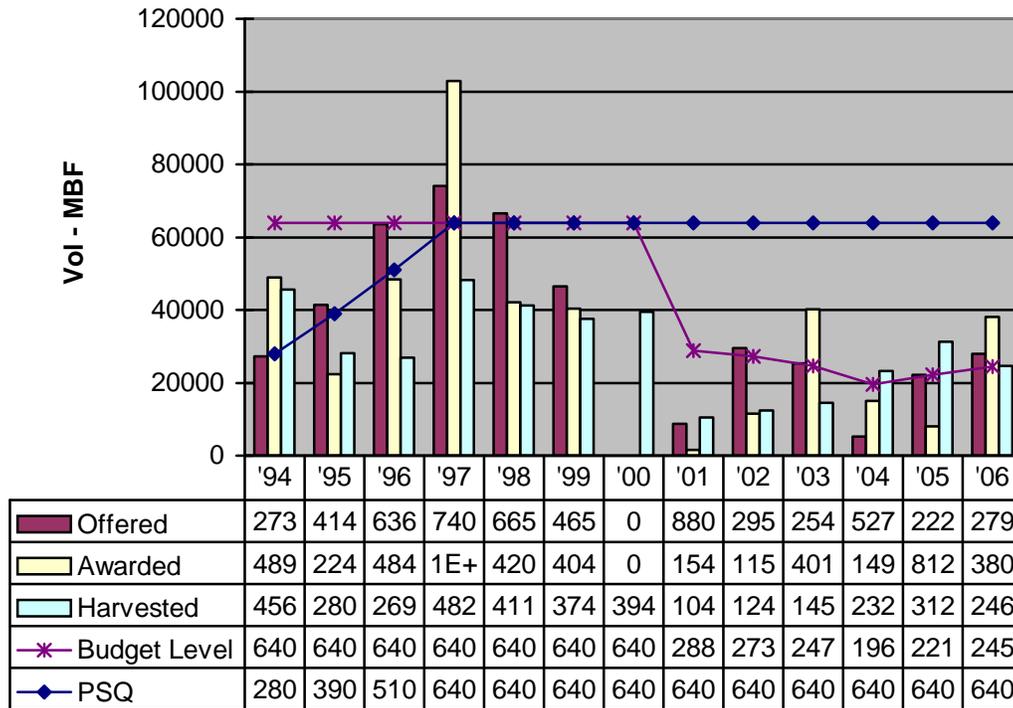
Regional Economic System

Since the early 1990’s and the listing of the spotted owl and as a threatened species, harvest levels of commercial forest products from the Forest have dropped significantly. There used to be nine to eleven local mills that bought most of the timber sales. Today, there are approximately five local mills in existence. 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, many of our purchasers are log buyers or loggers who do not own mills themselves. In FY 2006, a large portion of the wood harvested from the Forest ended up in local mills within Hood River and Clackamas County.

These mills are efficient at processing the small logs generated from many of our recently sold timber sales. Pulp prices were exceptionally high in FY 2006 so many of the smaller diameter material was utilized for pulp and shipped as far away as Longview, WA. In FY 2006, all timber sale and stewardship contracts included a provision, which would allow the purchaser or contractor to remove biomass if a market developed.

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. Over the last two years the Forest has been providing a more “predictable” supply of forest products to the region than it has in the past.

Figure 2-5. Timber Sold and Harvested.



Future Expectations

Sustaining a predictable supply of forest products to the region’s economic system through silvicultural treatments, such as thinning and fuel reduction treatments, is interrelated to the ecological system. Thinning and fuel reduction operations maintain healthy forest, reduce fire hazard/fuel build up, improve wildlife habitat, and restore riparian habitat. 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. They may also provide biomass for energy production in the future.

The best information we have at this time projects the Forest to plan and sell approximately 30 MMBF per year for FY 2007-2008. 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 2007-2008, the Forest expects 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. These products will be sold using our standards timber sale contracts as well as the new Integrated Resource Stewardship contracts. The Forest continues to plan, prepare and administer timber sales and stewardship contracts 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.

Supply of Special Forest Products

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 2-23. Mt. Hood National Forest Special Forest Products Sold and Harvested in FY 2006.

	Number Sold and Harvested	Value
Firewood Permits	1090	\$26,840.00
Christmas Trees	5036	\$25,148.50
Bough Permits	10	\$661.25
Beargrass Permits	956	\$32,205.00

Future Expectations

Future budget levels for the Special Forest Product programs are expected to be similar to FY 2006. Demand for these products, which provide recreational opportunities, are expected to increase as the nearby population grows. 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 arises. 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.

Recommendations

- The vegetation management program should continue planning efforts to meet desired land management objectives and to provide a predictable supply of commercial forest products. This includes salvage harvest of mortality from bark beetles, thinning or small group selection harvest of eastside stands with insect and disease concerns; thinning of stands in Late Successional Reserves to accelerate development of late successional structure; and thinning commercial size plantations on the westside that both provide forest products and increase the biodiversity and complexity of the stands.
- Continue to 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.
- Assess those areas where there are high levels of insect caused tree mortality and pursue salvage sales or fuels reduction activities where appropriate.
- Reduce stocking of ponderosa pine stands imminently susceptible to bark beetles.
- Continue to pursue a mix of funding sources to accomplish the back-log of young stand thinning since appropriated funding region-wide will continue to be prioritized for post fire reforestation.
- Consider active restoration of sugar pine and whitebark pine populations.

Chapter 3
Financial Review

Chapter 3

Financial Review

The purpose of this monitoring item is to track funding levels necessary to achieve the outputs predicted in the Forest Plan. The following display compares expenditures proposed in the 1990 Forest Plan with actual expenditures for Fiscal Year 2006 (October 1, 2005 to September 30, 2006). All figures are rounded to the nearest thousand dollars.

The total budget predicted for full Forest Plan Implementation was \$72,142,108; actual funds expended in FY 2006 were \$19,867,108. Additional funding was received in FY 2006 for roads, trails and bridges. Also, additional funding was received for salvage and timber to attain the timber targets and to prepare for FY 2007 projects. Multiple combinations of funding categories have occurred during the last few years, which makes tracking specific program areas difficult. General trends in major resource areas, however, are evident. 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 Forest 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 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 where a budget shortfall is a material factor causing the Forest Service to move more slowly to meet Forest Plan objectives, it is noted in the narratives for the specific program.

2006 Monitoring Report

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

Activities	*Forest Plan Predicted (thousands/yr)	** Actual Expenditures (thousands)									
	1990	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	FY06
Fire											
Brush Disposal	3,056	632	426	547	346	402	228	256	273	238	276
Fire Fighting Fund	2,118	2,520	2,187	2,173	2,227	2,535	2,949	2,040	2,139	1,888	1,975
Engineering											
Timber Roads	2,709	518	586	1,015	930						
Facilities Maintenance	478	230	264	375	357						
Recreation Roads	1,381	103	104								
General Purpose Roads	118	151	16								
Recreation Facilities	1,751	499	599	152	419						
Trail Construction	1,279	534	346	383	174	698	484	424	711	609	522
Road Maintenance	4,079	1,139	965	943	747	2,270	1,795	2,613	1,729	1,938	1,191
Rec & Eng Facilities						1,042	1,201	1,828	1,117	828	732
Timber											
Salvage Sale Funds							737	752	789	772	888
KV Funds		4,696	2,501	2,950	4,346	3,827	1,268	553	477	612	1,298
Forestland Vegetation					1,241	709	756	570	614		
Genetic Tree Improvement	9,602	4,216	2,925	2,890	1,820						
Restoration/Timber Stand Improvement	2,792	2,331	1,855	1,481	1,170						
Timber Sale Management	5,270	2,465	3,798	2,909	2,210	2,071	3,660	1,250	1,110	1,191	1,521
Sale Administration											
Sale Preparation											
Silvicultural Exams											
Administration	3,318	1,276	1,479	1,095	898						
General Administration											
Recreation/Lands											
Land Acquisition	50	128	23	8							
Cultural Resources	459	78	90	83	59						
Land Line Location	10										
Recreation	5,924	1,692	2,021	1,640	1,983	1,865	2,111	1,508	1,282	1,158	1,318
Fish/Wildlife/Range/Soil/Water											
Fish-Anadromous	986	491	557	584	667	1,412					
Fish-Inland	365	92	141	161	110						
Wildlife	809	224	256		302	237					
Threatened, Endangered Species	642	154		188	155						
Range Betterment	4	1		1		1	1				
Soil Inventory	112	30		128	69	120					965
Range Vegetation Mgmt	73	18	23	27	31						49
Soil/Water Administration	1,726	289	296	271	108						
Ecosystem Management		999	888	439	846	1,242	1,077	746	1,053	989	690
Fish/Wildlife/Soil/Water							1,657	1,381	1,049	1,125	1,068

* 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.

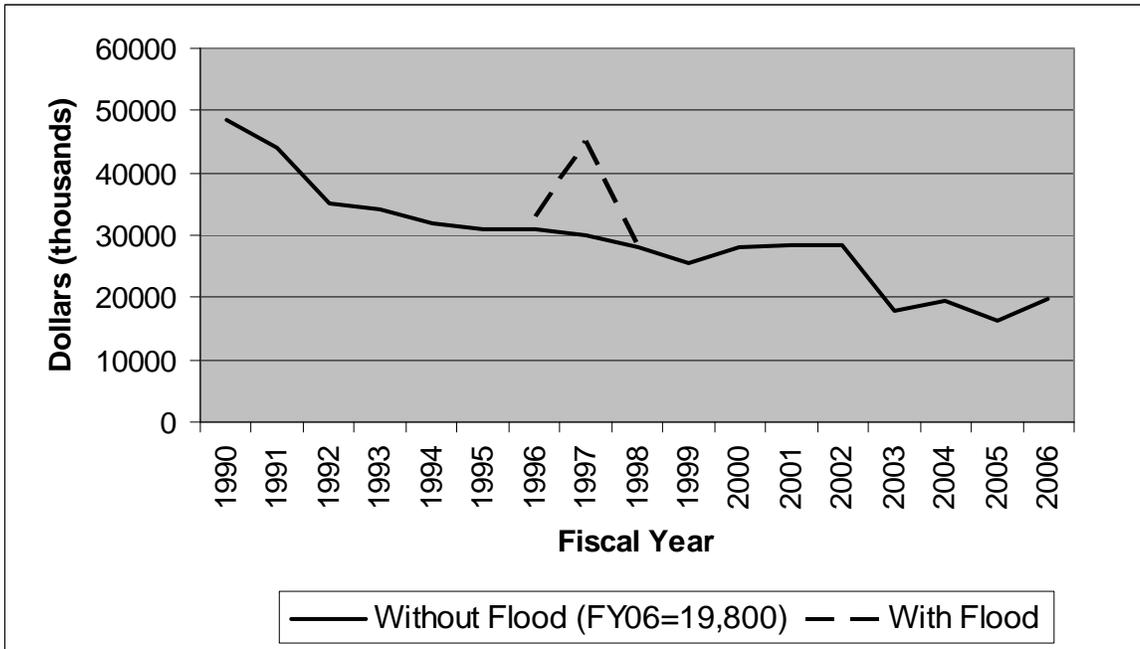
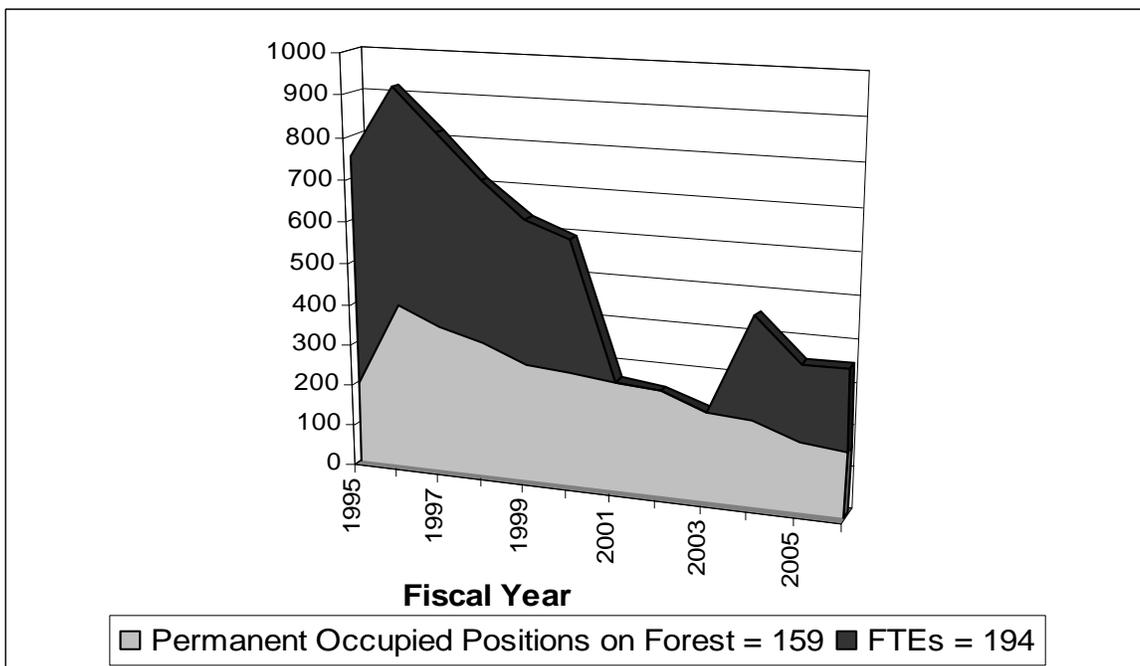


Figure 3-2. Mt. Hood National Forest FTE/Position Usage.*



* No FTE data available for FY 2002 and FY 2003

Chapter 4
*Forest Plan Amendments/
Interpretation Process*

Chapter 4

Forest Plan Amendments/ Interpretation Process

As the Forest continues 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 the Forest Service is 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 (NFMA) regulations and the Northwest Forest Plan Standards and Guidelines.

Amendments

An important aspect of keeping the Forest Plan an up-to-date living document is the preparation of amendments. Based on analysis of objectives, standards, monitoring, and 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.

2006 Monitoring Report

As of September 30, 2005, fourteen amendments have been made to the Forest Plan. Five amendments reflect changes made during Wild and Scenic River planning; two concern invasive plant (noxious weed) management; one adjusts a Research Natural Area Boundary; one responds to Elk Habitat Enhancement needs; one deals 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 expands Mt. Hood Meadows ski area permit boundary; one Congressional Act modifies activities within the Bull Run watershed; one designates Timberline Lodge and its immediate environs (approximately five acres) as a Historical Special Interest Area (A-4); and one changes the visual quality objective for roads near Timberline Lodge.

Two additional amendments have been proposed. Amendment thirteen has been proposed, but the implementing decision was recalled during the appeal process and has not yet been reissued. This amendment would modify Standards, Guidelines and Management actions related to the use and management of the Mt. Hood, Salmon-Huckleberry, and Hatfield Wildernesses. Amendment sixteenth has been proposed, but the implementing decision has not been finalized; the decision is expected in spring 2008. This amendment would allow for careful and targeted herbicide use to treat invasive plants.

The sixteen amendments are:

1. October 3, 1991. ***Big Bend Mountain Research Natural Area.*** This amendment changes the boundary within the Bull Run Watershed.
2. March 10, 1993. ***Salmon Wild and Scenic River Environmental Assessment and Management Plan.*** This amendment delineates final river boundary and eliminates “regulated” timber harvest within the corridor.
3. April 19, 1993. ***Clackamas Wild and Scenic River Environmental Assessment and Management Plan.*** This amendment delineates final river boundary and removes all National Forest System land within the river corridor from “regulated” timber harvest.
4. May 17, 1993. ***Lemiti Elk Habitat Enhancement Project.*** This amendment exchanges an existing Roded Recreational Management Area at Lemiti Creek with an adjacent Deer and Elk Summer Range Management Area.
5. September 13, 1993. ***Roaring National Wild and Scenic River Environmental Assessment and Management Plan.*** This amendment delineates final river boundary and modifies management direction within the corridor relating to recreational developments, timber harvest and commercial livestock grazing.

6. December 8, 1993. ***Environmental Assessment for Management of Noxious Weeds, Mt. Hood National Forest.*** This amendment clarifies noxious weed management objectives by adding missing statements pertaining to noxious weed management under Goals, Desired Future Condition and Resource Summary sections of the Forest Plan.
7. February 24, 1994. ***Upper Sandy National Wild and Scenic River Environmental Assessment and Management Plan.*** This amendment delineates final river boundary and eliminates “regulated” harvest within the corridor. It provides replacement management direction for the new A-1 allocation.
8. May 13, 1994. ***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 land allocations and standards and guidelines.
9. November 3, 1994. ***White River National Wild and Scenic River Management Plan.*** This amendment 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.
10. 1996. ***The Oregon Resource Conservation Act of 1996 Changed the Allocation for the Bull Run Area from Administratively Withdrawn to Congressionally Withdrawn.*** This amendment prohibits harvesting of trees for timber management within the Bull Run drainage and prohibits the authorization of salvage sales.
11. January 24, 1997. ***The Environmental Impact Statement for the New Long Term Conceptual Master Plan for Mt. Hood Meadows Ski Area.*** This amendment expands the ski area permit boundary by 96 acres to include an area which was being used by the ski area. It changes the land allocation for this area from a Wildlife/Visual classification to Winter Recreation classification. It also changes the Northwest Forest Plan allocation from Matrix to Administratively Withdrawn.
12. November 4, 1998. ***The Timberline Lodge Master Development Plan Amendment.*** This amendment adopts the Historic Building Preservation plan to provide the long-term management strategy for Timberline Lodge as a National Historic Landmark. The amendment also designates Timberline Lodge and immediate environs as a (Historic) Special Interest Area (A-4 Land Allocation).

13. December 11, 2000. ***Wilderness Recreation Spectrum allocations and Forest Plan standards.*** This amendment would make 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 are adjusted.
- Note:** This decision was recalled based on information identified during the administrative appeal process. A new decision has not yet been issued and the amendment has not been implemented.
14. October 11, 2005. ***Pacific Northwest Region Invasive Plant Program – Preventing and management Invasive Plants Record of Decision.*** This amendment adds invasive plant management direction, including invasive plant prevention and treatment/restoration standards intended to help achieve stated desired future conditions, goals and objectives. The management direction is expected to result in decreased rates of spread of invasive plants, while protecting human health and the environment from the adverse effects of invasive plant treatments.
15. November 1, 2005. ***Timberline Express Final Environmental Impact Statement.*** This amendment revises the Visual Quality Objective (A11-017 and A11-020) from “Partial Retention” to “Modification” in the foreground, as viewed from Timberline Highway (Highway 173), West Leg Road (Road 2645), Timberline Road, and riparian areas within the Timberline Special Use Permit area. This change increases the percent of the seen area visually disturbed at any one time.
16. ***Site-Specific Invasive Plant Treatments for Mt. Hood National Forest and Columbia River Gorge National Scenic Area in Oregon.*** This amendment allows, where appropriate, careful and targeted herbicide use to treat invasive plants according to the Pacific Northwest regional standards and in accordance with the project design criteria. This amends six existing Forest Plan standards and guidelines that discourage or prohibit the use of pesticides, including herbicides. These standards and guidelines were not amended under the new management direction provided by Amendment #15.
- Note:** The implementation decision has not been made; the decision is expected in spring 2008.

Monitoring has disclosed significant disparity between the amended 1994 Forest Plan projections and existing forest conditions that would currently warrant a revision at this time. The Forest Service will continue to make non-significant amendments to the Forest Plan as needed as the Forest Service looks forward to a full Forest Plan revision.

Chapter 5
Ongoing Planning Actions

Chapter 5

Ongoing Planning Actions

The Forest Plan as well as the Northwest Forest Plan implementation process is now well underway. As the Forest moves further into the implementation phase, the Forest is doing its 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 Forest 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 below.

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 from the Forest Plan and the Northwest Forest Plan, watershed analysis is a tool to help identify and prioritize Forest Plan implementation actions.

Nearly 100% of the Forest has been covered by an initial watershed analysis. The watershed analyses are completed by fifth field watersheds. In the State of Oregon, there are 1,063 fifth field watersheds, with an average size of 58,218 acres. The boundaries of the watersheds were changed to make the watershed sizes more consistent; this process was completed in 2005. Table 5-1 indicates the new watershed names and the applicable watershed analysis. All fifth field watersheds that include Forest land are illustrated in Figure 5-1.

The Forest is now updating/revising watershed analyses where changed management priorities, changed natural conditions, or inherent risk factors were not reviewed in the first watershed analysis efforts of a decade ago. In 2006, the final Miles Creek Watershed Analysis Update was completed. The Update focused on two key sections:

- Chapters 2, 3, and 4, taken together look at past and present aquatic conditions, desirable conditions and trends, restoration projects, and monitoring recommendations that can improve ecosystem health in the watershed. Chapter 2 will serve as a Water Quality Restoration Plan (WQRP) for the Miles Creeks Basin. This WQRP is prepared to meet the requirements of Section 303(d) of the 1972 Federal Clean Water Act.
- Chapters 5, 6, and 7 focus on significant tree mortality and resulting fuels situation in the forested part of the watershed. Intertwined with the fuels condition is the updated wildlife section that illustrates the major changes in how the Forest Service thinks about snags and down woody debris across the forested landscape.

Additionally in 2006, the Forest Service portion of the Gordon Creek Watershed Analysis was completed in conjunction with the Bureau of Land Management's Lower Sandy Watershed Analysis.

Table 5-1. Fifth field watersheds containing Mt. Hood National Forest lands and the applicable watershed analysis.

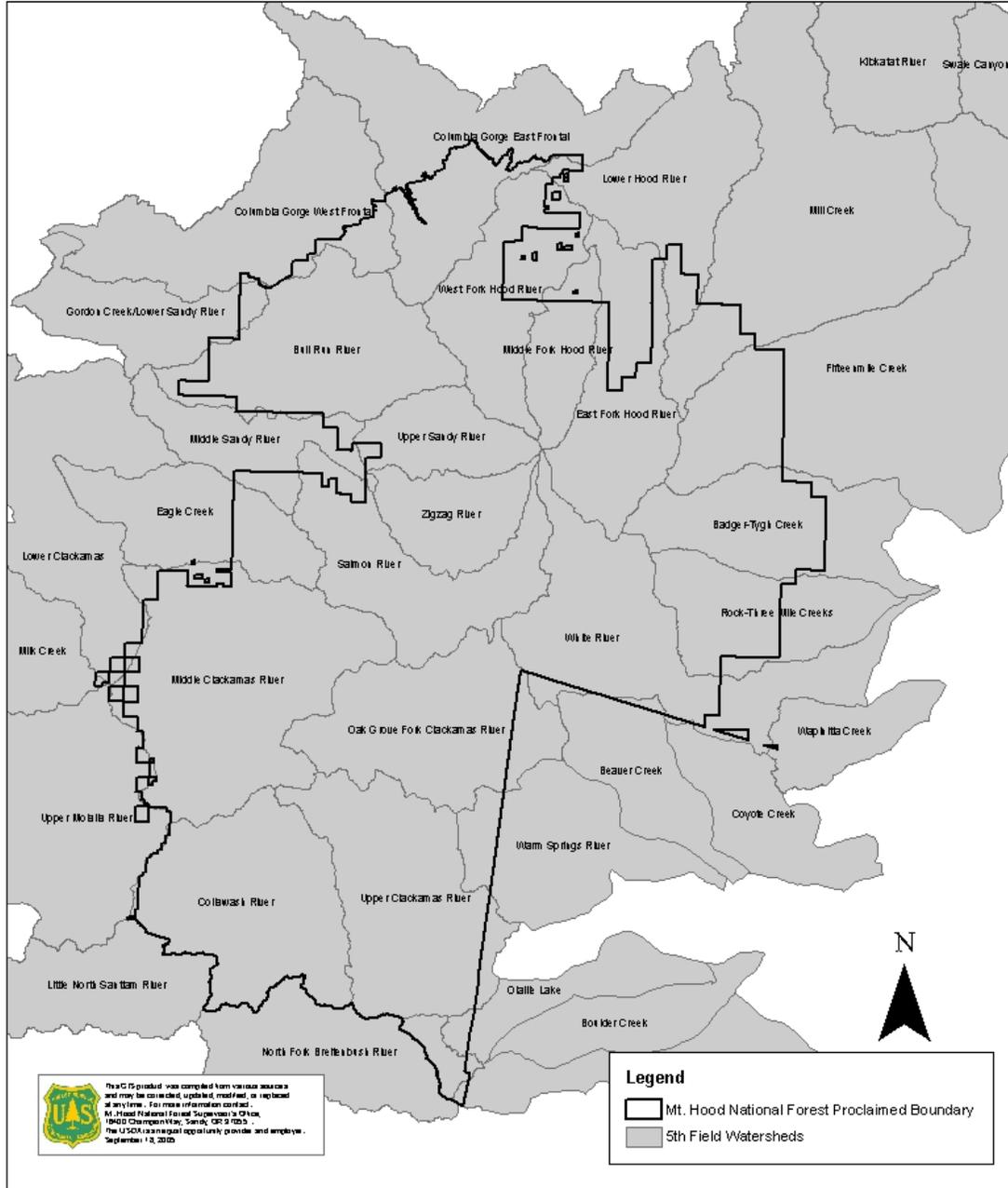
5th Field Number	5th Field Watershed Name	Applicable Watershed Assessment(s) *	Year Completed
1707010502	Fifteenmile Creek	Mile Creeks	1994
1707010503	Fivemile Creek	Mile Creeks	1995
1707010504	Middle Columbia/Mill Creek	Mill Creek	2000
1707010505	Mosier Creek	Mosier (Wasco County SWCD)**	2002
1707010506	East Fork Hood River	East Fork Hood River & Middle Fork Hood River	1996
1707010507	West Fork Hood River	West Fork of Hood River	1996
1707010508	Lower Hood River	Hood River (Hood River SWCD) **	1999
1707010512	Middle Columbia/Grays Creek	Hood River (Hood River SWCD) **	2000
1707010513	Middle Columbia/Eagle Creek	Columbia River Tributaries East	1998
1707030604	Mill Creek	Olallie Lake	1997
1707030607	Middle Deschutes River	White River	1995
1707030609	Tygh Creek	White River	1996
1707030610	White River	White River	1997
1708000101	Salmon River	Salmon River	1995
1708000102	Zigzag River	Zigzag	1995
1708000103	Upper Sandy River	Upper Sandy	1996
1708000104	Middle Sandy River	Upper Sandy	1997
1708000105	Bull Run River	Bull Run River	1997
1708000107	Columbia Gorge Tributaries	Columbia River Tributaries East	1998
1708000108	Lower Sandy River	Oregon Columbia River Tributaries West	1999
1709000505	Little North Santiam River	Collawash/Hot Springs	1995
1709000905	Upper Molalla River	South Fork Clackamas River	1997
1709001101	Collawash River	Collawash/Hot Springs	1995
1709001102	Upper Clackamas River	Upper Clackamas River	1995
1709001103	Oak Grove Fork Clackamas River	Clackamas River - Oak Grove Fork	1996
1709001104	Middle Clackamas River	Fish Creek (1994), Lower Clackamas River (1996), North Fork Clackamas River (1996), Roaring River (1996), South Fork Clackamas River (1997)	1994-97
1709001105	Eagle Creek	Eagle Creek	1995
1709001106	Lower Clackamas River	Lower Clackamas River	1996
1708000128	Gordon Creek	Gordon Creek	2006

* Watershed Assessments prepared by the Mt. Hood National Forest are available at: <http://www.fs.fed.us/r6/mthood/publications/>.

** Watershed Assessments prepared by local Soil & Water Conservation Districts (SWCD)

Map 5-1. Fifth Field Watershed Map.

Map of Fifth Field Watersheds on Mt. Hood National Forest



Restoration

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

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

Additional 2006 restoration projects completed with volunteers, partners, and other agencies are:

- Lake Branch Riparian Thinning. In cooperation with the Confederated Tribes of Warm Springs and Oregon Department of Fish and Wildlife, a riparian stand along Lake Branch was thinned to improve stand structure and riparian area vegetation. The thinning project will provide future nutrients and large wood structure to the stream channel and forest floor. Logs thinned from the stand were hauled to the West Fork Hood River to contribute to a forest stream restoration project implemented by the Confederated Tribes of the Warm Springs. Remaining logs were stored for future projects in the Hood River Basin.
- Round, Fish and Shining Lakes. In cooperation with Trout Unlimited, this project was used to control off-highway vehicle and dispersed recreation impacts that negatively impact five acres of lake and lake-side riparian habitat at three lakes that are inaccessible from designated roads. The objective is to maintain these currently roadless lakes as high quality, popular fishing destinations with functioning and intact riparian and pristine aquatic habitat.
- The Catlin Gabel School. In its seventeenth year of a long-term partnership with the Barlow Ranger District, the school has helped plan and implement various watershed restoration and protection projects in the Rock Creek and surrounding drainages including tree pruning, prescribed fire site preparation, brushing future fence line, seeding, and fencing. Additionally, each year various classes from Catlin Gabel take on additional projects as part of their commitment to community service.

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, 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.

Secure Rural School and Community Self- Determination Act of 2000

This Act addresses the decline in revenue from timber harvest in recent years received on Federal land, which have historically been shared with counties. For each year from 2001 to 2006, the law allows counties to receive a payment from the Federal government based on the State average of their top three years of payments from Federal lands.

The purpose of the Act is to stabilize payments to counties that help support roads and schools; provide projects that enhance forest ecosystem health and provide employment opportunities; and improve cooperative relationships among Federal land management agencies and those who use and care about the lands that the Forest Service and BLM manage. These projects, referred to as Title II Projects on Federal Lands, are reviewed and recommended to the Secretary of Agriculture by Title II Resource Advisory Committees (RACs).

Public Law 106-393 creates a mechanism for local community collaboration with federal land managers in recommending projects to be conducted on federal lands or that will benefit resources on federal lands. These RACs are balanced and diverse with equal representation from industry, environmental groups, elected officials, and local people.

The following projects were recommended for funding, approved and completed in FY 2006:

Chapter 5 – Ongoing Planning Actions

Clackamas River Precommercial Thinning - three units, Clackamas County - \$78,240, \$66,395, \$62,740

The objective of this project was to optimize the growth of young trees in 10-20 year old plantations by thinning to a spacing that retains 200-300 trees per acre. Three of the projects were completed for a total of 1000 acres treated.

Government Camp Fuel Reduction, Clackamas County - \$81,440

This project created a fuel break in areas surrounding the community of Government Camp, and will serve as protection for the forest land and residential areas in the case of wildfire.

Abbott Woodcutting Area, Clackamas County - \$5,060

Funding paid a professional timber faller to cut designated trees in designated woodcutting areas to provide approximately 300-400 cords of firewood for public consumption. This reduced public hazards associated with timber falling.

Peavine Firewood, Clackamas County - \$14,400

In proposed units from a previously dropped timber sale, designated trees were felled and skidded to roadsides for removal under public wood cutting programs. This project improved the health of the stand, reduced fuel loading and provided a scarce fire wood source for local communities.

Wildcat Mountain Road Repairs and Restoration, Clackamas County - \$84,375

The goal of this project is to repair major damage along Forest roads in the Wildcat Mountain area caused by OHV's. Illegal OHV use is causing significant safety hazards and resource damage. Illegal user-created OHV routes will be closed that lead to wilderness areas and to municipal watershed areas.

Hood River Watershed Restoration Project Inventory, Hood River County - \$28,500

The goal of this inventory is to identify and prioritize restoration projects in the Lower Hood River and East Fork Hood River Fifth Field Watersheds that can be included in future NEPA analysis and funding proposals. This inventory is now underway.

Japanese Knotweed Survey, Eradication and Environmental Education, Hood River County - \$50,000

This project coordinated efforts between Hood River County, State and Federal funds and efforts to eradicate a recent invasion of Japanese Knotweed in Hood River County before the noxious weed species deleteriously affects aquatic systems.

Barlow Noxious Weed Control, Wasco County - \$72,000

The project treated existing infestations of noxious weeds in order to eradicate or slow the spread of target weeds on the Barlow Ranger District.

2006 Monitoring Report

Hazard Tree Removal, Wasco County - \$16,140

This project removed dead and dying trees along 15 miles of Forest roadways to improve safety and provide firewood for the public.

Pioneer History Camp, Wasco County - \$9,000

This project provided interpretive talks, conservation education, living history presentations, and created hands-on activities for the public during the Pioneer History Days/Oregon Archeology Celebration, which was held for ten days in September. Camp set up was at the White River Station Campground along the Barlow Road.

Sam Barlow's Youth Conservation Camp, Wasco County - \$22,500

This project provided funding for a nine-person Youth Conservation Camp non-residential crew based out of the Barlow Ranger Station.

Title II and Title III Project Coordinator, Wasco County - \$50,625

This project provided consistency and communication between the Barlow Ranger District and Wasco County, and coordination between the Forest Service and Corrections Crew supervisor for Title III project work on public lands.

Watershed Restoration Project Inventory, Wasco County - \$24,185

This project identified and evaluated for the feasibility of watershed restoration projects for watersheds that are entirely or at least partially on the Forest. It also identified each projects' goals and objectives.

Wasco County Precommercial Thinning, Wasco County - \$9,190

This project thinned precommercial stands on the Hood River and Barlow Districts to develop timber stands that are more productive, healthier and resilient to catastrophic wildfire.

Other Community Engagement

Partnerships/Volunteers

Volunteers and partnerships are an integral part of management of the Forest and are as varied as the work they accomplish.

Some partnerships simply help the Forest Service get the work done; while others are involved in major collaborative and stewardship roles becoming advocates helping to implement the 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. The volunteers may work as part of an organized group or may contribute 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.

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

Traditional Human Resource Programs, more aptly called *Senior, Youth and Volunteer Hosted Program* opportunities resulted in:

- 1,270 participants
- Accomplishing 13.5 person years of work

- Valued at over \$440,188 in FY 2006.

Two Forest Service operated **Youth Conservation Corps (YCC)** non-residential crews employed 17 eastside youth as a result of the Forest pooling resources with:

- **Hood River County Juvenile Department;**
- *Oregon Youth Conservation Corps;*
- **Trust Management Services;**
- **Wasco County Payment to Counties, Title I and III; and,**
- **Mid-Columbia Council of Governments.**

These partners contributed 100 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 Forest has been proud to make it a priority to provide opportunity for youth through a YCC program for all except six years since the passage of the YCC legislation in 1973.

An Americorp Volunteer served as the YCC crew leader for the summer through an agreement with Links Program/ESD 112.

2006 Monitoring Report

Hosted Programs are programs where the manpower, job training and development programs run by other organizations that the Forest Service “hosts” 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;***
- ***MacLaren Youth Correction Facility;***
- ***Multnomah County Department of Juvenile and Adult Community Corrections;***
- **Northwest Youth Corps;**
- **Reynolds School District, Multnomah Youth Cooperative;**
- **Wasco County Department of Youth Services;**
- **Student Conservation Association;** and
- **Americorp/Northwest Service Academy.**

As a result of these hosted programs, Forest roads and trails have been brushed, riparian fencing built, facilities maintained, fire breaks constructed, bridges built and invasive plants removed. A seven-person Northwest Service Academy trail crew was stationed at Zigzag for the summer. The crew provided invaluable assistance with trail maintenance, construction and improvements to the Cross Town Ski Trail surrounding the community of Government Camp. They constructed seven new bridges that are able to support heavy cross country trail grooming equipment all within a two week window.

Volunteers include both individuals and organized groups. Individual volunteers contributed their time and effort to positions, such as:

- Timberline Lodge Interpretative Specialists;
- Clackamas Lake Guard Station Visitor Information Specialist;
- Hickman Butte Fire Lookout;
- Winter Snow Trails Specialists; and,
- Wilderness Stewards.

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

- Fishing Clinics;
- Festival of the Forest;
- Geologic Surveys;
- Trail Maintenance Work Days;
- PIT (Passport in Time) Archeological Survey Projects; and
- Fish and Wildlife Surveys and Habitat Improvement Projects.

Sponsored groups provide a significant percentage of volunteer accomplishment. As the number of Forest employees continues to downsize, more emphasis is placed on organized volunteer groups and partners to take an active role in recruiting, training and supervising volunteer activities.

The 2006 Forest Partners and Volunteers Recognition Picnic hosted 90 volunteers and partners who had contributed their time or resources to Forest work. The Backcountry Horsemen were the gracious hosts for this celebration!

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 – Portland, Teacup and The Dalles Chapters;*
- *Pacific Crest Trail Association – Mount Hood Chapter;*
- **Portland United Mountain Pedalers (P.U.M.P.); and**
- **Discovery Bike Shop.**

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;* and
- *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 complete rebuilding of the Timberline Amphitheater was completed in the summer of 2006 through the efforts of the Friends of Timberline. **Friends of Clackamas Lake Guard Station** helped with the annual “Spring Cleaning” of the site as well as 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 trail system users covered the cost of the equipment rental.

Wilderness Stewardship

In 2001, Wilderness Co-Stewardship agreements emphasizing Leave No Trace education as well as monitoring and restoration were developed with several organizations including *Mazamas and Oregon Equestrian Trails*. As a result, 11 volunteer wilderness stewards, both equestrians and hikers, served as on-site stewards in wilderness sites with higher visitation. The stewards reached an estimated 1,500 wilderness visitors.

Portland Mountain Rescue members volunteered to help provide Leave No Trace education with an emphasis on preparedness to climbers on Mt. Hood's southside climbing route. Funding provided by the *Mazamas* allowed the Forest Service to increase patrol days on the southside climbing route from two days a week in the spring to four days a week. The goal of this increase patrol was to provide climbers with current information on climbing conditions (crevasse condition, snowpack, rockfall hazard) on both the Forest website (<http://www.fs.fed.us/r6/mthood/recreation/climbing/index.shtml>) and in the climbers' register at Timberline Lodge.

Citizen Stewardship Plan for Action

The Mt. Hood National Forest Community Engagement Action Team (CEAT) was created in 2002 to expand engagement of community and partners in sound resource management and stewardship of the Forest. Developments continue in the areas of internal capacity building, communication, partnership building, and honoring Forest partners and volunteers.

Conservation Education, Information and Outreach Activities

Forest partners, collaborators, and cooperators participate, through a variety of agreements, in delivering a wide array of informational, educational and outreach activities to thousands of Forest visitors all year long.

As a partner in *Fire Prevention Cooperatives* and local events, the Forest reached well over 13,200 people with key messages. Events ranged from the Pacific Northwest Sportsmen Show to county fairs, local festivals, and Earth Day events.

Teachers, scout leaders and others have borrowed traveling programs, slide shows, displays, educational games, and video tapes from the Environmental Education Resource Center, a library of educational programs and resource materials housed at the 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 Forest, *Wolfree, Inc* and the *Bureau of Land Management (BLM)* teamed up in 1993 to develop Cascade Streamwatch, a conservation education program which dovetails with school curriculum serving over 3,638 urban youth from 18 schools and six other organizations. It is estimated that another 10,000 visitors to Wildwood Park benefited from the environmental education facilities developed for Cascade Streamwatch as part of their use of Wildwood Park. In addition, natural resource professionals from the Forest assisted in teaching on-site field sessions in another Wolfree school program, Highland Ecology; an ecological exploration of forest organisms.

Salmon Watch, a partnership with **Oregon Trout** and several other regional partners and foundations provided 5,190 middle and high school students and 138 teachers, from 97 classrooms, with opportunities to study aquatic and riparian ecology and the relationship of humans in their environments. The program has been carried out successfully for 13 years, and has statewide. Oregon Trout and the Forest Service developed the original Salmon Watch curriculum and continue to update it and add to it on a regular basis. Oregon Trout personnel take the lead in coordinating with the schools; recruiting and training volunteers to assist in field trips, including 176 field trips in 2006. The Mt. Hood National Forest serves as the lead or coordinating Forest for programs on six National Forests in Oregon.

The Mt. Hood National Forest partnered with **Metro, Oregon Trout, Portland Water Bureau, Columbia River Intertribal Fishing Commission**, and **Portland General Electric** to host the Oxbow Salmon Festival, an annual event celebrating the return of the Fall Chinook Salmon to the Sandy River. The Forest Service sponsors the Children’s Activity Tent where local government and private organizations feature hands-on activities promoting wise-use and stewardship of natural resources, engage visitors in playing the “Salmon Life Cycle Game”, and present interactive exhibits on fisheries/aquatics and hydrology. The highlight and cornerstone activity is the Forest Service’s popular Salmon Tent, Frank and Francis fish mascots, and Smokey Bear. Attendance at the 2006 Festival was 5,500.

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 fishing”. 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. 385 children participated in fishing clinics in 2006. These events were held at various locations throughout the Forest in cooperation with **Oregon Department of Fish and Wildlife** and community partners including PGE, Trout Unlimited, Eagle Creek National Fish Hatchery, US Fish and Wildlife, Thousand Trails, Middle Fork Irrigation District, NW Fly fishers Club, **Oregon State Police**, and **Cascade Pacific Council of Boy Scouts** as well as *local merchants* who generously donate prizes.

The 4th Annual Festival of the Forest included a Forest Service organized conservation education component which emphasized forest wildlife. The Festival is a partnership between the **Welches Productions, Bureau of Land Management**, and Forest Service. The Festival was held at the BLM Wildwood Recreation Site, in Welches, and was attended by more than 1,600 visitors. The conservation education included a Passport booth, fisheries booth, fly fishing demonstration, bird box building, Cascadia Wild tracking and outdoor skills booth, and a Mt. Hood Arts Contest celebrating the beauty of the mountain and National Forest.

2006 Monitoring Report

Resource Assistants **Student Conservation Association** and Forest Service volunteers staffed the visitor information station and Interpretive Program at Timberline Lodge, a National Historic Site. Lodge tours, nature walks and the information counter operated seven days a week and served over 20,000 visitors from the local area as well as from around the country and world.

For the fifteenth year in a row Pioneer History Camp was held on the Barlow Trail. An 1840's pioneer camp was recreated to demonstrate a living history experience for over 500 school children, and 300 Forest visitors and history enthusiasts from all over the world. Volunteer interpreters dress in pioneer clothing, live in tents and cook their meals in Dutch ovens.

2006 Conservation Education

The Forest worked with many community partners, educators, organizations and public agencies to provide a variety of informational, educational and outreach materials and activities throughout the year to thousands of urban residents and Forest visitors. These activities include:

Forest Offices – Education Materials

- Northwest Interpretive Association conservation education sales materials
- Teacher's conservation education materials checkout program

On Forest – Education Projects

- Catlin Gable School Riparian Rangers

- Cloud Cap Inn Interpretive Program
- Mountain Bike Rangers Program
- National Fishing Week Junior Fishing Clinics
- Pioneer History Camp – Barlow Trail
- Salmon Watch
- Ski with the Ranger Program
- Timberline Lodge Interpretive Program
- Volunteers involved in Forest resource work
- Watchable Wildlife: Bonney Butte Hawk Watch Migration
- Watchable Wildlife: Washington Cascades Birding Trail
- Junior Ranger Program at Mt. Hood Ski Bowl

In Community – Education Events

- Cascade Streamwatch
- Festival of the Forest
- Hood River County Fair
- Junior Ranger Program in Parkdale
- Forest Heritage Day in Government Camp
- National Fishing Week Junior Fishing Clinics
- Numerous K-12 school programs
- Oregon Zoo's Urban Nature Overnight Program
- Oxbow Salmon Festival
- Pacific Northwest Sportsman Show
- Smokey Bear Day at Portland's PGE Baseball Park
- Firewise educational displays at nine local nurseries

- Clackamas County Fair
- Earth Day, Gresham
- Damascus Day in the Park

Monitoring

Long-term partners involved in monitoring activities include:

Northwest Ecological Research Institute who has partnered with the Forest since 1987 to recruit, train and supervise **Wetland Wildlife** volunteers who monitor wildlife activities at specific wetland sites across the Forest. There were 397 volunteer hours for the project utilizing 19 volunteers. Three of the volunteers were under 18 years of age and eight volunteers were over 55 years of age. The information they provide is valuable to establishing information of species occurrence and trends.

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. Due to its panoramic vantage point to view migrating hawks and eagles, the Bonney Butte raptor counting site attracts birdwatchers from around the world. In 2006, there were 419 visits Bonney Butte, including repeat visitors, which represents a significant decline compared to the last two years. The lower visitation likely is due to decreased media attention and inclement weather causing groups to cancel visits. **Hawkwatch International** wildlife interpreters provide raptor education to visiting birdwatchers and outdoor enthusiasts. Others supporting this partnership include:

- **Portland and Central Audubon Societies;**
- **Oregon Department of Fish and Wildlife;**
- **U.S. Fish and Wildlife Service;**
- **Neotropical Migratory Bird Conservation Act Grant Program**
- **Oregon Parks Foundation**
- **Fledgling Fund**
- **HWI private donors and members**

There were 11 species of raptors recorded at Bonney Butte in 2006 with 491 individual birds being recorded. The most common hawks recorded were sharp-shinned and red-tailed hawks, respectively. The least common were peregrine falcon and rough-legged hawks with only one bird each being documented this year. A full report of the results of the monitoring can be found at: http://www.hawkwatch.org/home/index.php?option=com_context&task=view&id=43&Itemid=45

The **Oregon Archeological Society** (OAS) has been an ongoing partner in archaeological site monitoring and evaluation projects. In 2006, OAS participated in the evaluation of an historic-period logging camp near Rock Creek Reservoir, Barlow Ranger District, assisting the Heritage Program in evaluating the effects of proposed property conveyance. OAS volunteers assisted in test excavations and site mapping. Throughout the year, other OAS volunteers continued periodic monitoring inspections of select archaeological sites within the National Forest.

Appendix A
List of Preparers

Appendix A

List of Preparers

Arredondo, Christine – *Community Engagement*

Cartwright, Linda – *Noxious Weeds*

DeRoo, Tom – *Geology and Minerals*

Dodd, John – *Soils*

Dyck, Alan – *Wildlife/Plants*

Fissell, Dan – *Range*

Geiser, Linda – *Air Quality*

Godek, Chris – *Financial*

Hakanson, Shelley – *Partnerships/Volunteers*

Hamilton, Malcolm – *Recreation*

Hickman, Tracii – *Fisheries*

Lankford, Nancy – *Silviculture*

Lombardo, Michelle – *Planning*

Martinez, Juan – *Human Resources*

McClure, Rick – *Heritage Resources*

O'Connor, Jennie – *Planning*

Rice, Jeanne – *Ecology*

Rice, Jim – *Timber*

Steinblums, Ivars – *Water Resources*

Tierney, Jim – *Transportation/Roads*

Wrightson, Jim – *Fire*

York, Shelly – *Desktop Publishing*

Appendix B
Draft Criteria and Indicators

Appendix B

Draft Criteria and Indicators

The following draft criteria and indicators, developed during the LUCID test, provide a first approximation relevant to describing sustainability for the Mt Hood National Forest and will be further refined and adapted through the collaborative process.

Principle 1 - Social Well-Being

Collaborative Stewardship

- Citizen Involvement (volunteerism, cooperative agreements, collaboration, political engagement)
- Local area empowerment (Forest Service community capacity building, education)
- Collaborative decision making (Involvement in decision making process)
- Civic science (expertise, process)

Community Resilience

- Civic competence at the community level (knowledge, skills and abilities about resources)
- Civic enterprise (collective action experience)
- Social capital – Built relationships (number of civic/mediating organizations, environmentally focused non-profits, local services)

Institutional Adequacy

- Rules of the game (structure of government)
- Tenure (public and private land ownership)
- Legal framework (laws)
- Authority structure (land use agreements, stewardship certification)

Social and Cultural Values

- Sense of place
- Aesthetic values (scenic integrity)
- Recreational values (risk and safety, impacts & conflicts)
- Access
- Cultural heritage
- Civil rights
- Environmental justice organization
- Worker safety

Community Livability

- Community health (employment, crime, education, services, spousal abuse)
- Settlement pattern (complexity of land use, migration, demographics)

Principle 2 – Ecological Integrity

The ecological criteria and indicators were based on maintaining integrity of ecological systems to provide sustainable forests.

Landscape Function – processes that influence landscape patterns and distribution

- Disturbance processes (fire risk, insect and disease risk)
- Hydrologic function (watershed condition class, hillslope processes)
- Long-term Community Dynamics (longevity of current plant community assemblages)

Landscape Structure/Composition – landscape structures/composition that influence pattern

- Landscape diversity (vegetation composition – seral stage)
- Landscape patterns (habitat distribution, human developed landscape features)

Ecosystem Function - ecosystems are defined by fluxes in energy and matter

- Productive capacity (site productivity, tree growth, animal production)
- Functional diversity (species at risk or extirpated)
- Invasive species (plants and fish)
- Nutrient cycling (soil organic matter)
- Carbon sequestration (soil carbon and carbon sinks)
- Stream function (riparian vegetation, stream condition, community health)

Ecosystem Structure - ecosystems are defined by fluxes in energy and matter

- Air, soil and water quality (municipal water supply, air quality index)
- Ecological legacies (snags and coarse woody debris levels)
- Special habitats (wetlands)
- Species richness (native species diversity)

Population Function – defined by processes such as competition, predation, and mutualism that define interaction between organisms in the assemblage

- Species of concern (population viability of plants, animal and aquatic species)

Population Structure - plant and animal communities are defined by the occurrence of, density and age structure of indigenous species especially threatened, endangered and sensitive species

- Population of indigenous species (listed species)

Genetic Function - processes that shape population and genetic variation

- Artificial selection (harvest prescriptions)
- Migration (genetically selected stock, offsite stock)
- Drift (census population estimates)

Principle 3 – Economic Well-Being

The economic criteria and indicators were based on two fundamental principles of sustainable development:

1. Maintain sufficient natural, built, and human/social capital through time to provide non-declining flows of the goods and services desired by society from the Forest; and,
2. Distribute the goods and services in ways that ‘equitable’ access and benefit are achieved for all major stakeholders, and for future generations.

Sustain minimum stocks of natural, human and built capital

- Natural capital (land, timber, water, wildlife that contribute to ecosystem functioning and/or human welfare)
- Human capital (private forest workforce and public agency workers)
- Built capital (facilities, roads, trails contributing to providing goods and services)

Produce and consume sustainable (annual) flows of market goods and services

- Commercial products from the forests and lands, (forest products, minerals)
- Energy flows (kilowatts generated)
- Developed recreation (recreation fees – ski passes, camping)

Produce and consume sustainable flows of non-market goods and services

- Undeveloped active recreation (recreation for which access is not regulated directly by fees – hiking)
- Passive tourism and scenic amenities (scenic viewing by touring)
- Water flows and quality (municipal water supplies, instream flows)
- Air quality effects (carbon sequestration, smoke, pollution)

Ensure an equitable distribution of benefits and costs

- Marketed forest goods and services
- Non-marketed goods and services
- Demographics of workforce
- Local revenue sharing (government payments to local jurisdictions related to forest operations)
- Rent distribution by recipient (timber, recreation, range)

Maintain an appropriate regional economic trade balance

- Exports of goods and services
- Imports of goods and services (meeting sustainable flows of desired services)
- Ability for local community to meet labor requirements (capacity to delivering sustainable flows of goods and services from forest resources)

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