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Region

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Land and Resource Management Plan

Olympic National Forest



LAND AND RESOURCE MANAGEMENT PLAN

for the

OLYMPIC NATIONAL FOREST PACIFIC NORTHWEST REGION

PREFACE

Preparation of a Land and Resource Management Plan (Forest Plan) for the Olympic National Forest is required by the Forest and Rangeland Renewable Resources Planning Act (RPA) as amended by the National Forest Management Act (NFMA). Regulations developed under the RPA establish a process for developing, adopting, and revising land and resource Plans for the National Forest System (36 CFR 219). The Plan has also been developed in accordance with regulations (40 CFR 1500) for implementing the National Environmental Policy Act of 1969 (NEPA). Because this Plan is considered a major Federal action significantly affecting the quality of the human environment, a detailed statement (environmental impact statement) has been prepared as required by NEPA. The Forest Plan represents the implementation of the Preferred Alternative as identified in the Final Environmental Impact Statement (FEIS) for the Forest Plan.

If any particular provision of this Forest Plan, or application of the action to any person or circumstances is found to be invalid, the remainder of this Forest Plan and the application of that provision to other persons or circumstances shall not be affected.

Information concerning this plan can be obtained from:

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OLYMPIC NATIONAL FOREST LAND AND RESOURCE MANAGEMENT PLAN

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ABBREVIATIONS AND ACRONYMS

GLOSSARY

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Chapter I

Introduction to the Forest Plan



Olympic National Forest

Chapter I

INTRODUCTION TO THE FOREST PLAN

PURPOSE OF THE FOREST PLAN

The Forest Plan guides all natural resource management activities and establishes management Standards and Guidelines for the Olympic National Forest. It describes resource management practices, levels of resource production and management, and the availability and suitability of lands for resource management.

The Forest Plan:

1. Establishes Forest-wide multiple-use goals and objectives;
2. Establishes Forest-wide standards and guidelines applying to future activities;
3. Establishes management area direction, including management area prescriptions and standards and guidelines applying to future management activities within management areas;
4. Establishes the allowable sale quantity for timber and identifies land suitable for timber management;
5. Establishes monitoring and evaluation requirements.

The Forest Plan embodies the provisions of the National Forest Management Act of 1976 and its implementing regulations, as well as other guiding documents. Land use determinations, prescriptions, and standards and guidelines are statements of the Plan's management direction; however, the projected outputs, services, and rates of implementation are estimates and are dependent on the annual budgeting process.

The Forest Plan incorporates the Pacific Northwest Region's FEIS for Managing Competing and Unwanted Vegetation. In implementing the Plan through project activities, the Forest will comply with the Record of Decision issued by the Regional Forester dated December 8, 1988, and the Mediated Agreement of May, 1989. Use of all vegetation management techniques is allowed only when other methods are ineffective or will unreasonably increase project costs. Emphasis must be on prevention and early treatment of unwanted vegetation, and on full public involvement in all aspects of project planning and implementation. Information about the vegetation management FEIS, ROD, and Mediated Agreement are available at the Forest Supervisor's Office.

This Plan will ordinarily be revised on a 10-year cycle, with a maximum of 15 years between Plan revisions.

PLAN STRUCTURE AND ORGANIZATION

The Forest Plan document is composed of five chapters, a glossary, and appendices.

Chapter I introduces the reader to the purpose of the Plan, describes what it contains, discusses the Plan's relationship to other documents, and describes the Olympic National Forest's geographic location and general characteristics.

Chapter II is a summary of the Analysis of the Management Situation. Included are summaries of the current management situation for important issue-related resources, potential supply estimates for various resource goods and services, and a brief look at demand projections. Also included in Chapter II is a listing of research and inventory needs identified during the planning process.

Chapter III summarizes the public issues, management concerns, and resource management opportunities identified through the planning process and described in the Environmental Impact Statement. This chapter briefly explains how each is responded to by the land allocation and direction in the Forest Plan.

Chapter IV is the heart of the Plan, and contains the multiple-use resource goals which the Forest has established for the planning period. Accompanying this are the projected resource outputs, some of the management activities, and the budget necessary to achieve the stated goals. The outputs and activities are estimates of what will be produced, or what will occur, with full implementation of the Plan. The output objectives are followed by resource narratives that provide insights into how the major resource components will be managed.

Chapter IV also contains standards and guidelines for Plan implementation. They apply to everyday on-the-ground projects and cover a wide range of resources. Some are specific and others provide general direction to follow. This chapter also contains management area descriptions. Prescriptions for the management areas define types of activities that can occur within an area. The locations of the various management areas within the Olympic National Forest are shown on the map for Alternative C-Preferred (Modified), the preferred alternative, included in the FEIS.

Chapter V contains direction for implementing the Plan, the monitoring and evaluation program, and procedures that will be followed should amendments or revisions to the Plan be necessary. As the Forest Plan is implemented, it will be monitored to determine if the output projections and standards and guidelines in Chapter IV are being met, whether the standards and guidelines are adequate to achieve management goals and, if not, what needs to be changed to achieve the stated goals. Results of this monitoring will be used to evaluate whether estimates and assumptions made during the planning process are appropriate, and whether amendment to or revision of the Plan is warranted.

The Glossary defines terms used in this document that are not normally found in a dictionary, or are used in a context differently than is usually recognized.

The appendices include detailed schedules of projected activities by resource, background information regarding development of the monitoring plan, and a discussion of Best Management Practices (BMPs).

RELATIONSHIP OF THE FOREST PLAN TO OTHER DOCUMENTS

RELATIONSHIP TO THE ENVIRONMENTAL IMPACT STATEMENT AND RECORD OF DECISION

This Forest Plan sets forth the preferred alternative for managing the resources of the Olympic National Forest. The Plan results from extensive analysis and considerations that are addressed in the accompanying Environmental Impact Statement (EIS) and Record of Decision (ROD). The EIS also describes the range of alternatives considered in the planning process. For purposes of complying with the National Environmental Policy Act (NEPA), this Plan and the FEIS are treated as combined documents.

Activities and projects will be planned and implemented to carry out the direction in this Plan. The management direction is presented in Chapter IV of this document, and the activities and projects are included in the various appendices. The Forest will perform environmental analyses on these projects and activities. The project-level environmental analysis will use the data and evaluations in the Plan and final EIS as its basis. Documentation of the project-level analysis will be tiered to the FEIS accompanying this Plan.

RELATIONSHIP TO THE REGIONAL GUIDE

The Regional Guide for the Pacific Northwest Region of the Forest Service, as amended December 8, 1988, provides direction for National Forest Plans. Standards and guidelines addressing major public issues and management concerns were considered at the Regional level to facilitate forest planning. Direction in the Regional Guide, including standards and guidelines, is incorporated into this Plan.

RELATIONSHIP TO THE PACIFIC NORTHWEST REGION FEIS FOR MANAGING COMPETING AND UNWANTED VEGETATION

This Plan incorporates the Pacific Northwest Region's FEIS for Managing Competing and Unwanted Vegetation. In implementing the Forest Plan through project activities, the Forest will comply with the Record of Decision issued by the Regional Forester dated December 8, 1988, and the Mediated Agreement of May 1989. Use of all vegetation management techniques is allowed only when other methods are ineffective or will unreasonably increase project costs. Emphasis must be on prevention and early treatment of unwanted vegetation, and on full public involvement in all aspects of project planning and implementation.

RELATIONSHIP TO PROJECT PLANNING

The Forest Plan serves as the single land management plan for the Olympic National Forest. All other land management plans are replaced by direction in this Forest Plan. See Chapter V for a listing of plans superseded by this Forest Plan. Resource management objectives are presented in Chapter IV, and schedules of resource management practices for each management area are displayed in Appendix A.

Implementation and action plans designed to give further guidance for management and development activities are revised or developed "under the umbrella" of this Forest Plan. Some existing implementation plans may be consistent with the Forest Plan and may be maintained in their current form. These, in effect,

FOREST DESCRIPTION

become part of the management direction and implementation package for the Forest. For a listing of these implementation plans or studies, see Chapter V.

The management direction provided by the Forest Plan comprises the framework within which project planning and activities take place. It defines management area goals and management standards that guide project activities toward achieving the desired future condition for the management area and, collectively, for Olympic National Forest. It also specifies a schedule for project activities and management practices, and provides guidance concerning potential projects and project limitations, including assumptions about the appropriate vegetation management practices for timber sale projects. On-the-ground project analyses verify the appropriateness of those assumptions.

Within this guidance, projects are developed to most efficiently and effectively accomplish management goals and objectives. All NEPA requirements will be complied with for all projects.

Project environmental analyses provide an essential source of information for Forest Plan monitoring. First, as project analyses are completed, new or emerging public issues or management concerns may be identified. Second, the management direction designed to achieve management area goals is validated. Third, the site-specific data collected for project environmental analyses serve as a check on the appropriateness of the land allocation. The information included in project environmental analyses is used in the monitoring process to determine if and when changes should be made to the Forest Plan.

FOREST DESCRIPTION

THE PENINSULA

The Forest is located on the Olympic Peninsula in the northwest portion of Washington State. The Peninsula is a separate and unique geographical area surrounded on three sides by saltwater. U.S. Highway 101 is the main travel route, paralleling the Pacific Coast on the west, Strait of Juan de Fuca on the north, and Hood Canal and the inland waters of Puget Sound on the east. This 6,500 square mile area is an association of complex winding ridges, rugged and steep mountains, deep canyons, and tree-covered slopes. Because of the extremely rugged topography, there are no through routes crossing the center of the Peninsula. Refer to Figure I-1 for a general vicinity map.

The first people who lived on the Olympic Peninsula were American Indians whose ancestors are believed to have migrated from Asia by way of Alaska. No one knows how long these American Indians were present before European settlers arrived. Archaeological work now being conducted indicates they had lived here for many centuries.

Explorers made contact with the coastal region more than three centuries before the interior was investigated. The Press Expedition explored the mountainous core in the 1890's. After early explorations, the inland Peninsula saw little development. Almost all settlement on the Olympic Peninsula is along saltwater. A major portion of the Peninsula's population is in the towns of Aberdeen, Hoquiam, Forks, Port Angeles, Sequim, Port Townsend, and Shelton.

An incredible variety of environments occurs within short distances on the Peninsula. Within the less than fifty miles between the Pacific Ocean and Mt. Olympus, the vegetation changes from the lush, temperate rain forests of the Hoh, Queets, and Quinault River valleys to an arctic environment of lichens and mosses. More than one hundred species of wild flowers have been identified on the National Forest alone; eight

native only to the Olympic Mountains occur in the Arctic-alpine zone. The major commercial wood-producing trees are Douglas-fir, western hemlock, western redcedar, and Pacific silver fir.

Precipitation is heavy in the fall and winter, reaching a peak in December and decreasing in spring. The driest area is the northeastern corner, which receives less than 25 inches of precipitation a year. The wettest areas, with more than 220 inches annually, are on the windward side of Mount Olympus and in the upper Clearwater River drainage. Winter snowfall ranges from less than 10 inches in the lower valleys to more than 250 inches in the higher mountains. Summers are relatively dry and mild, with the warmest temperatures averaging near 75 degrees F. Winters are wet and mild, with temperatures in the lowlands seldom dropping below 20 degrees F.

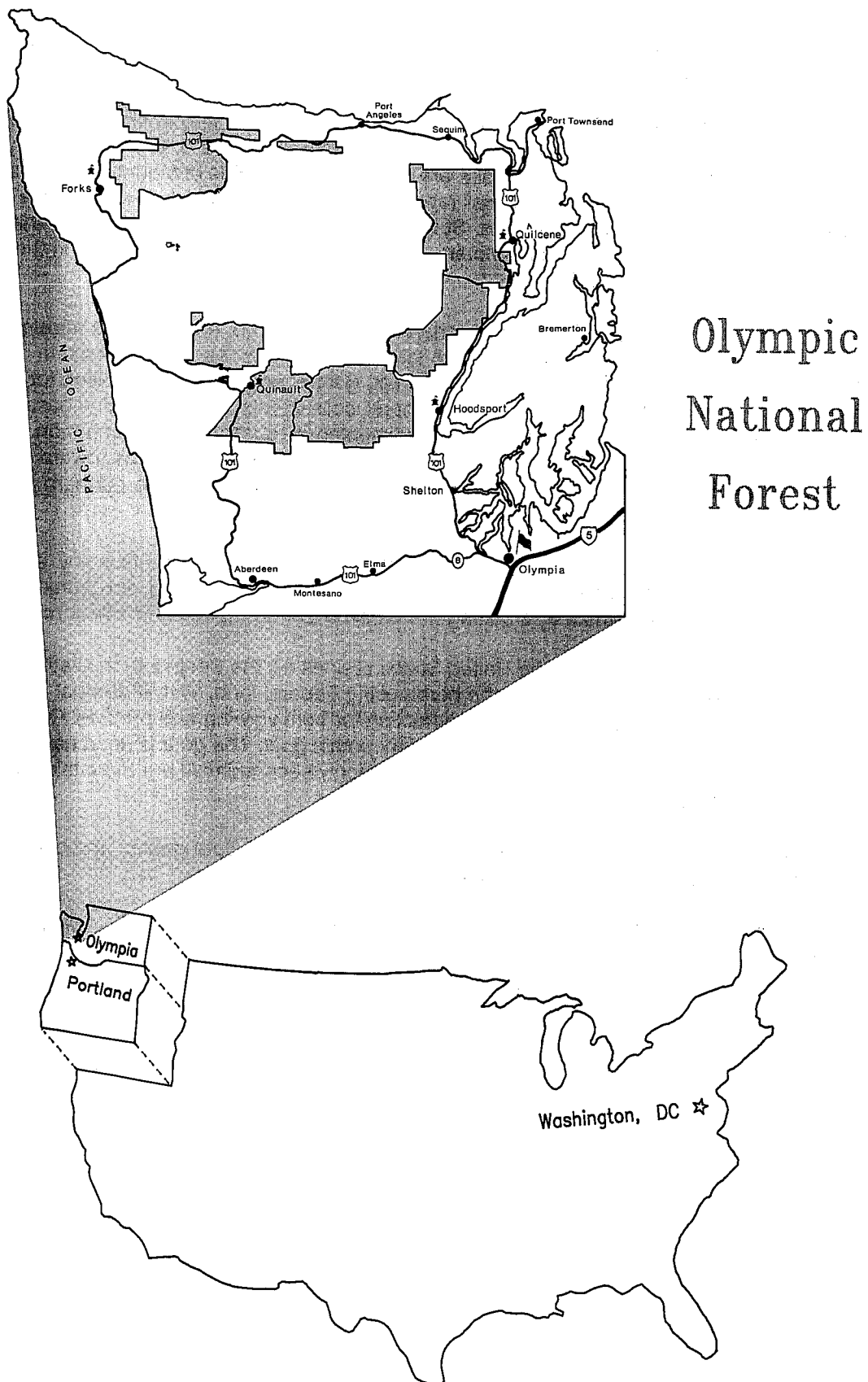
The Peninsula is generally thought of as an area characterized by steep, mountainous terrain dissected by large rivers that radiate from the center. Although this is an accurate description for much of the area, the south and west sides also have extensive areas of flat, gentle topography with rolling foothills. Soils have formed from a variety of geologic materials. In general, soils developed from marine basalt predominate in the south and east, while those derived from sedimentary deposits are most common in the north and west. Metamorphosed sediments and volcanics are found at higher elevations toward the interior. Soils derived from continental glacial drift are located at lower elevations along the northern and eastern flanks of the Olympic Mountains.

Many recreational opportunities exist throughout the year. Visitors and residents enjoy auto touring, camping, picnicking and backpacking, which are most popular during spring and summer. Fishing, hunting, berry picking, and Christmas tree cutting are enjoyed during the fall and winter months.

The largest Roosevelt elk population in the United States resides on the Peninsula. It is estimated there are between five and seven thousand elk in the herds using Federal land. With individual animals often weighing more than 600 pounds, elk are a major attraction for both viewing and hunting. Other common animals are black-tailed deer, black bear, marmot, and mountain goat. The goat is not a native Peninsula species, having been introduced in the 1920's. Less commonly seen animals are mountain lion, bobcat, coyote, beaver, marten, otter, mink, raccoon, and skunk.

There are over 250 species of birds common to the Olympic Peninsula. Both golden and bald eagles are frequently sighted, although few nests have been located.

The many lakes, rivers, and streams, as well as the surrounding bodies of saltwater, offer outstanding fisheries. Anadromous fish include steelhead trout, Pacific salmon, and sea-run cutthroat trout. Resident fish include cutthroat, eastern brook, and rainbow trout, as well as Dolly Varden char.



THE FOREST

The Olympic National Forest was designated a Forest Reserve in February 1897. President Cleveland signed the proclamation, which included 1,500,000 acres of public land on the Olympic Peninsula. On three separate occasions between 1897 and 1909, proclamations added or subtracted land from the Reserve. In 1905, the name Olympic Forest Reserve was changed to Olympic National Forest. The core of the Olympic National Forest was proclaimed Mount Olympus National Monument by President Theodore Roosevelt in 1909. The Monument was transferred from the jurisdiction of the Forest Service, Department of Agriculture, to the Park Service, Department of Interior in 1933, and became Olympic National Park in 1938. Since 1909, there have been several land transfers between the Forest and the Park.

Lands administered by the Olympic National Forest now occupy approximately 632,300 acres in Clallam, Jefferson, Grays Harbor, and Mason Counties. There are approximately 67,200 acres of private land and land administered by other government agencies within the boundary of the Forest, mostly on the west side.

National Forest lands are administered under the direction of a Forest Supervisor headquartered in Olympia, Washington. The Supervisor is supported by a headquarters staff, and by personnel on Ranger Districts located in Hoodport, Quilcene, and Forks, and on the south shore of Quinault Lake. See Figure I-2.

Principal forest resources include the vegetation (especially the trees), water, wildlife, fish, recreation, and Wilderness.

There are also about 250,000 acres of land owned by Simpson Timber Company directly affected by this Plan. Simpson's land, and approximately 111,300 acres of National Forest land in the Hood Canal Ranger District, are managed as the Shelton Cooperative Sustained Yield Unit (Shelton CSYU).

OTHER LANDS

Other major landownerships on the Olympic Peninsula that have a bearing on the environment and the Forest include Olympic National Park, the State of Washington Department of Natural Resources (DNR), several Indian Reservations, and private land (much of which is managed by large timber companies). Refer to Figure I-3 for an idea of the relationship of major ownerships.

Olympic National Park is the largest land manager, with 916,136 acres in the center of the Peninsula and in a narrow strip along the Pacific Ocean. Most of the major rivers originate within the Park. No roads go through the Park, although there are several within the boundary. In November, 1988 Congress created the 876,669 acre Olympic Wilderness within the Park. Within this Wilderness, recreation opportunities are limited to those associated with the Primitive end of the Recreation Opportunity Spectrum, such as hiking, backpacking, fishing, horseback riding, and mountain climbing. Approximately 701,000 acres of this Wilderness provide Primitive recreation opportunities, and the remaining 173,000 acres provide Semi-Primitive Non-Motorized recreation opportunities. A total of 39,467 acres of the Park are outside Wilderness, and provide opportunities that are common to the Roaded end of the Spectrum, such as auto camping, picnicking, boating, hiking nature trails, staying and eating at lodges, and viewing nature exhibits at visitor centers. Olympic National Park recreation facilities consist of 600 miles of trail (mostly in Wilderness), 19 campgrounds, 9 picnic sites, 6 boating sites, 7 visitor centers or museums, and 4 lodges or resorts.

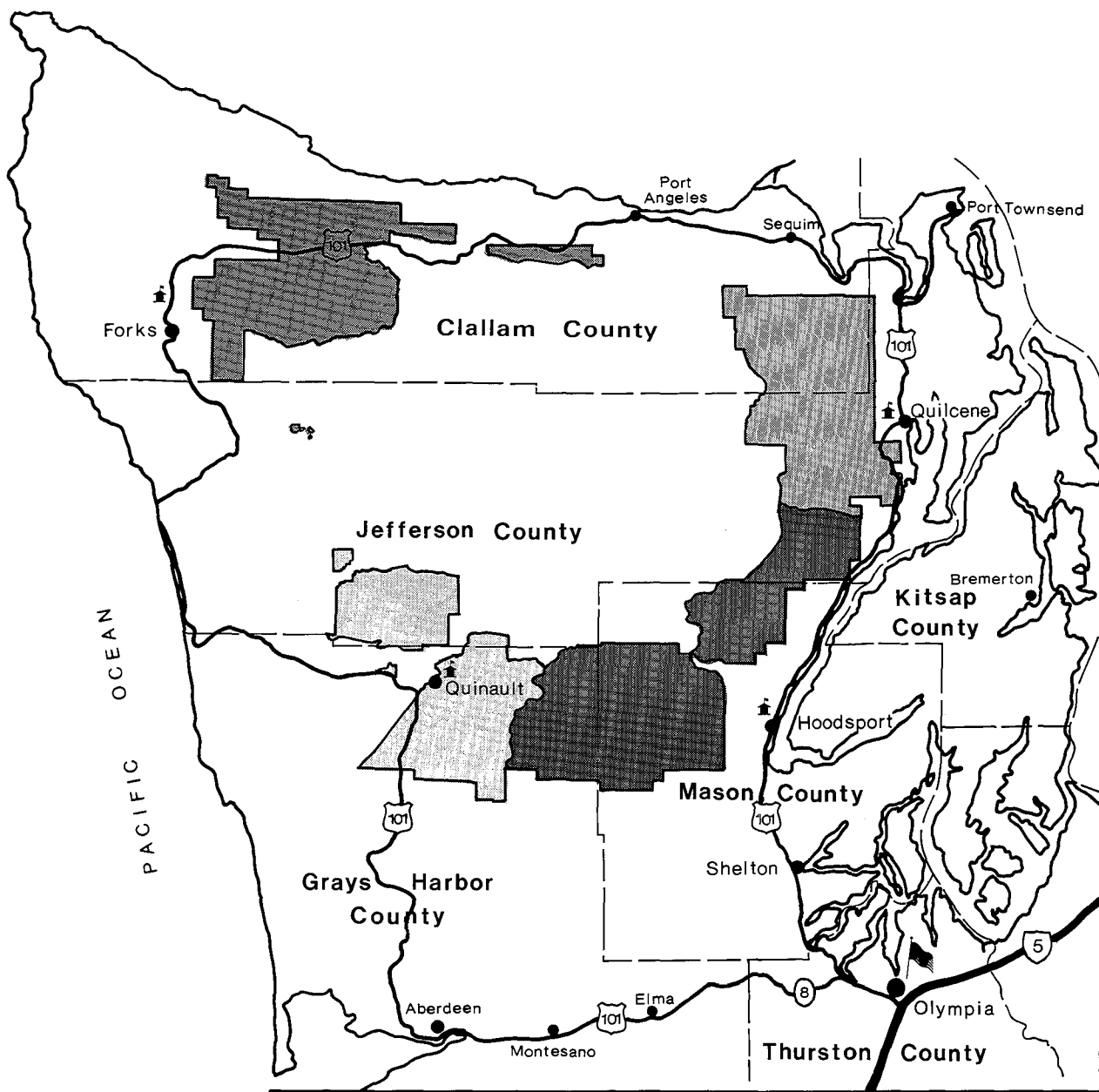
FOREST DESCRIPTION

The State of Washington DNR manages over 364,700 acres, mostly on the west side of the Peninsula. Timber production is the primary use, and current plans call for extensive harvesting of overmature forest stands. Recreation opportunities provided by the DNR are primarily at the Roaded end of the Spectrum. They include 9 campgrounds, 2 picnic sites, and 17 boating sites. Washington State Parks provide opportunities primarily for developed recreation. There are a total of 18 State Parks on the Olympic Peninsula, which provide a combination of experiences including camping, picnicking, and boating.

The various Indian Reservations include over 236,000 acres, with the Quinault, Makah, and Skokomish Reservations being the largest. The major activity has been timber harvesting, but management emphasis is changing as the acreage of overmature forest declines and more of the management and planning responsibility is assumed by tribal agencies. Newer management plans call for less emphasis on the timber resource and more emphasis on traditional values. Special consideration is being given to multiple-use management, especially for fish and wildlife, in association with the timber commodity.

Various forest industry corporations manage approximately 915,000 acres (excluding Simpson's Shelton CSYU land) in the four-county Peninsula area. Again, the predominant use is for timber production. Past activities have converted the area to young forests. Expectations are that these lands will continue to be managed primarily for the production of timber commodities.

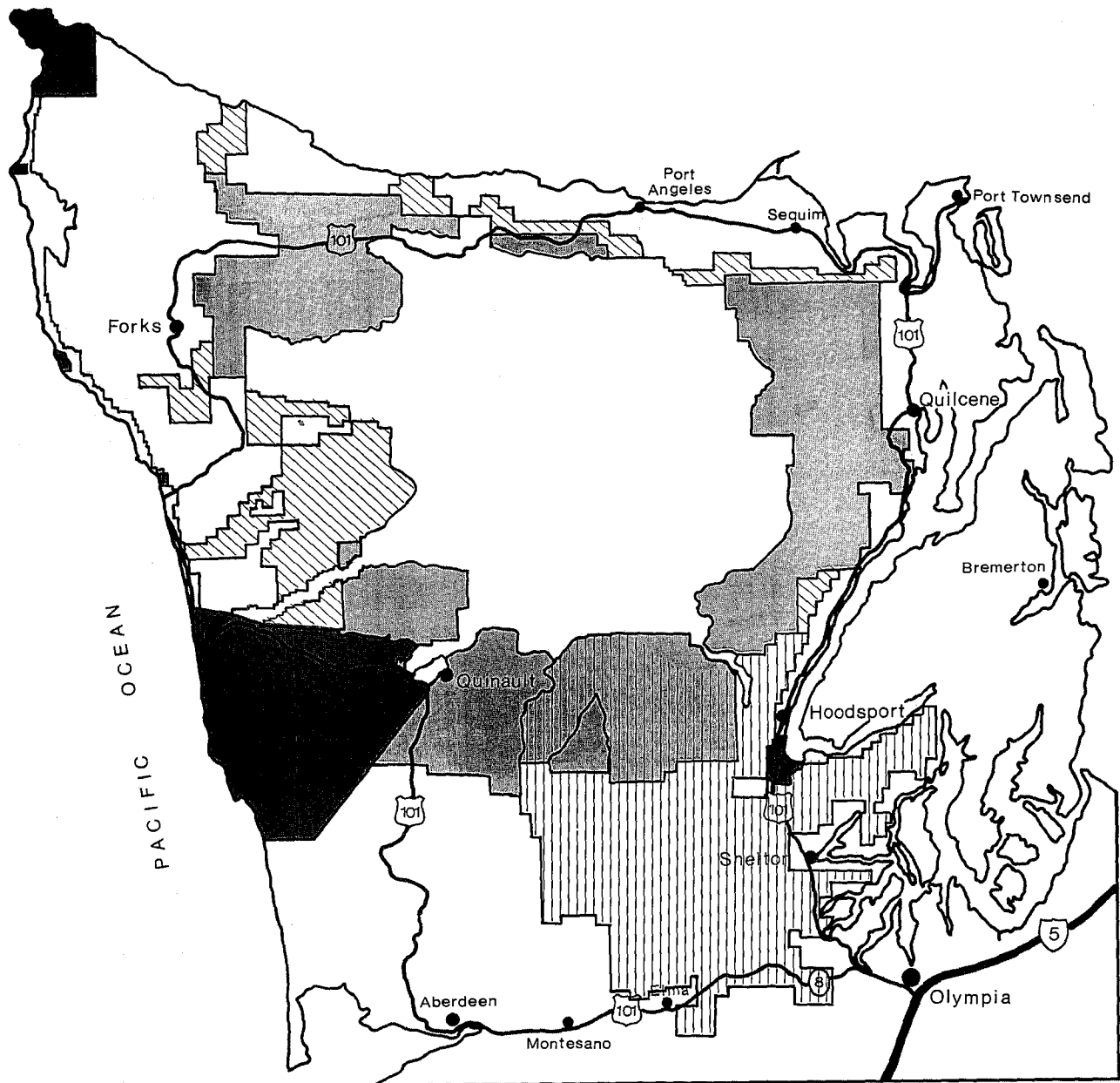
There are also numerous landowners with smaller acreage within and adjacent to the Forest boundary. The trend over the last decade has been toward more subdivision of these, with the subsequent construction of residences or other facilities reducing the acreage being managed for forest products. This is particularly true on the east side of the Forest. There are also several private recreation developments, primarily along State Highway 101. These provide a few additional facilities for developed camping, picnicking, and boating.



LEGEND

- | | | | |
|--|----------------------------|--|------------------------|
| | Hood Canal Ranger District | | Ranger Station |
| | Quilcene Ranger District | | Supervisor's Office |
| | Quinault Ranger District | | County Line Boundaries |
| | Soleduck Ranger District | | |

Figure I-2. RANGER DISTRICTS



LEGEND







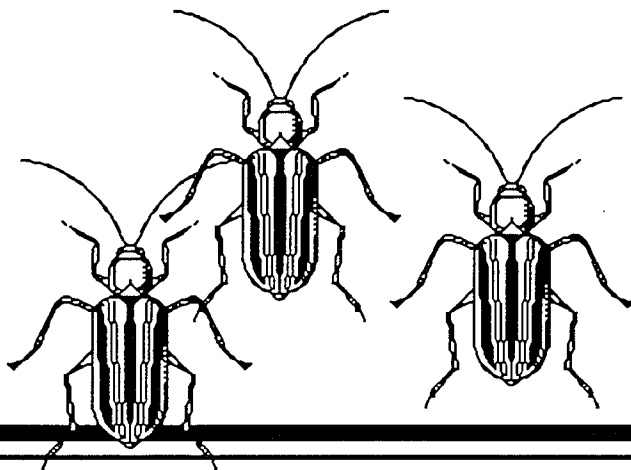
	Olympic National Forest		State of Washington
	Shelton CSYU		Indian Reservation
	Olympic National Park		Private Ownership

Figure I-3. LANDOWNERSHIPS

Chapter II

Summary of the Analysis of the Management Situation



Olympic National Forest

Chapter II

SUMMARY OF THE ANALYSIS OF THE MANAGEMENT SITUATION

INTRODUCTION

The purpose of this chapter is to briefly describe the Forest's Analysis of the Management Situation (AMS). This step of the planning process, conducted prior to the development of alternatives, was designed to identify key relationships between current management of the Forest, the desires of the public, and the production possibilities available to Forest managers. The AMS was structured to accomplish four principal goals, as follows:

1. Develop projections of demand for outputs related to public issues and management concerns.
2. Estimate the output levels that would be associated with continuation of current management direction into the future.
3. Estimate the maximum potential ability of the Forest to supply goods and services related to issues and concerns.
4. Integrate the results of the above steps into a definition of the Forest's range of opportunities to resolve issues and concerns. This integration of potential supply possibilities with estimates of future demand, when considered in light of the expected consequences of continuing current management direction, served as the basis for the development of land management alternatives.

Demand projections were developed for issue-related outputs on the basis of available information regarding present and anticipated future needs, desires, and (where appropriate) market conditions. Detailed information regarding the individual outputs discussed in this chapter, including the estimation of future demand, may be found in Chapter III of the accompanying FEIS. The expected outputs associated with continuation of current management direction were derived from analysis of Alternative A-Current Direction (No Action), as described in the FEIS.

Estimates of potential supply were generated through the analysis of numerous resource maximization benchmarks, each designed to identify the Forest's maximum potential to produce a specific issue-related output. These benchmarks were developed to include basic requirements for managing the Forest, such as the set of Management Requirements associated with land management alternatives, and are fully described in Appendix B of the FEIS. Further information regarding the AMS can also be found in the Olympic National Forest "Analysis of the Management Situation." Although it is now out of print, copies may be reviewed at the Olympic National Forest office in Olympia.

The individual discussions which follow cover, output by output, the demand projections, estimates of potential supply, and current direction output levels associated with key issue-related resources analyzed in the AMS. Supply, demand, and output data associated with these resources are also summarized in Table II-11. The concluding section of this chapter, "Information Needs," lists several research and inventory items that have been identified in the course of the planning process as information that will be useful or necessary in monitoring implementation of this Forest Plan and/or developing revisions to this Plan.

KEY ISSUE-RELATED OUTPUTS

SCENERY

The Olympic National Forest is seen from many key recreation roads on the Olympic Peninsula. U.S. Highway 101, several State, county, and Olympic National Park roads, and most Forest roads provide views of National Forest lands. Many of these roads have high visitor sensitivity. There are also several high-use recreation areas and sites that involve scenic backdrops. These include popular recreation areas, such as Quinault Lake, Lake Cushman, Hood Canal, and Lake Crescent, as well as the metropolitan areas of Puget Sound (Olympia, Tacoma, Seattle, Everett, Bremerton) and the local communities of the Olympic Peninsula.

Much of the Forest has experienced intensive timber management during the past 30 years. Roads and clearcut patches are evident in all major drainages. As a whole, the Forest today provides a wide range of vegetative diversity. Forest stands ranging from large old-growth to recently harvested and planted areas are present throughout.

The scenic resource has been inventoried in order to develop Visual Quality Objectives (VQOs). The VQOs specify, in relative degrees, levels of deviation from a natural-appearing landscape which are acceptable. The categories of scenic quality are defined as follows:

Preservation. Generally only ecological changes are evident.

Retention. Management activities are not evident to the casual Forest visitor.

Partial Retention. Management activities may be evident, but must remain subordinate to the characteristic landscape.

Modification. Management activities may dominate the landscape, but they follow naturally established form, line, color, and texture.

Maximum Modification. Management activities may dominate the landscape, but they should appear as natural occurrences when viewed in the background.

Current Management

Currently, there are two areas on the Forest for which the inventoried VQOs must be met when designing and implementing management activities. These are: (1) the east face of Quilcene Ridge (Green Mountain) as viewed from U.S. Highway 101 and Puget Sound, and (2) the west and north faces of South Quinault Ridge as viewed from Quinault Lake, Olympic National Park, and U.S. Highway 101. In addition, there are two existing land allocations having the primary objective of maintaining scenic quality: the "no harvest"

allocation in the Mt. Ellinor-Mt. Washington area, and the streamside management allocations within the Wynoochee, Skokomish, and Satsop River drainages. There are also five Wildernesses (88,265 acres) and one Research Natural Area (1,468 acres), all of which have the Preservation VQO.

Attainment of the Preservation VQO within Wildernesses and the Research Natural Area is specified in all alternatives. Modification and Maximum Modification VQOs can be met without significant effect on customary management practices. Therefore, the primary concern with respect to scenic quality is the management to be applied to land having inventoried VQOs of Retention or Partial Retention. Changes in normal timber harvest practices and other management activities are necessary on such land if VQOs are to be met. It is the degree to which these areas are managed to meet VQOs that forms the key element in assessing scenic quality.

The Forest currently has 18 Sensitivity Level 1 viewsheds, which indicate that a high level of scenic protection is needed, and two Sensitivity Level 2 viewsheds, which indicate a moderate level of scenic protection. Approximately 90,000 acres of the Forest are within these 20 viewsheds (refer to FEIS Chapter III, "Scenery"). The Visual Quality Objectives currently inventoried within these viewsheds are as follows:

Retention (R)	22,600 acres
Partial Retention (PR)	67,500 acres

Continued implementation of current direction will result in a substantial decline in the scenic quality of the Forest. Of the 90,100 acres having VQOs of Retention or Partial Retention, approximately 80,000 currently meet the inventoried objective. If current management is continued, this number is expected to drop to approximately 24,400 acres by 2030, with much of the decline occurring in the early decades. The reason for this projected decline lies in the nature of current management direction. With the exception of areas in which attainment of VQOs is required, current direction specifies that VQOs be considered in the design of management activities, but not necessarily met.

Demand

Demand for acreage meeting VQOs is assumed to remain constant through time. There currently exists demand to meet the inventoried Visual Quality Objectives everywhere on the Forest. Therefore, acreage demanded cannot increase unless inventoried objectives change. However, the intensity of demand can increase and is expected to. It is assumed that intensity of demand will increase at the population growth rate. The demand figures in Table II-1 represent increases from the base year (1990) equal to expected increases in population. These figures are expressed as an index relative to the base year.

Table II-1. Relative Demand for Scenic Quality

Year	1990	2000	2010	2020	2030
Demand Index	100	109	116	126	134

Potential Supply

The maximum supply of scenic quality is limited only by the size of the Forest. Given multiple-use management goals, however, it is reasonable to consider supply in terms of inventoried VQOs. In this context, and including Retention and Partial Retention areas only, the existing supply of scenic quality is

KEY ISSUE-RELATED OUTPUTS

presently 80,000 acres--the area currently meeting Visual Quality Objectives. Through time, this figure will reach 90,100 acres (the potential supply) as the remaining areas reach vegetative conditions that meet VQOs. If the areas having the Preservation VQO are also included, the total potential supply of scenic quality (in areas where limitations on management practices are necessary to meet VQOs) becomes approximately 179,800 acres.

RECREATION

The Olympic National Forest plays an important role in providing developed and undeveloped recreational opportunities in the northwest corner of the State of Washington. Situated on the Olympic Peninsula, a scenic wonderland enriched with many recreational attractions, the Forest offers a wide variety of activities and settings. Opportunities for camping, picnicking, fishing, hunting, backpacking, auto touring, and hiking are among the more common and popular activities available. Unique activities such as clam digging, oyster picking, and scuba diving are also available.

The Forest also provides opportunities for recreating in a range of unique forest settings. The Olympic Rain Forest, saltwater beach and tidelands, rugged, mountainous high country, and large lowland lakes are major attractions. The Forest also provides a wide range of environments offering different experiences. These include Primitive settings, which involve high probability of isolation from the sights and sounds of man and a high degree of risk and challenge. At the other end of the range are Roaded and Rural settings, where opportunity for affiliation with other user groups is high, and risks and challenges are much less likely to occur.

Recreational opportunities on the Forest also include facilities and areas that have national and regional significance. Lake Quinault Lodge is a large, rustic resort with dining room, swimming pool, gift shop, and bar. Nestled in the Olympic Rain Forest on the south shore of Quinault Lake, this lodge provides year-long use. The Quinault Lake area also has several developed Forest Service campgrounds, picnic areas, and 68 recreational residences. Visitors to this popular area have a unique opportunity to drive or walk through one of the world's few temperate rain forests. Dense ferns, emerald moss and lichens, and giant old-growth conifers are common features within the Olympic Rain Forest.

In 1984, the Washington State Wilderness Act established five Wildernesses on the Olympic National Forest. Ranging in size from about 2,340 acres to over 44,000 acres, these new Wildernesses provide a variety of rugged, mountainous settings, attracting visitors from throughout the Pacific Northwest. These Wildernesses provide the most rugged and primitive experiences available on the Forest.

The eastern half of the Forest is within two hours driving time for most of the 2.5 million residents of the lower Puget Sound area (Kitsap, King, Mason, Pierce, Snohomish, and Thurston Counties). In 1986, total recreation use on the Olympic National Forest was ranked 9th among the 19 National Forests in the Pacific Northwest Region (Washington and Oregon). Recreation Visitor Days of use for 1986 was 1,469,600. A Recreation Visitor Day (RVD) is a measure of recreation use that represents 12 hours of participation in recreational activities on the Forest. It could be one person for 12 hours or 12 people for one hour each. Auto touring, camping, resort lodging, hunting, picnicking, hiking, recreational residence use, and gathering forest products are the most popular activities on the Forest. Undeveloped recreation accounts for roughly 70 percent of the Forest's annual RVDs of use, while recreational use at developed sites accounts for the remaining 30 percent.

There are other public land management agencies involved in providing significant recreational opportunities on the Olympic Peninsula. The Olympic National Park is a major provider with 916,136 acres. Over 876,500 acres or 96 percent of the Park is classified as Wilderness. The Park's Wilderness plays a major

role in providing opportunities at the Primitive end of the Recreation Opportunity Spectrum. The other 4 percent of the Park provides Roaded recreation opportunities. The Park recorded over 3,474,700 visits in 1986. The Department of Natural Resources and Washington State Parks also play an important role in providing recreation opportunities and facilities, especially at the Roaded end of the Spectrum. There are also a few private landowners with developed recreation facilities that are providing additional Roaded recreation opportunities.

Current Management

The recreation opportunities offered on the Forest can be divided into three distinct groupings: developed, undeveloped roaded, and dispersed unroaded. The third group consists of the Primitive, Semi-Primitive Non-Motorized, and Semi-Primitive Motorized Recreation Opportunity Spectrum (ROS) classes, and can be further subdivided into Wilderness and non-Wilderness use. Continuation of current management direction will have a different effect on each of these categories of recreation opportunity.

With respect to developed recreation opportunity, the goal of current direction is to continue to meet demand. Sites having potential for development have been identified, and development of these will occur as dictated by increases in demand. Assuming that adequate funding is available, the attainment of this objective should be entirely feasible well into the 21st century.

Undeveloped roaded recreation opportunities should also be adequately provided if current management is continued. In fact, expansion of the road system as new timber harvest areas are accessed will increase availability of this type of recreation opportunity. However, while overall opportunity will increase, it is anticipated that the quality of undeveloped roaded recreation experiences will decrease. Declines in scenic quality and the overall "naturalness" of the forest environment will be the principal causes of this quality reduction.

Recreation opportunities within Wilderness will remain constant under current direction. Use figures indicate that the theoretical capacity of the Forest's Wildernesses to provide high quality Wilderness experiences is currently being exceeded. Projections of future use indicate that this will continue to be the case, even if it is assumed that currently proposed trail development (which will expand capacity to some extent) occurs as planned. Given that the present acreage of Wilderness is fixed, there is little opportunity (beyond trail construction) to expand the capacity to provide high quality experiences.

The situation within the Primitive and Semi-Primitive ROS classes outside Wilderness is similar to that within Wilderness. Existing use exceeds the theoretical capacity of these areas to provide high quality experiences, and this condition will continue even if planned trail system expansion occurs. The key difference between these areas and Wildernesses is that continuation of current management will result in a substantial decrease in the acreage (outside Wilderness) providing dispersed unroaded recreation opportunity. At present, there are 60,590 acres in the Primitive and Semi-Primitive ROS classes outside Wilderness. Continued implementation of current direction would reduce this to approximately 35,800 acres, with much of the reduction occurring in the next 10 years.

Demand

Projected demands for developed, undeveloped, and Wilderness recreation opportunities are presented in Table II-2. These projections were derived from population growth estimates and predicted changes in use patterns used in the development of the Washington Statewide Comprehensive Outdoor Recreation Plan (SCORP). Base year data represent actual use in 1986.

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These estimates are based on expected desire for use of the forest environment as it exists today and is projected to exist in the future under current levels of forest management activity. It is likely that the actual use patterns of the future will depend to some extent on the overall recreational quality of the total forest environment, especially for those forms of recreation for which the future supply is essentially "fixed" (developed, roaded undeveloped, Wilderness). If future levels of timber harvest activity, timber haul traffic, etc. are high, it is projected that participation in these forms of recreation will be somewhat lower than would occur within a more "natural" recreation environment. Therefore, the true "demand" for recreation (as expressed in terms of actual use) will probably depend on the effect of the overall Forest environment on the quality of the recreation experience in addition to factors external to the Forest (population growth and use pattern changes).

Table II-2. Acres, RVD Capacity and Demand by ROS Class

Type and ROS Class	Total Acres	RVD Capacity	RVDs in thousands			
			1986 RVD	1990 RVD	2000 RVD	2030 RVD
Developed (All Activities)		421.7	367.2	379.3	428.6	561.5
Developed (Camping Only)		164.5	184.3	189.8	214.5	281.0
Undeveloped Non-Wilderness:						
Primitive	4,901	.5	1.6	1.7	1.9	2.6
Semi-Primitive, Non-Motorized	49,090	38.4	39.1	40.3	45.5	61.0
Semi-Primitive, Motorized	6,599	2.9	6.2	6.4	7.2	9.7
Roaded Natural & Modified	478,370	1,912.7	961.9	990.8	1,119.6	1,500.3
Rural	5,099	20.2	4.7	4.8	5.4	7.2
Wilderness:						
Primitive	36,020	17.2	29.3	30.0	33.0	43.2
Semi-Primitive	52,245	48.4	59.6	61.1	67.2	88.0
FOREST TOTAL	632,324	2,472.0	1,469.6	1,514.4	1,708.4	2,273.5

Note: 1986 RVDs based on RIM Report 2300. 1990-2030 RVD projections based on SCORP and State of Washington's Forecasting and Support Division of the Office of Financial Management.

Table II-3 shows "persons at one time" (PAOT) capacity needed to meet demand for developed camping and Table II-4 shows miles of trail needed to meet demand for trails.

Table II-3. Projected Demand for Developed Site Capacity

		PAOT Demand per Decade (thousands)				
	Existing Capacity	1	2	3	4	5
Capacity (PAOT)	2.3	4.6	5.0	5.5	6.1	6.7

Table II-4. Projected Demand for Trails

		Demand for Trail Miles by Decade				
	Existing Miles	1	2	3	4	5
Miles of Trail	227	279	310	344	382	424

Potential Supply

The maximum potential outputs of the various types of recreation opportunity are displayed in Table II-5. The developed recreation estimate is based on full development of all identified potential sites and a 30 percent occupancy rate. The potential supply of undeveloped roaded opportunity reflects the current capacity of the Forest to provide this experience. Since this is well above expected demand and not likely to fluctuate greatly over time, further refinement of this estimate was not necessary.

The potential availability of Primitive and Semi-Primitive recreation opportunity, both within and outside Wilderness, was developed in two different ways. The lower of the supply estimates shown in Table II-5 is the theoretical capacity to provide high quality experiences in areas presently within these ROS classes. Also displayed are levels of current use (as of 1986) expanded at the same rate as the demand projections displayed in Table II-2. These figures are used as "potential supply" projections. They reflect the levels of use that can be assumed to actually occur (based on demand) if all existing Primitive and Semi-Primitive opportunities are retained. Completion of planned trail systems is assumed in both estimates.

To demonstrate the relationship between current management and anticipated demand, the projected supply of Primitive/Semi-Primitive recreation opportunity (outside Wilderness) associated with current direction is also displayed in Table II-5. This is also based on expansion of current use in response to demand, but only within those areas retained within the relevant ROS classes.

Table II-5. Recreation Supply Potential
(Thousand RVDs/Year)

			Primitive and Semi-Primitive				
			Outside Wilderness			Within Wilderness	
Year	Developed	Undeveloped Roaded	Theoretical Capacity	Demand Based	Current Direction	Theoretical Capacity	Demand Based
1990	655.2	1,932.9	51.5	48.4	28.5	87.1	91.1
2000	655.2	1,932.9	51.5	54.6	32.1	87.1	100.2
2010	655.2	1,932.9	51.5	60.2	35.4	87.1	109.6
2020	655.2	1,932.9	51.5	66.4	39.1	87.1	119.9
2030	655.2	1,932.9	51.5	73.3	43.1	87.1	131.2

OLD-GROWTH FOREST

Old-growth is critical to the survival of some wildlife species, such as the northern spotted owl, and highly desirable for others, such as the pine marten and pileated woodpecker. It is also desirable for its role in providing natural settings for recreation experiences, scenic backdrops, and sources of large organic debris (an important part of instream fish habitat). Retention of existing old-growth will provide habitat for wildlife dependent upon mature or older forest habitat. Fish habitat, watershed condition, and recreational environment will generally be maintained by retention of existing old-growth. At the same time, retention of old-growth reduces the availability of timber for harvest. Although old-growth conditions can be recreated after an area is harvested, the length of time needed to achieve the necessary characteristics can exceed 200 years.

Additional considerations relating to old-growth include its usefulness in the manufacture of a variety of special products and its significance to American Indians on the Olympic Peninsula. Old-growth trees provide the basic raw material for cedar shakes and shingles, clear veneer, and planking for wooden boats. When old-growth is harvested for uses other than these special products, the available supply decreases at an accelerated rate. Western red cedar, especially old-growth, has a profound meaning and place in American Indian religious, ceremonial, and traditional values. A special reverence is held for the traditional uses of cedar resources. Please refer to Chapter III and Appendix K of the FEIS regarding this issue.

At present, there are about 266,800 acres of old-growth on the Forest. This represents about 42 percent of the total Forest area, and 46 percent of the forested land. About 46,800 total old-growth acres are in Wildernesses. Approximately 170,000 acres of this old-growth total are considered to be tentatively suitable for timber production. Inventories planned for the first three years of the decade will update information concerning location and stand characteristics of potential old-growth. In areas of previous intensive harvesting, old-growth stands are small and fragmented.

Current Management

Under current management, old-growth will be retained as needed to meet the Management Requirements established for northern spotted owl habitat, bald eagle nesting sites and wintering areas, and riparian area vegetative conditions. In addition, several old-growth stands will be retained in areas allocated to the production of nontimber outputs, such as undeveloped recreation areas. Nonetheless, much of the old-growth which is tentatively suitable for timber production will be scheduled for timber harvest under current management direction. This would result in a reduction of the total acreage of old-growth from the present 266,800 acres to about 173,000 acres by the end of the fifth decade.

Demand

Demand for the retention of old-growth is difficult to assess precisely. The numerous values associated with old-growth forest, however, make it clear that every acre of existing old-growth serves a valuable purpose in the eyes of at least some segments of the public. Therefore, it is assumed that the "demand" for old-growth retention equates to the currently available supply of 266,800 acres, and that every acre of old-growth that is retained will contribute to the satisfaction of an existing demand. What is more, recent national attention on the old-growth issue and dependent wildlife species such as the spotted owl has resulted in an increased interest in retaining this resource.

Potential Supply

In the long run, the potential supply of old-growth consists of all currently existing old-growth plus all areas capable of eventually reaching an old-growth condition. At present, however, it is most useful to consider the potential supply of old-growth to be that which is currently available, or 266,800 acres.

TIMBER HARVEST LEVEL

Of the nearly 584,000 acres of Olympic National Forest land that support tree growth, about 447,000 acres (77 percent) are presently classified as tentatively suitable for timber production. See Table IV-3 in Chapter IV of this Plan for the stratification of Forest land suitability. The productivity of these lands ranges from 20 to over 200 cubic feet per acre per year, with an average productivity of 120 cubic feet. Existing timber management plans include 507,930 acres of tentatively suitable land. Timbered lands considered unsuitable (23 percent) include Wilderness and the Quinault Research Natural Area, areas not capable of being regenerated within five years, and areas where unacceptable damage to soil and/or water would occur if harvest was conducted.

The current potential yield of timber from the Olympic National Forest, as specified in existing timber management plans, is 59.8 million cubic feet per year (330.5 million board feet), with an estimated stumpage value of \$43.6 million. If harvest from Simpson Timber Company land within the Shelton CSYU is added, the total output becomes 441.8 million board feet annually, or enough lumber to construct 36,800 average sized three-bedroom homes. This figure represents the volume that meets current utilization specifications. If material that does not meet current specifications (dead trees, cull material, and fuelwood material) is included, the total fiber output level reaches approximately 492 million board feet in an average year.

Timber output from the Forest is influenced by a wide range of existing plans and legal entities. Annual harvest volumes are established by three separate timber management plans. Four land-use plans dictate harvest locations through allocation of lands to resource uses. Two established sustained yield units limit the location of mills that can process the trees removed from 46 percent of the lands suitable for timber production. The relationships among these interacting timber management plans, and the harvest volumes associated therewith, are displayed in Table II-6.

KEY ISSUE-RELATED OUTPUTS

Table II-6. Current Chargeable Annual Allowable Sale Quantity

Management Plans				
Timber	Land	Ranger District	Annual Volume	Area Covered and General Comments
Quinault 1969	Quinault 1976	Quinault	86.9 MMBF 14.5 MMCF	Grays Harbor Federal Sustained Yield Unit. Control is sold volume.
Shelton 1977	Incorporated within the Timber Resource Plan	Hood Canal Simpson Timber Co. Total Unit	115.7 MMBF 21.6 MMCF 113.3 MMBF 21.7 MMCF 227.0 MMBF 43.3 MMCF	Shelton Cooperative Sustained Yield Unit jointly managed by the Forest Service and Simpson Timber Company. The unit was established by an agreement that terminates in 2046. Control is harvested volume.
Peninsula 1968	Soleduck 1975 Canal Front 1979 Satsop Block 1979	Soleduck Hood Canal Quilcene Hood Canal	127.9 MMBF 23.7 MMCF	Includes all remaining National Forest land. The Satsop Block originally was not part of any Timber Plan, but subsequently has been added to the Peninsula Plan. Control is sold volume.
Total Volume meeting utilization specifications all NF lands.			330.5 MMBF 59.8 MMCF	
Total Volume meeting NF and Simpson Timber Co. utilization speci- fications.			441.8 MMBF 81.5 MMCF	

Current Management

Implementation of current management direction, including the means of meeting Management Requirements and the revised assessment of timberland suitability, will result in a drop of 83.6 million board feet from currently planned harvest levels. The harvest volume associated with extension of current direction into the future is 358.2 million board feet per year. This output is based on continuation of the nondeclining flow harvest policy and includes harvest from Simpson Timber Company land within the Shelton CSYU.

Under current direction, timber output is one of the primary emphases of land management. Land allocations reflect this emphasis, as most areas in which timber management can be conducted effectively are allocated to timber production. The level of timber output associated with current direction will, if all volume offered is sold and harvested, provide approximately 4,800 person-years of employment annually on the Olympic Peninsula. This is close to 10 percent of the total Peninsula labor force.

Demand

Future demand for Forest timber is expected to be shaped by the interactions of two factors: reduced availability of timber on non-Forest lands and continued strong demand for western Washington wood products. As is the case for Pacific Northwest region demand as a whole, demand for western Washington timber (and thus Forest timber) is presently high relative to historic levels. The influx of inexpensive timber from western Canada and the expansion of the market area of timber from the South precipitated a major slump in western Washington's timber industry in the early 1980's. Over the past five years, however, there has been a strong resurgence of demand for western Washington timber, and recent harvest has been considerably above historic levels. It is expected that the current high level of demand will moderate in the 1990's and beyond, although continuing peaks and valleys will occur in response to market cycles. It is further expected that the long-term average demand for Peninsula timber will lie between the average harvest level experienced in the 1980-1988 period and the average harvest of the 1970's.

If demand for Peninsula timber approximates the projected level, supply availability will soon become the critical factor limiting the vigor of the local timber industry. Current projections indicate a substantial drop in timber availability, beginning in the 1990's and extending throughout the next 50 years. Lack of raw material availability may make it impossible for Peninsula mills to take advantage of anticipated levels of demand.

The overall timber supply situation on the Peninsula should soon become the dominant factor in determining demand for National Forest timber. With timber availability from non-National Forest sources declining, this demand is expected to be quite strong. While attempting to quantify the future demand for Forest timber is a highly uncertain undertaking, such an estimate is useful in relating National Forest harvest levels to the overall Peninsula timber supply/demand situation. Therefore, projections have been made of the possible range in which demand for National Forest timber could lie in future decades. These projections are presented in Table II-7. They are based on the following assumptions:

1. The average annual Peninsula-wide harvest level of the 1980-88 period represents the lower limit of future demand for Peninsula wood products, while the 1970-79 level represents the upper limit. Under this assumption, future demand for Peninsula wood products will lie between 1,695 and 1,785 million board feet per year, a range of 90 million board feet. In this context, "demand" is defined as the volume of Peninsula harvest that would be consumed in final product form (lumber, pulp and paper products, plywood, logs for export) in the wood products market, given that Peninsula forests are able to supply the amount demanded.
2. Demand for National Forest timber can be projected by subtracting estimated non-National Forest harvest from estimated demand for final products. In this context, "demand" (for National Forest timber) is defined as the volume of Forest timber that would be purchased (if available) by Peninsula mills in response to the combination of demand for final products and supply of timber from other sources. This assumes that the demand for exportable logs is fully filled from non-National Forest sources, with National Forest timber helping to fill the needs of local mills.

For further discussion on the development of supply and demand estimates, refer to FEIS Chapter III, "Vegetation" ("Future Trends" section).

**Table II-7. Projected Demand for National Forest Timber
(Million Board Feet per Year)**

Period	Estimated Total Demand	Non-National Forest Harvest	Demand for National Forest Timber ^{1/}
1980-1988 ^{2/}	1,695	1,315	380
1990-1999	1,695-1,785	1,140-1,220	475-645
2000-2009	1,695-1,785	1,145	550-640
2010-2019	1,695-1,785	1,070-1,150	545-715
2020-2029	1,695-1,785	1,165	530-620
2030-2039	1,695-1,785	1,155	540-630

^{1/} Including harvest from Simpson Timber Company land within the Shelton CSYU.

^{2/} Average annual experienced harvest levels.

Potential Supply

The above projections of demand for National Forest timber represent estimates of the volume that would be purchased if it were available. In actuality, it is not possible for National Forest timber to be supplied at the levels necessary to satisfy projected demand over the next 50 years. The Forest's timber output capacity, under nondeclining flow and assuming full application of Management Requirements, is 380.2 million board feet per year (including harvest from Simpson Timber Company land within the Shelton CSYU), as determined by Benchmark 7T. If departure from nondeclining flow is considered, supply potential becomes 463.8 million board feet per year in the first decade. This output level, which cannot be sustained past the second decade, is derived from Alternative B-Departure (Modified).

SEDIMENT

While sediment is not a desired product of forest management, and therefore not an "output" in the usual sense, it is included in this discussion because of its effect on two important (and closely related) concerns: water quality and fish habitat. Both of these variables can be adversely affected by sediment, with degree of effect depending on extent of sedimentation. This, in turn, depends largely on the level of sediment-generating activity (particularly the construction, reconstruction, and use of Forest roads) associated with management of the Forest. Approximately 192,000 tons of sediment (current situation, 1988) are generated annually by management activities. This is in addition to the natural rate of sedimentation of about 112,500 tons per year. It should be noted that these sediment output estimates are highly imprecise and are not suitable for determining compliance with Federal and State water quality standards. They are being used as an index to facilitate comparison of alternative activity levels rather than a concrete projection of sediment generation. See FEIS Chapter IV, "Water" section, for further clarification.

Current Management

Continuation of current management direction is expected to result in a decrease in sediment output, with the sediment index lowering to 161,600 tons per year in the first decade. This is due largely to lower levels of timber harvest activity. After the first decade, the sediment index is expected to drop to approximately 145,500 tons per year, due to both reduced road construction and a decrease in road use (timber haul)

because of reduced timber harvest from National Forest land within the Shelton CSYU. Average sediment output over the first five decades is estimated at 145,200 tons per year.

FISH HABITAT

The salmon and trout species produced and/or reared within aquatic habitats of the Forest contribute to the sport and commercial fisheries resources of the Olympic Peninsula. This is especially true for sea-run or anadromous species that spawn within Forest freshwater habitats, then migrate to the ocean to grow to adults. The majority of these species are captured in the ocean, or in rivers downstream from the Forest during their return spawning migrations.

The actual portion of Olympic Peninsula anadromous fish produced on-Forest is unknown. However, using river miles of habitat accessible to anadromous fish as a guide, National Forest management can directly influence 43 percent of the total habitat within those drainages that flow through the Forest. Fifteen percent of the total habitat in these drainages is within the National Forest boundary. Twenty-eight percent is downstream from the boundary and can be influenced by Forest activities. The remaining 57 percent is upstream, or tributary to downstream reaches, and is not directly influenced. Thus, the fisheries resources influenced by the Forest are significant. Many coastal communities and American Indian tribes on the Peninsula rely on recreational and commercial fisheries revenues.

In addition to managing on-Forest fisheries habitat, the Forest Service is responsible for maintaining water quality and fish passage within all river systems that drain the Forest. The importance of this is that roughly 28 percent of the river miles accessible to anadromous fish that can be influenced by Forest Service activities occur downstream, on State and private lands. Maintaining fish passage is also important because about 20 percent of the river miles accessible to anadromous fish are located upstream from the Forest, in Olympic National Park.

There are approximately 350 river miles, or 1,507 surface acres, of habitat on the Forest currently accessible to anadromous fish. In addition, there are approximately 424 river miles, or 773 surface acres, of isolated stream habitat that presently support resident fish populations. In addition to the stream habitat, there are 44 lakes or reservoirs that provide an additional 3,416 surface acres of suitable habitat. The total fish habitat is approximately 5,696 surface acres.

Current habitat management direction is to maintain or enhance fisheries habitat by preventing or mitigating adverse effects on fisheries resulting from Forest resource management activities. Habitat enhancement projects are implemented as funding becomes available.

Actual fish production information for suitable habitats located on-Forest is not available. Current production or habitat capability estimates were made based on data provided by the Washington State Departments of Wildlife and Fisheries. This information was utilized to generate Habitat Capability Indices for each of the major drainages on the Forest. The capability indices for anadromous fish production assume that enough adult fish return to the various river systems to adequately seed available habitat under existing environmental conditions. Resident fish capability estimates for streams were developed in a similar manner. Stream Habitat Quality Indices were also developed to estimate current habitat conditions. These estimates were primarily derived from predicted effects of current nonnatural sediment outputs. The existing habitat quality and capability estimates were used to estimate current levels of production of fishery-related outputs. At present, it is estimated that Forest fisheries are producing 1,122,700 pounds of anadromous commercial catch and 26,600 Wildlife and Fish User Days (WFUDs) of recreation use per year.

KEY ISSUE-RELATED OUTPUTS

Current Management

There are several aspects of current management direction geared toward the maintenance and protection of fish habitat. Among these are the Management Requirements applicable to riparian areas, road closures aimed at reducing sediment output, road construction and maintenance standards designed to lower road-related siltation, and a range of site-specific habitat enhancement projects. The overall goal of management is to maintain fish habitat quality at a level equal to, or greater than, that which presently exists.

Analysis of the effects of continuing current management indicates that, over time, fish habitat condition can be expected to improve slightly. The basic assumption behind this determination is that sediment level is the principal factor influencing habitat quality. Overall levels of activity-generated sediment are expected to decline in future decades, due to both reduced road construction and reduced harvest activity on National Forest land. This decline in sediment output should result in an increase in fish habitat quality. The projected levels of fishery-related outputs associated with continuation of current direction are displayed in Table II-8. The outputs shown do not include the effects of fish habitat enhancement projects.

Table II-8. Projected Fisheries Outputs

Decade	Anadromous Commercial Catch (Thousand lbs./year)	Anadromous Recreation (Thousand WFUDs/year)	Inland Recreation (Thousand WFUDs/year)
1	1,133	16.4	11.7
2	1,160	17.0	11.1
5	1,166	17.2	11.7

Demand

There are three principal sources of demand for fisheries outputs: commercial fishing, ocean sport fishing, and freshwater sport fishing. In the case of all three, available supply falls far short of "demand," and will do so at any reasonably achievable output level. The assumption is that people who engage in fishing do so with the expectation of success, and the higher the success rate, the greater the satisfaction level (and profit level, in the case of commercial fishing). Therefore, any increase in fish population will increase satisfaction, and will be "demanded."

In order to provide a meaningful basis against which various output levels can be assessed, demand indices were developed on the basis of anticipated growth in population. The intent of these indices is to reflect the growth in outputs needed to maintain overall user satisfaction at present levels through time. The assumption is that outputs must increase at the same rate as population if the current level of satisfaction is to be maintained. Demand indices, and the future fishery output demand levels they imply, are displayed in Table II-9.

Table II-9. Relative Demand for Fishery Outputs

Decade	Demand Index	Anadromous Commercial Catch (Thousand lbs/year)	Anadromous Recreation (Thousand WFUDs/year)	Inland Recreation (Thousand WFUDs/Year)
1	100	1,554	24.1	16.1
2	109	1,694	26.3	17.5
5	134	2,082	32.3	21.6

Potential Supply

The potential output level of Forest fish habitat was developed on the basis of complete elimination of nonnatural sediment from existing habitat. While such a condition would not be feasible in the near future, it could, in theory at least, be attained over time if all sediment-generating activity were to be eliminated and all existing roads revegetated. If such a state were to be reached, the associated outputs are estimated to be 1,400,000 pounds of anadromous commercial catch and 36,000 WFUDs of recreation per year.

WILDLIFE HABITAT

Wildlife habitat on the Olympic National Forest is made complex by the Olympic Peninsula's relationship with the sea. The nearness of saltwater, weather patterns, the extensive river network, and flat, stable flood plains giving way to sharp unstable interior mountains create a wide range of habitat and animal diversity. Prevailing winds and the Peninsula's isolation from the Cascades and the southern coastal range have generally prevented interbreeding of many nonmigratory wildlife species. The Olympic marmot, Roosevelt elk, and Cope's salamander are wildlife subspecies that have been influenced by geographic isolation.

The wildlife resource on the Forest is also heavily influenced by the presence of Olympic National Park. The 916,000 acres of the Park provide additional habitat for species that spend a portion of each year on the Forest. This habitat allows genetic interchange and provides big game summer and winter range, northern spotted owl habitat, and habitat for both game and nongame birds and animals.

The Forest provides habitat for 61 species of mammals, 226 species of birds, 7 reptile species and 15 amphibian species. A full list of the species, and their related habitat needs, is available in files on the Forest. Although most wildlife species use several or all vegetative age classes, many are oriented to either early or late successional stages. Availability of habitat in either the early or late stages of forest growth, therefore, strongly influences both abundance and diversity of associated wildlife species.

This response to changes in structural habitat components in the environment (ecotype, stand condition, and special habitat features) provides a framework from which to estimate the effects of management activities on wildlife species. Based on their responses to changes in habitat conditions, certain birds and mammals have been identified as indicator species. Each indicator species represents an association of other animals that associate with the same set of structural components. It is assumed that management which maintains or enhances the habitat of indicator species will likewise maintain or enhance that of its "association." Seven species, or groups of species, have been selected as indicator species. These are:

Bald Eagles. The bald eagle is a Federally listed threatened species sensitive to management of riparian areas. Mature timber is needed for nesting and roosting. At present, 16 nest sites are protected. This is the Forest's share of sites determined necessary by the U.S. Fish and Wildlife Service's draft recovery plan

KEY ISSUE-RELATED OUTPUTS

(1984) for bald eagle habitat. Sufficient unoccupied habitat exists to support significantly greater numbers. With decreased harassment and continued food availability, populations can be expected to increase.

Northern Spotted Owl. The spotted owl inhabits old-growth forests and serves as an indicator for other wildlife species using this habitat. Continuing inventories indicate that many potential areas are currently occupied. Thirty Spotted Owl Habitat Areas (SOHAs) averaging 3,000 acres each have been identified by the Forest as the means of meeting Management Requirements regarding spotted owl population viability. As of 1989, 23 of these have verified breeding territories as defined by Regional standards.

Pileated Woodpecker and Pine Marten. The pileated woodpecker and marten represent species that inhabit mature conifer habitat. While each requires mature conifer, home range and distribution requirements are different. Habitat exists to support high numbers of both pileated woodpeckers and martens. However, the marten's solitary and secretive behavior patterns, combined with lack of observations on the Forest, lead to the conclusion that very little of this habitat may actually be occupied by marten.

Primary Cavity Excavators. This group of species represents snag-dependent cavity nesters. This large group represents the woodpecker group of birds dependent on snags of varying sizes for feeding, resting, and nesting. Current snag density is at a level capable of supporting high numbers of these species. However, snag density in younger stands is often suboptimal.

Columbian Black-Tailed Deer and Roosevelt Elk. These two species are identified as management indicator species in the 1980 RPA Program. The Columbian black-tailed deer is the most abundant game species on the Olympic National Forest. The most recent estimate of herd size which can be supported by Forest habitat is 6,500 animals, with over one-third of these on the southern portion of the Hood Canal Ranger District. Peninsula-wide, deer populations appear to be increasing. The deer and elk harvest is expected to provide an average at 27,260 Wildlife and Fish User Days (WFUDs) of recreation for the next 10 years. Forest populations appear to be increasing as a result of increased forage availability following timber harvest activities. The Roosevelt elk is a popular game species, and is also the focus of public concern. The most recent estimate of the number that Forest habitat can support is 3,200 elk, with over 80 percent occurring on the Westside zone. There appears to have been a Peninsula-wide population decline over the last decade. The reason for this decline in population numbers may be timber harvest activities on State, private, American Indian, and Federal lands, which reduces thermal and hiding cover. An increase in hunting pressure may also have contributed to the population decline.

Current Management

Goals for the management of wildlife habitat focus on two separate concerns: maintenance of sufficient habitat to assure viable populations of indicator species, and satisfaction of demand for consumptive uses of wildlife (primarily hunting). The former concern is addressed by establishment of ways or means of meeting Management Requirement specifications for habitat maintenance. Under current management, these are as follows:

- 30 spotted owl habitat areas (SOHAs) averaging 3,000 acres each
- 16 bald eagle nest sites and wintering areas (6 of which are partially included in owl, pileated woodpecker, or marten areas)
- 56 300-acre pileated woodpecker areas (most of which are included in SOHAs)
- 155 160-acre pine marten areas (most of which are included in SOHAs and pileated woodpecker areas).

Based on current information, these habitat allocations will be sufficient to assure maintenance of viable populations of indicator species.

Response to the second concern is measured in terms of the Wildlife and Fish User Days (WFUDs) of recreation projected to be available as a result of vegetative conditions and the wildlife populations they will support. Such estimates are linked directly to elk and deer populations, as these are the principal species receiving hunter use on the Olympic National Forest. At present, approximately 49,950 wildlife-related WFUDs are produced each year by Forest habitat. Continuation of current management is expected to result in little change in this output over the next 20 years--50,911 WFUDs per year are anticipated in the first decade, 47,735 in the second. By the fifth decade, however, the conversion of substantial acreages to younger age classes as timber harvest progresses may result in some decline in elk and deer populations. An output of 41,214 WFUDs per year is projected for this period.

Demand

Available information indicates that the demands of hunters and other wildlife "consumers" will always exceed the capacity to supply animals. If it is assumed that people actively engaged in hunting do so with the expectation of being successful, "demand" will never be met. Demand for nongame species is assumed to be met if viable populations are maintained.

As was done for fishery-related outputs, wildlife demand indices were developed on the basis of anticipated growth in population. These represent the level of output needed to maintain overall user satisfaction at today's level. The indices reflect the assumption that outputs must increase at the same rate as population in order to continue providing the same degree of user satisfaction. These demand indices, and the future wildlife output demand levels they imply, are displayed in Table II-10.

Table II-10. Relative Demand for Wildlife Outputs

Year	Demand Index	Projected Demand (Thousand WFUDs/Year)
1990	100	58.3
2000	109	63.5
2030	134	78.1

Potential Supply

The potential supply of wildlife-related recreation output was estimated on the basis of an assumed timber harvest regime that would optimize deer and elk habitat conditions. Such a program would limit timber harvest below 1,500 feet in elevation, while requiring a harvest program that would be evenly distributed in both space and time above 1,500 feet. This hypothetical program would produce an estimated 56,300 WFUDs of wildlife-related recreation per year.

UNROADED AREAS

Unroaded areas serve an important role as the undeveloped portions of the National Forest for which Wilderness is a future option. Generally speaking, once an area is roaded it is no longer considered potential Wilderness. Timber harvesting, however, does not necessarily result in irreversible removal of

KEY ISSUE-RELATED OUTPUTS

land from future consideration as Wilderness. For example, there is presently an area within The Brothers Wilderness that, although harvested in the past, now appears natural to the casual observer.

Unroaded areas also provide opportunities for recreational activities associated with the Primitive end of the Recreation Opportunity Spectrum (ROS). Unroaded areas, like Wilderness, provide recreational opportunities associated with unmodified or predominantly natural-appearing environments. They provide opportunities for solitude, and for activities that will test a person's outdoor skills. Hiking, mountain climbing, undeveloped camping, hunting, fishing, trail bike and horseback riding, and gathering forest products are some of the more popular recreational activities associated with unroaded areas. Unroaded areas also serve as scenic backdrops (South Quinault Ridge, Green Mountain, and Mt. Baldy) to popular recreation areas and travel routes.

Wildlife also benefits from unroaded areas. Spotted owls and other old-growth or mature habitat dependent species, such as pileated woodpeckers and flying squirrels, inhabit these areas. Unroaded areas also provide undisturbed habitat for big game species such as elk and deer.

There are 13 unroaded areas inventoried on the Olympic National Forest. These range in size from 490 acres to over 19,000 acres, with the average size being approximately 6,600 acres. In total, the Forest has approximately 85,800 acres in unroaded areas. Refer to FEIS Chapter III, Table III-39, for the acreage of each unroaded area.

Current Management

Because of the timber production emphasis associated with current management, the continuation of current direction will result in a substantial reduction in the acreage in unroaded areas. Of the 85,800 acres currently having unroaded status, approximately 50,500 would remain if current land use allocations and management direction are continued. Most of this reduction will occur within the first ten to twenty years of the planning horizon, as road access is developed and areas are harvested. Only the McDonald unroaded area would remain 100 percent unroaded under current management. Many of the unroaded areas allocated to timber harvest in current plans involve timber management costs which exceed projected revenues.

Demand

Segments of the public have expressed interest in retaining all currently inventoried unroaded areas in their present condition. Therefore, it is assumed that demand exists for maintaining the full 85,800 acres of unroaded area in an undisturbed state.

Potential Supply

Although areas which have been harvested can, in time, return to a condition that can be classified as "unroaded," it is most practical to consider the potential supply of unroaded areas to consist of those which currently exist. Therefore, potential supply is estimated at 85,800 acres.

WILD AND SCENIC RIVERS

The intent of including a river in the National Wild and Scenic River System is to preserve the free-flowing condition of the river itself, as well as the characteristics of the river's immediate environment, for the benefit and enjoyment of present and future generations. When the Wild and Scenic Rivers Act was passed in 1968, Congress meant to provide a means for recognizing selected rivers which, along with their immediate environments, possessed outstandingly remarkable scenic, recreation, geologic, fish and wildlife, historic, cultural or other similar values.

The Olympic Peninsula does not presently have any designated Wild and Scenic Rivers. However, the Heritage Conservation and Recreation Service, now part of the National Park Service, has listed six rivers flowing through the Forest as having potential for classification as Wild, Scenic or Recreational rivers. These are the Dosewallips, Duckabush, main stem and West Fork of the Humptulips, Hoh, Bogachiel, and Soleduck Rivers. These were identified in a January 1982 document titled "Nationwide Rivers Inventory."

Using that document as a starting point, the Forest has evaluated a total of seventeen rivers on the Peninsula. These include the six rivers mentioned in the preceding paragraph plus the Dungeness, Gray Wolf, Big Quilcene, Hamma Hamma, Skokomish, South Fork Skokomish, Wynoochee, East Fork Humptulips, Quinault, Calawah and its three main branches, and Elwha Rivers. The purpose was to determine the eligibility, potential classification, and suitability of each of the rivers. Additional information about the process, and the character and resources within each river corridor examined, is available in Appendix F of the accompanying FEIS.

The results of the study led to the determination that the Big Quilcene, Skokomish, and Calawah (including its three main branches) Rivers were not eligible for designation as Wild and Scenic Rivers. In addition, the appropriate lead agency responsible for considering the final designation of the eligible rivers was recommended. The Forest Service is considered to be the logical lead agency for ten of the rivers: Dungeness, Gray Wolf, Dosewallips, Duckabush, Hamma Hamma, the main stem and West Fork of the Humptulips, East Fork Humptulips, Soleduck, South Fork Skokomish, and Wynoochee.

Current Management

It is the intent of this planning process to determine the recommended final classification of the ten Wild and Scenic River candidates for which the Forest Service is the logical lead agency. It is also intended that Forest Plan direction assure that the eligibility of the remaining candidates (the Quinault, Hoh, Bogachiel, and Elwha Rivers) will not be compromised by Forest management activities prior to completion of appropriate classification studies. The National Park Service is considered to be the logical lead agency for these four rivers.

Under existing land management plans, the Duckabush River is the only candidate river recommended for Wild and Scenic River designation. Continuation of current direction would extend this recommendation, while eliminating other candidates from further analysis. Current management direction does not include specific provisions for protecting the qualifying characteristics of the four candidate rivers for which the Forest Service is not the logical lead agency.

Demand

There is a segment of the public that strongly supports designation of all inventoried rivers as Wild and Scenic. With regard to the desires of the public as a whole, however, it is difficult to assess the "demand"

SUMMARY

for such designations. Public input on the subject has been mixed, with some favoring inclusion of the Forest's inventoried rivers in the Wild and Scenic River System and some opposed. Although the intensity of demand is unclear, it may be concluded that there is some level of demand for Wild and Scenic Rivers, and that so classifying a river would, therefore, be responsive to an existing demand.

Potential Supply

The group of ten eligible rivers for which the Forest Service has been determined to be the logical lead agency represents the Forest's maximum practical potential for expanding the Wild and Scenic River System.

SUMMARY

The assessments of demand and potential supply conducted during the Analysis of the Management Situation (AMS) served to identify the "decision space" within which the Forest could operate during development of alternative strategies for resolving public issues and management concerns. This decision space is bounded by the maximum potential output levels of each issue-related resource, and further delineated by the tradeoff relationships that result from resource interactions. While it would be feasible to obtain the maximum output level of each resource individually, producing all of the maxima simultaneously would be impossible. Increased production of one output generally entails reduced production of others.

The resource maximization benchmarks analyzed during the AMS provided estimates of maximum production potential. Analysis of current direction (Alternative A-Current Direction) provided projections of the outputs and effects associated with continued implementation of current management direction, and also established the relationship of present management emphases to the available decision space. Comparison of the output levels of any given benchmark with those of the others provides some insight into the tradeoffs involved in emphasizing the output of a particular resource. For a more thorough discussion of such tradeoffs, refer to the "Benchmark Analysis" section of FEIS Appendix B.

The figures shown in Table II-11 represent average annual outputs or effects. Actual outputs could vary from year to year during any specific decade, but should average to the figures shown over each full decade.

Table II-11. Summary of Demand and Supply Projections for Key Issue-Related Outputs

Annual Resource Output or Environmental Effect	Unit of Measure	Projected Demand	Potential Supply	No Action Alternative	Forest Plan
Areas Assigned to Prescriptions Meeting Preservation, Retention, and Partial Retention Visual Quality Objectives	Acres	179,800	179,800	114,100	179,800
Dispersed Unroaded Recreation Opportunity	1,000 RVDs				
Decade 1		48.4	48.4	28.5	32.4
Decade 2		54.6	54.6	32.1	36.6
Decade 5		73.3	73.3	43.1	49.1
Old-Growth Forest	Acres				
Midpoint of:					
Decade 1		266,800	266,800	248,271	255,815
Decade 2		266,800	266,800	214,428	233,893
Decade 5		266,800	266,800	175,496	186,558
Allowable Timber Sale Quantity (includes Simpson Timber Company output)	MMCF				
Decade 1		112.0	76.5	70.3	60.2
Decade 2		119.0	76.5	70.3	61.8
Decade 5		117.0	76.5	70.3	71.9
Sediment	Tons/Year Index				
Decade 1		0	N/A	161,600	114,600
Decade 2				145,500	131,000
Decade 5				127,000	118,400
Anadromous Fish Commercial Harvest (based on enhanced anadromous habitat potential)	1,000 Pounds of Fish				
Decade 1		1,554	1,400	1,245	1,296
Decade 2		1,694	1,530	1,388	1,397
Decade 5		2,082	1,530	1,401	1,415
Fish-Related Recreation	1,000 WFUDs				
Decade 1		40.2	36.0	28.1	29.2
Decade 2		43.8	39.0	28.2	28.6
Decade 5		53.9	39.0	28.9	29.4
Wildlife-Related Recreation	1,000 WFUDs				
Decade 1		58.3	56.3	50.9	50.9
Decade 2		63.5	56.3	47.7	48.2
Decade 5		78.1	56.3	41.2	41.8
Unroaded Areas Assigned to Unroaded Management Prescriptions	Acres	85,800	85,800	50,500	57,500
Wild and Scenic Rivers	Rivers	14	14	1	3
Present Net Value	Million \$	N/A	592.1	568.5	520.3

INFORMATION NEEDS

This section lists the research and inventory needs identified throughout the development of this Forest Plan. The items listed are considered to be important in monitoring the implementation of this Plan, in developing a more complete data base for use in revising this Plan in ten to fifteen years, or both. Suggested time-frames for completion of each research or inventory item are included. More information is available in the monitoring worksheets included in Appendix B of this document.

RESEARCH AND INVENTORY NEEDS

Recreation

1. Research recreation use by activity, site/area, and ROS classes and develop a reliable method for determining Recreation Visitor Days for undeveloped recreation. Needed by end of fifth year.
2. Conduct a recreation marketing survey to determine the needs and demands of the recreating public on the Olympic Peninsula. Needed by end of fifth year.
3. Research visitor preferences for types and levels of facilities desired at developed recreation sites. Needed by end of fifth year.
4. Research off-road vehicle (ORV) use in specific areas to determine if and how ORVs affect other visitors and resources. Needed by end of fifth year.
5. Continue to inventory undeveloped camping sites both inside and outside of Wilderness. Wilderness inventory needed by end of first year and outside of Wilderness needed by end of fifth year.
6. Research and develop a computerized method for managing undeveloped recreation data. Needed by end of fifth year.
7. Research interpretive programs/facilities to determine if they are accomplishing their intended purposes and if not how they can be improved to do so. Needed by end of seventh year.
8. Research visitor information opportunities and develop self-service information stations that provide reliable and convenient information. Needed by end of eighth year.

Scenery

1. Inventory Forest travel routes and use areas to determine if current use warrants a change in the visitor sensitivity levels. Needed by end of fifth year.
2. Research how Forest visitors perceive the various Forest resource management activities and their visual impacts upon scenery. Needed by end of tenth year.

Wilderness

1. Conduct a field survey to determine if and how management activities and other visitors outside the Wilderness affect the visitor's experiences within the Wilderness as related to the Wilderness Resource Spectrum. Needed by end of tenth year.
2. Research Wilderness use to determine if and how encounters with other visitors within the Wilderness affects the opportunity for solitude and one's Wilderness experience. Needed by end of fifth year.
3. Research methods for rehabilitating areas of impacted resources within Wilderness. Needed by end of fifth year.
4. Investigate the rate at which native vegetation in the alpine community can recover from human impact. Needed by midpoint of first decade.
5. Research impacts of mountain goats on native plants and soil. Needed by end of fifth year.
6. Research air quality within Wilderness. Needed by end of tenth year.
7. Within Wildernesses, obtain data regarding campsite numbers within selected areas, campsite conditions, opportunities for solitude at campsites, and water quality condition of selected lakes and streams. Needed by end of third year.

Fire and Air

1. Investigate methods of refining burning techniques so as to reduce total suspended particulate (TSP) production, thereby facilitating attainment of air quality goals. Needed by the midpoint of the first decade.
2. Verify current method of predicting TSP output (or develop more reliable predictive model). Needed by midpoint of first decade.

Fisheries

1. Develop a model that predicts effects of large organic debris on fish habitat quality. Verify assumptions behind fish habitat capability estimation techniques. Needed prior to Plan revision.
2. Determine actual average annual fisheries outputs associated with each type of habitat improvement project. Needed by midpoint of first decade.
3. Inventory Forest fish habitat to determine quality and quantity. An initial assessment of Forest stream conditions is needed, in order to validate planning assumptions and identify habitat enhancement opportunities. Needed by end of third year.

INFORMATION NEEDS

Wildlife

1. Determine actual home range needs of wildlife indicator species, the northern spotted owl in particular, so that the adequacy of remaining old-growth areas and habitat allocations can be established. Needed by end of third year.
2. Inventory Forest wildlife habitat, including deer and elk winter range, to determine quality and quantity of habitat available. Needed by midpoint of first decade.
3. A value analysis of methods used to create and/or maintain dead and down woody material is needed, in order to establish the most effective means of maintaining habitat for primary cavity excavators. Needed by end of third year.

Soil

1. Establish relationships of soil compaction, slash burning, and removal of surface soil ("A" Horizon) to forest soil productivity and productivity recovery rates through time. Develop means of estimating changes in soil productivity that will result from management activities. Needed prior to Plan revision.
2. Develop and maintain an inventory of all mass wasting and soil erosion areas that are greater than .05 acres. This will aid in identifying potential soil stabilization projects. Needed by midpoint of first decade.

Timber

1. Validate managed timber yield simulators (or develop improved predictive capability). Needed by midpoint of first decade.
2. Determine the feasibility of managing timber under "ecological prescriptions" which will retain substantial volume on the site and attempt to retain or develop old-growth stand characteristics. Needed by mid-point of first decade.
3. A comprehensive inventory of current timber stand conditions (including old-growth), growth rates, and other vegetative condition parameters is needed in order to update stand data and validate planning assumptions. Needed by end of fourth year.

Water/Riparian

1. Verify the model used to make sediment yield predictions in the Forest planning process. A more reliable and less costly means of predicting the effects of forest management activities on sedimentation rates would be desirable. Needed prior to Plan revision.
2. Inventory current status of vegetation within riparian areas. Initial inventory is needed to determine existing conditions and facilitate monitoring of changes in riparian condition. Needed by end of third year.
3. Quantify existing water quality variables in major watersheds. Parameters such as sediment and water temperature should be determined, both upstream from the National Forest boundary and

immediately downstream from the last point of potential effect due to National Forest activity. Needed prior to Plan revision.

Cultural Resources

1. Develop, schedule, and program a complete coverage survey plan that includes survey coverage for all areas not likely to be examined through surveys associated with resource management projects. Establish a comprehensive survey program that will, over time, inventory and evaluate all cultural resources.
2. Track building maintenance, restoration, and rehabilitation costs for historic structures in order to develop better programming and budgeting cost data for these activities. Internal management guidelines have been developed for CCC administrative structures. Cost collection efforts should be made to establish the costs associated with these standards.
3. Investigate and collect information on maintenance, restoration, and rehabilitation of historic structures, i.e. methodologies, sources of building materials and supplies, etc.
4. Develop and document a formal archaeological research survey design strategy for the Olympic National Forest.

Chapter III

Response to Issues, Concerns and Opportunities



Olympic National Forest

Chapter III

RESPONSE TO ISSUES, CONCERNS AND OPPORTUNITIES

INTRODUCTION

This chapter briefly presents the response of the Forest Plan to planning issues developed in the scoping process. An early step in development of this plan was the identification of issues, concerns, and opportunities (ICOs) related to management of the Olympic National Forest. ICOs were identified through citizen participation, including public meetings, interagency coordination, personal contacts with individuals and groups, and comments in response to the DEIS and Proposed Forest Plan. FEIS Appendix A describes the process used to summarize public input regarding the original ICOs. FEIS Chapter I describes how the ICOs have been clarified since publication of the DEIS and Proposed Forest Plan.

The Forest identified 13 ICOs which provided the foundation for developing the range of alternatives presented in the FEIS. Each alternative responds to the ICOs in a different way, generating a different mix of goods and services from the Forest. How well each alternative resolves the ICOs depends on the benefits gained by various Forest users. Complete resolution of all ICOs is not feasible. Because of interrelationships among Forest resources, a gain to one user may be a loss to another. Tradeoffs and compromises are necessary to meet the intent of the Multiple-Use Act of 1960. A discussion of tradeoffs that were considered in analyzing all six alternatives, and in identifying the Preferred Alternative, is provided in FEIS Chapter II.

The Forest Plan is the Preferred Alternative (Alternative C-Preferred (Modified)) of the FEIS; it is the alternative the Regional Forester has determined will be of most benefit to the public. Compromises among the ways individual issues could be resolved were necessary in order to arrive at the mix of resource uses that provides the most balanced approach to satisfying diverse interests and desires. In planning terminology, the Preferred Alternative is the one that comes closest to maximizing long-term net public benefit, which is the value to the nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs). Net public benefit is evaluated using both quantitative and qualitative information and assessments rather than a single measure or index, such as monetary value alone.

The ICOs addressed by this Forest Plan include the following:

1. Management of the Scenic Resource
2. Management of Recreation Resources
3. Old-Growth Forest Management
4. Timber Harvest Schedule and Location

RESPONSE TO ISSUES

5. Transportation System Management
6. Management of Soil, Water, and Riparian Areas
7. Fish and Wildlife Habitat Management
8. Management of Unroaded Areas
9. Management of Potential Wild and Scenic Rivers
10. Management of Native Plant Species and Communities
11. Effects of Forest Management on Local Communities
12. Management of the Shelton Cooperative Sustained Yield Unit (CSYU)
13. American Indian Concerns, Values, and Treaty Rights

The remainder of this chapter will focus on how this Forest Plan addresses each of the above planning questions. For a more detailed discussion of the issues, concerns, and opportunities, and associated planning questions, please refer to Appendix A of the accompanying FEIS. Also see Appendix K of the FEIS, which includes the responses to public comments on the Draft EIS and Plan.

RESPONSE TO ISSUES

1. *How should the scenic resource of the Forest be managed?*

Response

Approximately 14 percent of the Forest is currently classified under the Visual Quality Objective (VQO) of Preservation (where generally only ecological changes alter the landscape), 4 percent is classified as Retention (management activities are not evident), 11 percent is Partial Retention (management activities may be evident but do not dominate the natural landscape), and the remaining 71 percent is classified as either Modification or Maximum Modification (management activities may dominate the natural landscape but should repeat natural occurrences). Acreages in each Visual Quality Objective classification are as follows:

Visual Quality Objective	Total Acres	Percent of Forest
Preservation	89,700	14
Retention	22,600	4
Partial Retention	67,500	11
Modification & Maximum Modification	452,500	71

Under the direction contained in this Plan, the VQOs will generally be met as inventoried. In the management areas outside of A2-Scenic that are programmed for timber harvesting, the Standards and Guidelines (see Plan Chapter IV) specify that VQOs *should* be met unless rationale is displayed

through an environmental analysis which justifies deviation from the inventoried VQO. Within A2-Scenic areas, the VQOs *shall* be met. Use of the A2-Scenic management prescription has been expanded since the Draft Plan to provide greater assurance of protection of visual quality in highly sensitive areas of the Forest.

The Forest has identified twenty viewsheds that involve sensitive landscapes as viewed from high use areas or travel routes. Under current direction, there would be two viewsheds in a Natural Appearing condition, five in a Slightly Altered condition, six in a Moderately Altered condition, and seven in a Heavily Altered condition. Under this Plan, the ultimate mix of viewshed conditions will be seven Natural Appearing viewsheds and thirteen which appear Slightly Altered.

2. How should the outdoor recreation resource be managed?

Response

The Forest currently has 2,285 "persons at one time" (PAOT) capacity for developed camping. Projected demand is for an additional 2,300 PAOT by the end of the first decade (see Chapter II, Table II-3).

The Forest currently provides recreation opportunities in the following Recreation Opportunity Spectrum (ROS) classes: Primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Road-ed Natural, Road-ed Modified (a subclass of Road-ed Natural), and Rural. The Forest has 88,265 acres of Wilderness and approximately 85,800 acres in unroaded areas. Refer to Table II-2 in Chapter II for acreage and projected demand by ROS class. Refer to FEIS Chapter III, Table III-39 for acreage of each unroaded area. Refer to Tables III-35, 36, and 37 in Chapter III of the FEIS for Wilderness information.

Demand for developed camping will be met by expanding existing sites or constructing new sites. Demand for roaded dispersed recreation will be readily met, since the existing and future road access systems provide capacity for this form of recreation that is well in excess of demand. Roaded dispersed recreation opportunities are now available on approximately 76 percent of the Forest. The remaining 24 percent of the Forest currently provides opportunities for unroaded recreation in the Primitive and Semi-Primitive ROS classes.

Currently, the demand for Primitive and Semi-Primitive recreation opportunity exceeds existing RVD capacity. Given this situation, the Forest will be unable to provide the Primitive and Semi-Primitive acreage necessary to meet demand. The quality of Primitive and Semi-Primitive experiences will continue to be impacted by high user densities and management-imposed restrictions aimed at limiting user density. Roughly two-thirds of the existing Primitive and Semi-Primitive recreation opportunity outside Wilderness will be retained in perpetuity under this Plan.

Demand for trail availability will be met by both constructing new trails and reconstructing existing trails. Construction of 52 miles of new trails is planned for the first decade in response to projected demand for nonmotorized trail recreation. A total of 331 miles of potential trail has been identified. New trails will be constructed along these potential locations as needed to meet demand. Trail reconstruction will be carried out as needed to maintain the serviceability of the 227 miles of existing trails. For the first decade, trail reconstruction needs totalling 94 miles are projected.

One aspect of the trail question that is relatively new on the Forest is demand for trails on which ORV use is allowed. The trail mileage needed to provide sufficient opportunities for ORVs will be analyzed, and the Forest will then look for opportunities to meet this demand in areas where resource

impacts and user conflicts can be avoided. Meeting this demand may involve construction of new trails in the first decade specifically to meet ORV needs. Such construction would be in addition to the 52 miles to be constructed for nonmotorized use. Therefore, the projection of 52 miles in the first decade is a minimum, with the potential for more construction being needed to respond to ORV demand.

Trail and recreation facility construction and reconstruction projects for both developed and undeveloped recreation uses are identified in Appendix A of this Plan.

3. *How should the old-growth resource of the Forest be managed?*

Response

The acreage of old-growth allocated to Spotted Owl Habitat Areas (SOHAs) in this Plan has increased as a result of meeting the direction in the Record of Decision for the Supplemental EIS to the Regional Guide.

Of the 266,800 acres of existing old-growth on the Forest, it is estimated that 244,800 acres of old-growth will remain at the end of the first decade and 185,000 acres will remain at the end of the fifth decade.

The Standards and Guidelines have been expanded to include provision for a timber management prescription which retains some old-growth characteristics in some areas after timber harvest (Chapter IV, Management Area E1).

The new inventory of mature and overmature stands now underway should provide more specific information about existing old-growth on the Forest. Also, stands will be evaluated as they are located on the ground during implementation. This information will be used to assess where it may be appropriate to protect old-growth stands for their ecological, wildlife habitat, and amenity values. Locations of Spotted Owl Habitat Areas may also be shifted during plan implementation as appropriate to better meet the needs of the owl and other resource objectives. The acreage of old-growth by Management Area Prescription is presented in Table III-1.

Table III-1. Estimated Acreage of Old-Growth by Management Area Allocations (Thousand Acres) 1/

Management Area Allocation	Total Acreage (Thousand Acres)	Old-Growth Acreage (Thousand Acres)	Percent of Total Old-Growth
A1A - Undeveloped Recreation (Non-Motorized)	34.5	24.5	9.2
A1B - Undeveloped Recreation (Motorized)	6.1	4.1	1.5
A2 - Scenic	38.2	14.8	5.6
A3 - Developed Recreation and Admin. Sites	1.1	0.1	0.0
A4A - Wild and Scenic Rivers	1.8	0.3	0.1
A4B - River Corridors	17.3	8.2	3.1
B1 - Wilderness	88.3	46.8	17.5
C1 - SOHAs	75.7	57.2	21.4
C2 - Pileated & Pine Marten Areas	4.5	3.3	1.2
C3 - Bald Eagle Management Areas	1.1	0.7	0.3
E1 - Timber Management 2/	325.7	94.8	35.5
F1 - Municipal Watersheds	33.2	8.2	3.1
F2 - Riparian Areas 3/	—	—	—
J2 - Research Natural Areas	1.5	1.5	0.6
J3 - Botanical Areas	3.1	2.3	0.9
TOTAL ACRES	632.3	266.8	100

1/ All acreages are mutually exclusive, e.g., A4A, C1, C2, J2, and J3 within Wilderness (B1) are reported only as B1.

2/ Contains some riparian area, some constrained scenic management areas, and some unsuitable timberland. Other areas within E1 may not prove to be cost-effective in meeting the objectives of the Plan.

3/ The 177,050 acres of riparian area are distributed across the Forest and are included in the acreage of the other management areas. Constraints are placed on management of riparian zones to meet riparian area protection objectives.

4. Where should timber be harvested and what is the appropriate harvest level?

Response

Under this Plan, the National Forest area outside of the Shelton CSYU to be planned for final timber harvest in the first decade will average approximately 2140 acres per year, with an estimated average annual volume of 19.0 MMCF (101.6 MMBF) offered for sale. National Forest land within the CSYU will account for an additional 260 acres and 1.6 MMCF (9.3 MMBF) per year. The long-term sustained yield capacity (LTSYC) is 27.9 MMCF/year outside of the CSYU.

The average annual harvest in decade one for each Ranger District is:

Hood Canal *	MMCF (9.5 MMBF)
Quilcene	MMCF (13.6 MMBF)
Quinault	MMCF (48.1 MMBF)
Soleduck	MMCF (30.4 MMBF)
TOTAL	101.6 MMBF

* 9.5 MMBF does not include volume from Shelton CSYU. See Planning Question #12 (Management of Shelton CSYU) for discussion of National Forest harvest from the CSYU.

Appendix A lists the timber sales expected to occur during the next ten years. Probable location, timing, volume, and area are listed for each sale area; however, these may change as site-specific needs are identified through project planning, which includes the environmental assessment (EA) process.

Nonchargeable volume will average an estimated 2.3 MMCF per year. This includes submerchantable timber, salvage, and miscellaneous products. Nonchargeable volume may be removed from lands not designated for timber production but managed to meet special conditions. These conditions are described in Chapter IV, Standards and Guidelines.

Of the 583,800 acres of forested land on the Forest, 446,900 have been determined to be tentatively suitable for timber production. Under the allocations in this Plan, approximately 352,000 acres are suitable for timber management.

5. *How should the existing transportation system be managed, and where should new roads and trails be constructed?*

Response

The Olympic National Forest transportation system is planned, developed, and managed to facilitate accomplishment of the resource management objectives of the Forest Plan. Standards for roads and trails are a direct result of the resource objectives each facility is intended to serve. The costs of construction and maintenance of these facilities are a direct result of the standards used and the operation the facility receives.

This Plan projects that an estimated 415 miles of road construction will be needed over the next 50 years to facilitate implementation of management direction. Approximately 141 miles will be constructed during the next ten-year period, with roughly 28 miles of this construction occurring in currently unroaded areas. Use of permanent road closures as a road system management tool will be increased over the long term, as roughly 34 percent of the system is expected to have some form of permanent closure by the end of the fifth decade (as opposed to 23 percent at present). Seasonal closures will remain at about today's level, or roughly 8 percent of the system.

The current transportation system also includes 227 miles of trail. Approximately 15 percent of the trail system is open to motorized vehicles, 69 percent is open to pack and saddle stock use, and 37 percent is open to mountain bicycles. None of the trails are closed to hikers. The trail management plan includes approximately 331 miles of proposed trail. 303 miles are proposed as non-Wilderness trails and the remaining 28 miles are proposed as Wilderness trails. Approximately 33 percent of the proposed trails are identified to be designed and constructed to accommodate motorized use, and 67 percent are identified to be designed and constructed to accommodate a mixture of nonmotorized uses, such as hikers, pack and saddle stock, and mountain bicycles.

Demand for trail availability will be met by both constructing new trails and reconstructing existing trails. Construction of 52 miles of new trails is planned for the first decade in response to projected demand for nonmotorized trail recreation. Trail reconstruction will be carried out as needed to maintain the serviceability of the 227 miles of existing trails. For the first decade, trail reconstruction needs totalling 94 miles are projected.

One aspect of the trail question that is relatively new on the Forest is demand for trails on which ORV use is allowed. The trail mileage needed to provide sufficient opportunities for ORVs will be analyzed, and the Forest will then look for opportunities to meet this demand in areas where resource

impacts and user conflicts can be avoided. Meeting this demand may involve construction of new trails in the first decade specifically to meet ORV needs. Such construction would be in addition to the 52 miles to be constructed for nonmotorized use.

The trail system will continue to be managed essentially as it is under current direction, but the environment through which most of the existing and proposed trails pass will be more natural appearing than would occur under current direction.

6. How should the soil and water resources (including riparian areas, hydropower potential, and municipal watersheds) be managed?

Response

Protection is provided for soil and water resources by leaving areas of vegetation on slopes with high risk of landslides, and by distributing timber harvest across basins to minimize risk of concentrating effects of logging activities within one drainage.

Implementation of direction in this Plan will result in sediment levels being decreased in the first decade by over 40 percent from current levels. The amount of timber harvest activity in riparian areas will be reduced approximately 25 percent from what is currently occurring. Restrictions on potential hydropower developments will occur on the Gray Wolf, Dungeness, and Duckabush Rivers due to Wild and Scenic River recommendations.

Within municipal watersheds, harvest per decade is limited to 16 percent of the acreage in available harvest-age timber stands in order to protect municipal water supplies. In application, this means that no more than five percent of the total area of any municipal watershed will be harvested in the first decade.

In combination with riparian area, River Corridor, and Wild and Scenic River Standards and Guidelines, the application of site-specific measures or Best Management Practices (BMPs) will serve to meet or exceed State water quality standards.

7. How should fish and wildlife habitat be managed?

Response

The overall quality of habitat for wildlife on the Forest is most closely correlated with the amount of habitat available for individual wildlife indicator species. These species are intended to collectively represent the habitat needs of all wildlife species that inhabit the Forest. The land allocations and management prescriptions included in this Plan are designed to assure that viable populations of all indicator species (and thus all Forest wildlife species) will be maintained. This assurance is obtained in a variety of ways.

In the case of the northern spotted owl, pileated woodpecker, pine marten, and bald eagle indicator species, population viability is maintained by allocating specific land areas to management prescriptions which preclude timber harvest. The spotted owl, woodpecker, and marten habitat allocations form networks of habitat areas of adequate size and spacing to assure population maintenance for each of these species. In the case of the bald eagle, the Forest will provide 16 nesting and roosting sites of approximately 64 acres each, with harvest precluded within these sites. In addition, other activities that may disturb nesting and roosting will be controlled in the vicinity of the sites.

Population viability of the primary cavity excavator indicator species group will be maintained through provisions designed to assure an adequate distribution of snags throughout the Forest. This is to be accomplished by leaving selected snags and green trees (to serve as future snags) within timber harvest units (see "Standards and Guidelines", Chapter IV, for further detail).

Deer and elk habitat and its carrying capacity will not change significantly from current conditions, although moderate declines in Forest populations of both of these indicator species may occur by the end of the fifth decade due to changes in timber age class structure. Population viability of these indicator species is expected to be maintained without specific allocations precluding timber harvest. However, areas within elk and deer winter range which are identified as necessary for big game winter survival will receive special management, as outlined in the Forest-wide Standards and Guidelines (Chapter IV). This management should serve to avoid significant fluctuations in deer and elk populations.

Direction in this Plan is expected to result in an increase in fish production potential of more than ten percent by the end of the first ten-year period of implementation (assuming completion of anticipated habitat enhancement projects). This corresponds to an estimated 1,200,000 additional anadromous smolts. These smolts will contribute an average annual increase (from current fishery production potential) of 174 thousand pounds of commercial anadromous catch. Fishery-related recreation experiences will total more than 29,000 user days per year.

Under this Plan, application of management practices designed to improve anadromous fish habitat will expand. These include providing sources of large woody material, protection of riparian vegetation, improved road building and maintenance techniques, and site-specific structural improvement projects. The structural improvement projects, which are designed to enhance the basic productive capacity of the Forest's fish habitat, could increase production potential by as much as ten percent during the initial decade of Plan implementation. This accounts for a substantial proportion of the total projected increase in habitat productivity.

Table III-2 displays, by major Forest drainage, the estimated first-decade productive potential of the Forest's fish habitat that is expected to result from Plan implementation. Potential production levels of anadromous smolts, anadromous commercial catch, and anadromous and resident recreation use are compared to the current estimated production potential (1988 stream conditions) for these outputs. In the case of anadromous outputs, the production potential associated with full implementation of anticipated anadromous habitat enhancement projects is also shown. It should be noted that these estimates reflect *potential* production, and are based on the assumption that available habitat will be fully utilized. Actual level of utilization depends on many factors beyond the control of the Forest, and has not been projected.

**Table III-2. Estimated Potential Annual Fishery Outputs
(On-Forest Habitat Only)**

Anadromous Recreation (WFUDs)

		Estimated Forest Plan Potential	
Drainage	Current Potential	Without Enhancement	With Enhancement
East Straits	79	72.5	79.8
Dungeness	2,196	2,294.4	2,523.8
Little Quilcene	0	0.0	0.0
Big Quilcene	570	613.5	674.9
Dosewallips	3,177	3,173.8	3,491.2
Duckabush	1,519	1,525.2	1,677.7
Hamma Hamma	543	621.4	683.5
Hood Canal	0	0.0	0.0
Skokomish	2,229	2,851.1	3,136.2
Satsop	181	213.5	234.9
Wynoochee	1,408	1,416.0	1,557.6
Humptulips/ Wishkah	506	551.7	606.9
Quinalt/Raft	553	561.4	617.5
Queets	598	675.7	743.3
Hoh/Bogachiel	30	30.2	33.2
Calawah/Sitkum	1,294	1,306.6	1,437.3
Soleduck	1,115	1,175.8	1,293.4
West Straits	286	292.8	322.1
TOTAL	16,284	17,375.6	19,113.3

Anadromous Commercial Catch (1000 lbs)

		Estimated Forest Plan Potential	
Drainage	Current Potential	Without Enhancement	With Enhancement
East Straits	7.7	7.4	8.1
Dungeness	167.9	175.4	192.9
Little Quilcene	0.0	0.0	0.0
Big Quilcene	30.2	32.3	35.5
Dosewallips	263.4	263.1	289.4
Duckabush	129.4	130.0	143.0
Hamma Hamma	16.2	18.7	20.6
Hood Canal	0.0	0.0	0.0
Skokomish	96.1	123.4	135.7
Satsop	10.9	13.1	14.4
Wynoochee	89.9	90.2	99.2
Humptulips/ Wishkah	32.3	35.4	38.9
Quinalt/Raft	71.5	72.5	79.8
Queets	32.8	36.8	40.5
Hoh/Bogachiel	0.4	0.4	0.4
Calawah/Sitkum	80.4	81.5	89.7
Soleduck	78.1	82.3	90.5
West Straits	14.8	15.7	17.3
TOTAL	1,122.0	1,178.2	1,295.9

Resident Recreation (WFUDs)

Drainage	Current Potential	Estimated Forest Plan Potential
East Straits	244	262.3
Dungeness	189	199.8
Little Quilcene	162	154.2
Big Quilcene	767	829.1
Dosewallips	48	40.5
Duckabush	411	330.5
Hamma Hamma	1,365	1,508.9
Hood Canal	186	147.2
Skokomish	1,400	1,947.0
Satsop	704	1,132.1
Wynoochee	476	628.3
Humptulips/ Wishkah	980	1,129.4
Quinault/Raft	412	470.5
Queets	359	453.9
Hoh/Bogachiel	40	42.5
Calawah/Sitkum	561	550.6
Soleduck	472	520.1
West Straits	1,509	1,482.2
TOTAL	10,285	11,829.1

Smolt Production (1000 smolts)

		Estimated Forest Plan Potential	
Drainage	Current Potential	Without Enhancement	With Enhancement
East Straits	97.2	91.7	100.9
Dungeness	2,381.8	2,490.4	2,739.4
Little Quilcene	0.0	0.0	0.0
Big Quilcene	105.4	113.4	124.7
Dosewallips	3,614.2	3,609.1	3,970.0
Duckabush	1,672.1	1,679.2	1,847.1
Hamma Hamma	25.8	29.5	32.5
Hood Canal	0.0	0.0	0.0
Skokomish	202.2	258.4	284.2
Satsop	27.8	32.9	36.2
Wynoochee	235.1	236.6	260.3
Humptulips/ Wishkah	105.3	114.4	125.8
Quinault/Raft	298.3	302.4	332.6
Queets	93.1	105.1	115.6
Hoh/Bogachiel	1.8	1.8	1.8
Calawah/Sitkum	191.1	193.2	212.5
Soleduck	272.0	286.3	314.9
West Straits	88.3	90.1	99.1
TOTAL	9,411.5	9,634.5	10,597.6

8. How should the unroaded areas of the Forest be managed?

Response

Currently, there are approximately 85,800 acres within 13 unroaded areas on the Forest. Most of these are adjacent to the five Wildernesses and/or Olympic National Park. Refer to FEIS Chapter III, Table III-39, for current acreage by unroaded area.

Under management direction contained in this Plan, approximately 57,500 acres of the existing 85,800 acres of unroaded areas will remain unroaded. These unroaded areas, combined with the Wildernesses and the Quinault Research Natural Area, will retain approximately 23 percent of the Forest in an unroaded condition.

Of the 57,500 acres of unroaded area to be retained, 41,900 acres will fall in the Primitive or Semi-Primitive ROS classes. Primitive and Semi-Primitive recreation opportunities will be retained in portions of 11 unroaded areas and in all of two unroaded areas. A total of 35,225 acres in unroaded areas are allocated to Management Area A1A-Undeveloped Recreation (Nonmotorized), while 6,138 acres will be in Management Area A1B-Undeveloped Recreation (Motorized). In addition to allocations to Undeveloped Recreation prescriptions, portions of existing unroaded areas are included in SOHAs and other allocations which prohibit timber harvest, and will thus remain unroaded.

Additional information may be found in Chapter IV of this Plan and Appendix C of the FEIS.

9. How should the corridors adjacent to potential Wild and Scenic Rivers be managed?

Response

This Plan recommends that three rivers, the Dungeness, Gray Wolf, and Duckabush, be designated as part of the Wild and Scenic River System. The lands within these river corridors will be managed to retain their wild and scenic values (Management Prescription A4A). Four other eligible rivers are proposed for suitability analysis and recommendation by the National Park Service, as their corridors have only minor acreages on National Forest land. These are the Quinault, Hoh, Bogachiel, and Elwha Rivers.

Rivers that meet Wild and Scenic River eligibility criteria, but are not recommended for designation, will be managed as River Corridors (Management Prescription A4B). A total of 14 rivers are assigned this management prescription. This includes the four rivers recommended for analysis by the National Park Service.

Additional management direction may be found in Chapter IV of this Plan, and further detailed information is in FEIS Appendix F, Wild and Scenic Rivers.

10. How should the Forest's native plant species and communities be managed?

Response

This Plan provides for the protection of several areas containing native plant communities. Included are 12 Botanical Areas totalling 6,320 acres. Of this total, 3,095 acres are within Wilderness, and 1,372 acres are within other allocations which prohibit timber harvest, such as Undeveloped Recreation (A1A Management Prescription). These Botanical Areas are designed to protect an array of

native plant species, ranging from large old western redcedar and Alaskan yellow cedar through fragile alpine wildflowers. Standards and Guidelines for Botanical Areas are found under Management Prescription J3.

One additional Research Natural Area (J2 Management Prescription) recommendation is made for the Wet Weather Creek site, which is located entirely within the Buckhorn Wilderness. This area will be managed to maintain its potential research values. The existing Quinault RNA will continue to be managed under its current management plan.

The Standards and Guidelines are designed to protect other sensitive plant species during project design and implementation.

11. *How will management of Forest Resources affect local communities?*

Response

During the first 10 years of Plan implementation, Forest outputs will generate an estimated 5,500 jobs/year in the four counties in which the Forest is located. This estimate is based on current employment coefficients for Forest outputs, and does not incorporate possible changes in labor productivity. The estimated employment associated with this Plan is 84 percent of the employment that has been supported by Forest outputs over the last 9 years. The projected decrease in jobs is due to timber harvest levels expected to be 22.5 percent lower than the average harvest level of 380 MMBF between 1980 and 1988.

While the reduced timber harvest level is expected to result in employment decreases, these will be mitigated to some extent by increased employment in the recreation and commercial fishing sectors. Increases in recreation use and fishery outputs are projected to generate approximately 350 new jobs (including commercial fishing employment associated with improved off-Forest fish habitat conditions). These jobs will offset roughly 30 percent of the timber-related employment change. The net employment change in the first decade is estimated to be a reduction of approximately 800 person-years of employment per year.

During the first decade, an average of \$4.5 million/year (in 1982 dollars) should be distributed to the four counties for school and road programs from the sale of National Forest timber. This is 17 percent less than the average of \$5.4 million/year that was paid between fiscal years 1985 and 1989. Payments are expected to decrease primarily because volume of timber harvest is expected to decline.

12. *How should the Shelton Cooperative Sustained Yield Unit (Shelton CSYU) be managed?*

Response

National Forest lands within the Shelton CSYU are managed and administered by the Hood Canal Ranger District. Timber harvest activity within the CSYU has shifted from National Forest land to Simpson Timber Company land. Under this Plan, the area planned for timber harvest from National Forest lands in the next decade will average approximately 260 acres per year, with an estimated average annual volume of 9.3 MMBF (1.6 MMCF) offered for sale to Simpson Timber Company. Total annual yield from the CSYU, which includes harvest volume from Simpson Timber Company lands, will be approximately 192.7 MMBF (41.2 MMCF).

This Plan incorporates the requirements of the National Forest Management Act (NFMA) on all National Forest lands within the Shelton CSYU. Implementation of this Plan does not require changes in the existing Cooperative Agreement governing the management of the CSYU, and none are proposed (see Chapter IV of this Plan for further management direction regarding the Shelton CSYU).

13. How will American Indian concerns, values, and treaty rights be addressed by this Plan?

Response

In response to extensive dialogue with the American Indian community, comments received at meetings, and written public responses, the planning documents have been substantially strengthened to more adequately address the concerns of American Indians. This Plan ensures that treaty rights and fundamental opportunities relating to religious, ceremonial, and traditional concerns will be protected and preserved. The Plan recognizes these treaty and statutory rights and values, and acknowledges that they have an important place in American Indian culture. The Plan also recognizes the importance of ancestral sites, uses of Forest resources, and the value placed on western redcedar and salmon resources.

During Plan implementation, the Forest will continue to coordinate with the American Indian community, ensuring that concerns regarding protection of ancestral sites and freedom to continue traditional religious uses of Forest land and resources are resolved.

Other concerns of the tribes regarding protection of fish, wildlife, and other resources have been addressed in the Plan through appropriate management area allocations and Standards and Guidelines. For example, the River Corridor prescription has been applied to fourteen rivers, and the Wild and Scenic River prescription has been applied to three rivers. These allocations will provide substantial protection for anadromous fisheries, and help resolve a major tribal concern. The numerous allocations to the Botanical Area prescription will provide protection of areas utilized by Peninsula tribes for traditional purposes, including plant gathering (when this is not in conflict with Botanical Area objectives).

Chapter IV

Forest Management Direction



Olympic National Forest

Chapter IV

FOREST MANAGEMENT DIRECTION

INTRODUCTION

This chapter presents the management goals, objectives, standards, and guidelines that provide direction for resource management covered by this Plan. Included in this chapter are:

FOREST MANAGEMENT GOALS established in the planning process to aid in developing the Plan, and to provide for multiple use and other goals of management.

DESIRED FUTURE CONDITION OF THE FOREST which describes what the Forest should look like 10 years and 50 years into the future, after management direction contained in this Plan has been implemented.

FOREST MANAGEMENT OBJECTIVES which display the levels of goods and services anticipated as the Plan and projected budgets are implemented. A narrative summary of resource outputs and schedules is provided.

FOREST-WIDE STANDARDS AND GUIDELINES which state the parameters or constraints within which management practices will be carried out to achieve management objectives.

MANAGEMENT AREA PRESCRIPTIONS which contain a description of each management prescription and management area, and the standards and guidelines applicable to each management area.

FOREST MANAGEMENT GOALS

Forest management goals are statements that describe the future condition this Plan is designed to achieve. They are expressed in general terms, are usually not quantified, and are timeless in that they have no specific date by which they are meant to be completed.

Forest planning goals are derived from public issues and management concerns. Where appropriate, these goals are also linked to the direction given in the Regional Guide. It is the intent of the Plan to achieve the following multiple use goals.

GOALS FOR COORDINATION WITH OTHER AGENCIES AND THE PUBLIC

In carrying out its basic multiple-use mission, the Forest will cooperate with other government agencies, organizations, and individuals having an interest in National Forest management. Special emphasis will be

FOREST MANAGEMENT GOALS

given to coordinating management activities with Peninsula Indian tribes, Olympic National Park, Washington State Departments of Natural Resources, Wildlife, and Fisheries, U.S. Fish and Wildlife Service, and county and local governments. In partnership with these and other agencies, the Forest will assist in providing sound forest management leadership throughout the Olympic Peninsula area.

GOALS FOR RESOURCE PROGRAMS

SCENERY

1. Manage sensitive viewsheds in such a manner that their landscape character and scenic qualities are maintained or enhanced.
2. Manage other resources in areas outside of viewsheds in such a manner that visual quality objectives are met. When visual quality objectives will not be met, activities will be planned and designed to minimize visual impacts upon the landscape.
3. Manage viewsheds where the Existing Visual Condition is not compatible with the Visual Quality Objectives by implementing management activities aimed at rehabilitating existing visual impacts.

RECREATION

1. Provide a range of recreation opportunities across the Recreation Opportunity Spectrum (ROS) except for the Urban class. Opportunities will be compatible with resource capabilities and responsive to public needs and expectations.
2. Manage a network of system trails that involves a range of trail management objectives and user opportunities. Assure that barrier-free trail opportunities are available.
3. Encourage and foster new and unique opportunities to develop partnerships and cooperative ventures with other agencies, user groups, and private enterprises that will enhance recreation opportunities and resource management.
4. Provide an informational program that will: (a) provide accurate, courteous public service in all management activities, (b) assist the public in planning safe activities and enjoyable experiences; and (c) provide the public with information and opportunities that will assist them in gaining a better understanding of individual resources and their management.
5. Provide safe and well-maintained facilities at developed recreation sites that offer a range of opportunities and experiences. Assure that facilities are readily accessible to a diverse public, including the physically impaired.
6. Provide a range of undeveloped recreation opportunities aimed at maximizing user satisfaction while minimizing user conflicts, overcrowding, and the need for law enforcement intervention.
7. Provide interpretive facilities and programs that will: (a) assist resource managers in implementing and accomplishing resource management objectives, (b) help visitors increase their awareness and understanding of resource management practices, (c) increase the visitor's understanding of and

orientation to the Forest's resources and features, and (d) provide opportunities for enhancement of the visitor's recreation experience.

8. In conjunction with recreation tract expiration dates, Forest Service policy, and the Lake Quinault South Shore Composite Plan, conduct periodic reviews of "highest and best use" determinations for land occupied by recreation residences. Review will be from the perspective of the values, opportunities, and benefits represented by limited, single-family recreation residence use versus the broader spectrum of opportunities that may be needed to meet future public needs and desires.

WILDERNESS

1. Manage Wildernesses in accordance with the Wilderness Act of 1964.
2. Follow a nondegradation policy that recognizes that a variety of natural and social settings can be found in Wilderness. The primary intention of this policy is to ensure that existing settings do not fall below their present condition simply to accommodate more use. In some cases, management actions will be necessary to restore areas to acceptable conditions.
3. Provide a range of recreational opportunities within the Wilderness Resource Spectrum (WRS) that is compatible with resource capabilities.
4. Utilize the Limits of Acceptable Change process as a management tool to prevent unacceptable impacts or changes within Wilderness.

WILDLIFE HABITAT

1. Emphasize contacts with Olympic Peninsula Indian tribes and Federal and State agencies to provide for coordinated wildlife habitat management.
2. Manage wildlife habitat to maintain (at a minimum) viable populations of all existing native vertebrates (36 CFR 219.19).
3. Maintain and improve habitat for management indicator species (36 CFR 219.12).
4. Provide for and maintain diversity of plant and animal communities to meet overall multiple use objectives (36 CFR 219.26).

FISH HABITAT

1. Emphasize contacts with Olympic Peninsula Indian tribes and Federal and State agencies to provide for coordinated fish habitat management.

FOREST MANAGEMENT GOALS

2. Maintain and improve fish habitat for indicator species groups (i.e., anadromous and resident fish).

RANGE

If requested, provide for livestock grazing at a level commensurate with other resource needs.

VEGETATION

1. Enhance the growth, utilization, and salvage of wood and wood products to help meet the region's short- and long-term needs.
2. Continue to produce timber outputs on suitable Forest lands consistent with other resource values and cost-efficiency.
3. Provide for management of sufficient old-growth to meet resource needs, including habitat for old-growth dependent species such as the northern spotted owl.
4. Provide fuelwood collection opportunities and uses of other miscellaneous forest products (such as mushrooms, berries, and plants) to the extent that it does not jeopardize resource values.
5. Protect communities of native plant species.

SOIL, WATER AND AIR

1. Protect, conserve, and enhance the long-term productivity of forest soils for the multiple uses of the Forest.
2. Provide for water quality needs for municipal and domestic water supply.
3. Protect rivers, streams, shorelines, lakes, wetlands, flood plains, and other riparian areas during implementation of management activities.
4. In cooperation with other Federal, State, and local agencies, provide air quality that meets or exceeds Federal regulations and State standards.

MINERALS AND ENERGY

1. Maintain a program that accommodates exploration, development, and utilization of mineral and energy resources. The program should provide for development in balance with environmental values and other resource management objectives. Maintain dialogue with mining and energy interest groups to seek opportunities in mining and energy development which serve changing public needs.
2. Assess and evaluate the potential for mineral and energy resources such as hydropower, geothermal, wood (biomass), wind, coal, oil, and gas.

RESEARCH NATURAL AREAS (RNAs)

1. Provide for continued research and educational opportunities in natural ecosystems.
2. Recommend establishment of additional RNAs for recognized needs of the RNA Program.

HUMAN AND COMMUNITY DEVELOPMENT

1. Emphasize human resource and equal opportunity programs and the opportunities they provide to help implement Forest resource and support programs.
2. Develop an active, positive program of volunteers for the Forest.

CULTURAL RESOURCES

1. Inventory and evaluate all known and existing cultural resources. Complete nominations for all known properties that are eligible for the National Register of Historic Places.
2. In cooperation with others, especially the Olympic National Park, continue to build a data base to establish and refine contexts for cultural resource properties. Manage cultural resources cooperatively whenever appropriate.
3. In concert with the Office of Archaeology and Historic Preservation, continue to integrate the cultural resource management program and the land-use decisionmaking process with the State of Washington Resource Protection Planning Process.
4. Develop cooperative and mutually beneficial partnerships with local historical societies, museums, schools, and others for development of interpretive programs and projects that will provide public appreciation and enjoyment of cultural resources.

AMERICAN INDIANS

1. Promote understanding and awareness by managers and employees at all levels of the rights, concerns, and culture of American Indians. Foster stable working relationships with tribal contacts at all organizational levels. Assure that American Indians are well-represented in the Forest Service work force at all levels.
2. Accomplish regular contact, communication, and program management coordination between District Rangers and the tribal leaders within their respective zones of influence.
3. Working in conjunction with Peninsula Indian tribes, sponsor local events and activities that foster awareness and appreciation of American Indian culture.
4. Endeavor to fully redeem treaty responsibilities and obligations in all aspects of land and resource management.

FOREST MANAGEMENT GOALS

LANDS

1. Complete priority land exchange, acquisition, and disposal cases identified in the Land Adjustment Plan to facilitate accomplishment of resource management objectives identified in the Forest Plan.
2. Post all Olympic National Forest property lines and monument all corners.
3. Assure effective and efficient resolution of situations involving illegal or non-conforming uses of National Forest land.
4. Complete road and trail transportation planning for all National Forest land that may require access over private land. Acquire rights-of-way needed for National Forest management purposes.
5. Issue potable water system component authorizations only for improvements that contribute, or will contribute, to public utility system development. In consultation with County Health Departments, avoid single-use water system development in favor of systems that benefit the general public and promote formation of utility districts.
6. When practical, limit new utility and transportation corridor development to existing routes to avoid proliferation of impacts and fragmented maintenance responsibilities. Take advantage of opportunities to use transportation and utility corridors for compatible purposes, such as bicycle paths, cross-country skiing routes, wildlife habitat, and production of miscellaneous forest products.
7. Accept applications for new special use permit authorizations only if applicant has provided completed plans, environmental studies, and supporting documentation that would justify issuance of a permit. Use collection agreements in order to cover the cost of processing and issuing permits. Inspect and administer permits through self-inspection programs and processes.

GOALS FOR SUPPORT PROGRAMS

FOREST PROTECTION

1. Protect life, property, and Forest resources from wildfire.
2. Protect Forest resources from insect or disease epidemics.
3. Prevent or reduce serious long-lasting hazards from pest organisms under the principles of integrated pest management (IPM).
4. Plan prescribed burning to minimize smoke intrusion into sensitive areas and maintain air quality at a level that conforms to Federal regulations and State standards.
5. Where appropriate, use prescribed fire as a management tool to improve resource production, including increasing wildlife habitat quality and forage potential.

FACILITIES

1. As they are needed, provide and maintain capital investments such as buildings, utility systems, roads, trails, fences, and bridges.
2. Provide for efficient construction, operation, and maintenance of transportation facilities on the Forest.
3. Maintain facilities for the safety, enjoyment, and well-being of the intended user.
4. Work closely with various interest groups and individuals to consider common road and trail objectives and resolve potential conflicts.

SOCIO-ECONOMIC

1. Contribute to the viability of local community economies.
2. Assist resource dependent communities in identifying needs and opportunities relating to economic and social changes, and aid such communities in developing the resources needed to prepare for and manage their futures.
3. Contribute to the satisfaction of local, regional, and national demands for goods and services available from the Forest.
4. Contribute to the well-being of Peninsula Indian tribes through partnerships in land management, employment, cultural programs, and treaty-related issues.

COST-EFFICIENCY

Strive for cost-efficiency in the accomplishment of resource management objectives.

FOREST MANAGEMENT OBJECTIVES

The National Forest Management Act (NFMA) regulations define an objective as "a concise, time-specific statement of measurable planned results that respond to pre-established goals." Objectives reflect mixes of outputs or achievements which can be obtained at a given budget level within a stated time period. Objectives are the annual resource outputs that serve to accomplish goals of this Forest Plan.

Goods and services to be provided by this Plan are summarized in Table IV-1. This table also indicates the funding level necessary to meet these planned outputs. If final budgets are different than those shown in Table IV-1, then outputs will vary according to the final funding levels. Data presented are for average annual outputs for the first five decades.

FOREST MANAGEMENT OBJECTIVES

A narrative description of the resources (outputs) follows Table IV-1.

PROJECTED OUTPUTS

Outputs shown in Table IV-1 represent average annual outputs expected during Plan implementation for the first five decades. Actual outputs may vary up or down from year to year within a decade, but should average to the figures shown over the full decade.

Table IV-1. Resource Output Summaries

Output	NAS Codes	Unit Measure	Decade 1	Decade 2	Decade 3	Decade 4	Decade 5
Recreation							
Developed Recreation Use	AN122	1,000 RVDs	411.1	447.6	488.7	517.3	599.9
Developed Camping Capacity	AN122	1,000 PAOTs	4.6	5.0	5.5	6.1	6.7
Non-Wilderness Undeveloped Recreation Use							
Roaded	AN122-1	1,000 RVDs	917.3	1,002.6	1,102.7	1,176.2	1,374.4
Unroaded	AN122-1	1,000 RVDs	32.4	36.6	40.6	44.7	49.1
Wilderness Use	AW1	1,000 RVDs	97.3	104.7	114.3	120.9	140.2
Construction							
Developed Sites	AN22	PAOT	230.0	40.0	50.0	60.0	58.0
Trails	AT22	Miles	5.2	3.1	3.4	3.8	4.2
Reconstruction							
Developed Sites	AN22	PAOT	95.0	80.0	56.0	56.0	56.0
Trails	AT22	Miles	9.4	5.7	4.0	3.0	3.0
Maintenance Trails	AT23	Miles	227	279	310	344	382
Visual Quality Objectives							
Preservation	AV112	Acres	89,733	89,733	89,733	89,733	89,733
Retention	AV112	Acres	22,600	22,600	22,600	22,600	22,600
Partial Retention	AV112	Acres	67,500	67,500	67,500	67,500	67,500
Unroaded Areas Assigned to Unroaded Management	NA	Acres	57,500	57,500	57,500	57,500	57,500
Wild & Scenic Rivers Proposed	AN12	Number	3	3	3	3	3
	AN12	Miles	30	30	30	30	30
River Corridors	NA	Number	14	14	14	14	14
	NA	Miles	116.5	116.5	116.5	116.5	116.5

FOREST MANAGEMENT OBJECTIVES

Output	NAS Codes	Unit Measure	Decade 1	Decade 2	Decade 3	Decade 4	Decade 5
Wildlife and Fish							
Wildlife Use	CW1	1,000 WFUDs	50.9	48.2	45.9	41.9	41.8
Fisheries Use	CW1	1,000 WFUDs	29.2	28.6	28.5	27.8	29.4
Anadromous Fish							
Commercial Harvest	CA1	1,000 lbs. Fish	1,178	1,165	1,165	1,139	1,178
Habitat Improvement	CA2	1,000 lbs. Fish	118	232	232	228	237
Management Indicator Species							
Spotted Owl	CW1	Number of Pairs	83	76	70	64	63
Pileated Woodpecker	CW1	Number of Pairs	814	741	680	625	614
Marten	CW1	Number of Pairs	1,525	1,389	1,276	1,171	1,151
Primary Cavity Excavators	CA1	Percent of Potential Population	70	67	66	64	64
Black-Tailed Deer	CW1	Number	6,423	6,125	5,773	5,180	5,179
Roosevelt Elk	CW1	Number	3,031	2,829	2,769	2,624	2,619
Bald Eagle	CW1	Number of Pairs	756	720	688	659	643
Wildlife Habitat Improvement	CW221	Structures	442	442	442	442	442
	CW222	Acres	715	715	715	715	715
TE&S Habitat Improvement	CT221	Structures	7	7	7	7	7
	CT222	Acres	800	800	800	800	800
Anadromous Fish Habitat	CF221	Structures	302	302	302	302	302
	CF222	Acres	17	17	17	17	17
Inland Fish Habitat Improvement	CI221	Structures	34	34	34	34	34
	CI222	Acres	8	8	8	8	8
Old-growth Forest (Midpoint of Decade)	ET11	Acres	256,000	234,000	214,000	196,000	187,000
Range - Permitted Use	DN1	1,000 AUMs	0.2	0.2	0.2	0.2	0.2

FOREST MANAGEMENT OBJECTIVES

Output	NAS Codes	Unit Measure	Decade 1	Decade 2	Decade 3	Decade 4	Decade 5
Timber							
Suitable Lands	ET251	1,000 Acres	352.1	352.1	352.1	352.1	352.1
Acres Clearcut	ET11	1,000 Acres	2.4	3.0	3.1	4.1	2.4
Acres Commercial Thinning	ET11	1,000 Acres	0.6	0	0.1	0.1	0.3
Timber Offered - Allowable Sale Quantity							
National Forest Outside CSYU	ET11	MMCF MMBF	19.0 101.6	20.6	24.0	25.7	25.7
National Forest Within CSYU	ET11	MMCF MMBF	1.6 9.3	3.1	4.2	10.9	2.5
Total National Forest	ET11	MMCF MMBF	20.6 110.9	23.7	28.2	36.6	28.2
Simpson Timber Company	NA	MMCF MMBF	39.6 183.4	38.1	37.1	30.4	43.7
Total - all lands	ET11	MMCF MMBF	60.2 294.3	61.8	65.3	67.0	71.9
Fuelwood	ET12	MCF	690	760	680	510	290
Long-Term Sustained Yield Total							
National Forest	NA	MMCF	35.9	35.9	35.9	35.9	35.9
Timber Growth in 2030	NA	MMCF					34.0
Reforestation							
Total National Forest	ET24	Acres	2,412	3,045	3,118	4,091	2,354
Simpson Timber Company	NA	Acres	5,497	4,871	4,218	3,105	4,503
Timber Stand Improvement							
Total National Forest	ET25	Acres	3,502	3,434	1,809	2,284	2,338
Simpson Timber Company	NA	Acres	1,124	1,966	5,497	4,871	4,218
Water							
Yield	FW1	1,000 Acre Feet	5,933	5,934	5,934	5,936	5,933
Sediment	FW1	Tons	114,600	131,000	133,900	161,500	118,400
Improved Watershed Condition	FW22	Acres	445	410	400	390	260
Riparian Area							
Harvested	NA	Acres	614	776	794	1,042	600
Percent of Total	NA	Percent	0.3	0.4	0.4	0.6	0.3
Energy							
Woody Residues	NA	1,000 Tons	72.6	91.7	93.3	85.4	70.9
Energy Potential	NA	Billion BTUs	587.9	739.4	752.3	688.6	570.1
Research Natural Areas	NA	Number	2	2	2	2	2
	NA	Acres	2,600	2,600	2,600	2,600	2,600
Botanical Areas	NA	Number	12	12	12	12	12
	NA	Acres	6,320	6,320	6,320	6,320	6,320

FOREST MANAGEMENT OBJECTIVES

Output	NAS Codes	Unit Measure	Decade 1	Decade 2	Decade 3	Decade 4	Decade 5
Minerals							
Area Withdrawn	GM1	1,000 Acres	105.5	105.5	105.5	105.5	105.5
Restrictions on Mineral Activity							
High	GM1	1,000 Acres	108.9	108.9	108.9	108.9	108.9
Moderate	GM1	1,000 Acres	36.0	36.0	36.0	36.0	36.0
Low	GM1	1,000 Acres	381.9	381.9	381.9	381.9	381.9
Common Variety Mineral Used	GM	1,000 Cubic Yards	51	50	50	50	50
Fire Management							
Effectiveness Index	PF1	\$/1,000 Acres	1,856	2,171	2,112	2,052	1,993
Fuel Treatment	PF2	Protected Acres	893	1,127	1,154	1,514	871
Road System							
Arterial and Collector Roads							
Construction	LT222	Miles	1.0	1.0	0.0	0.0	0.0
Reconstruction	LT223	Miles	2.0	2.0	2.0	2.0	2.0
Timber Purchaser Roads							
Construction	LT222	Miles	13.1	11.1	8.0	5.9	1.4
Reconstruction	LT223	Miles	11.7	12.3	12.7	13.0	13.0
Road Construction in Undeveloped Areas	LT222	Miles	2.8	2.1	1.4	0.7	0.0
Road Inventory Suitable for Public Use							
Passenger Car	LT23	Miles	717	689	677	671	665
High Clearance Vehicle	LT23	Miles	1,281	1,300	1,319	1,329	1,338
Road Inventory Open/Closed							
Road Mileage Open	LT23	Miles	1,998	1,989	1,996	2,000	2,003
Road Mileage Closed	LT23	Miles	737	867	940	995	1,006
Economic and Social Variables 1/							
Operational Costs	NA	Million \$	9.0	9.6	10.2	11.6	10.3
Capital Investment Costs	NA	Million \$	6.7	7.5	8.0	9.3	7.3
Total Forest Budget							
Allocated	NA	Million \$	0.1	0.1	0.1	0.2	0.2
Appropriated	NA	Million \$	15.6	17.0	18.1	20.7	17.4
Return to Government	NA	Million \$	2.2	5.7	10.4	14.4	5.0
Payments to Counties	NA	Million \$	4.5	5.7	7.2	8.8	5.6
Changes in Income	NA	Million \$	-17.0	-	-	-	-
Changes in Jobs	NA	Total	-800	-	-	-	-
Human Resource Program	HS	Person Years	14	16	16	16	16

1/ Monetary values in 1982 dollars.

RESOURCE SUMMARIES

This section provides a summary of general management direction governing land uses, activities, and output levels associated with each of the Forest's principal resources under the provisions of this Plan. Projections of anticipated levels of outputs and effects are also provided. More detailed management direction is included later, in the "Standards and Guidelines" section of this chapter, as well as in management plans covering individual resources or programs (such as the Olympic National Forest Trail Plan). See Chapter V for a complete listing of these plans, which are on file at the Forest Supervisor's office.

WATER QUALITY

Municipal Watersheds

There are 9 municipal watersheds on the Olympic National Forest, ranging in average daily use from 4,000 gallons per day to 5.5 million. To be classified as a municipal watershed, a water supply source must meet one of the following criteria: (1) at least 25 individuals are served at least 60 days per year, or (2) at least 15 service connections are provided.

Four of the Forest's municipal watersheds, the Dungeness, Big Quilcene, Little Quilcene, and Wishkah Rivers, serve major Peninsula cities. The water supply for the city of Sequim is derived from infiltration galleries adjacent to the Dungeness River. The Big Quilcene is the primary water source for the city of Port Townsend, with the Little Quilcene used periodically as a backup system. A letter of intent from the USDA Forest Service establishes cooperation with the city in regard to activities within both of these drainages. The Wishkah River serves the city of Aberdeen. A Memorandum of Understanding between the USDA Forest Service and the city establishes policies for protecting the water quality of this water supply system.

Direction for management of municipal watersheds is provided in the "Standards and Guidelines" section of this chapter. The primary goal is to provide high quality water by minimizing soil erosion and the introduction of chemicals or bacteria. Activities in these watersheds will be somewhat restricted. Examples are:

1. Overnight camping is prohibited in the Wishkah watershed.
2. Herbicides and pesticides should not be used in municipal watersheds, except as needed to control roadside vegetation.

Provisions contained in Forest-wide standards and guidelines and the watershed management prescription are designed to assure continued high-quality water in these areas.

Sediment

Sediment is the water quality parameter most often changed by management activities. The cumulative effect of sediment from nonpoint sources can cause reductions in water quality and result in lowered fish habitat productivity. Because of the significance of sediment, and the desirability of minimizing sediment levels, many provisions and limitations regarding soil disturbance and erosion control are included as standard features of project design criteria. Specific direction regarding such requirements is detailed in Forest-wide standards and guidelines, and throughout the management prescriptions detailed later in this chapter.

In addition to standards and guidelines covering the conduct of project-related activities, there are several provisions of this Plan which will serve to reduce sediment output. These provisions are: Best Management Practices (FEIS Appendix J), mitigation and enhancement measures common to all alternatives (FEIS Chapter II), the Management Requirement attainment strategies applicable to riparian areas, and increased road closures. Road closures will be a primary tool for reducing sediment from areas where traffic is a prime contributor in wet weather. The anticipated effect of the combination of allocations, activities, and standards and guidelines specified in this Plan is an overall reduction in sedimentation. Expected sediment indices are displayed in Table IV-2. The current index of sediment output above natural levels is approximately 192,000 tons per year.

**Table IV-2. Projected Sediment Indices
(Average Annual Output, in Tons)**

Decade	Sediment Index
1st	114,600
2nd	131,000
3rd	133,900
4th	161,500
5th	118,400

Other Water Quality Parameters

Most streams on the Forest have water temperatures near or below optimum levels for aquatic organisms. Therefore, stream temperature concerns are normally minimal. Streams on the east side of the Olympic Peninsula have steep gradients and are fast-flowing, with little opportunity for solar radiation to heat the water. Streams on the west side have low gradients in the broad, flat lands off-Forest. Water temperature increase could be of concern in these areas, for example, in the case of a hot summer combined with low stream flow.

Bacteriological and chemical water quality of streams on the Peninsula has historically been very good. Low counts of coliform bacteria and dissolved chemical constituents have been found in periodic water samples collected by the U.S. Geological Survey over the past 20 years. In the last decade, however, the number of cases of Giardiasis, a waterborne disease, has shown a marked increase. This has not been attributed to Forest management activities.

It is anticipated that activities associated with this Plan will not reduce the chemical and bacteriological quality of Peninsula streams, nor will they affect water temperature regimes to any measurable extent. Projects having the potential of introducing undesirable bacteria or chemicals into streams are governed by standards and guidelines designed to minimize this potential.

FOREST MANAGEMENT OBJECTIVES

TIMBER HARVEST AND MANAGEMENT

Suitability

Table IV-3 displays the stratification of suitability for timber production applicable to the Olympic National Forest under the provisions of this Plan.

Table IV-3. Timberland Classification

Classification	Acres
1. Non-forested land (includes water)	48,535
2. Forest land	583,789
3. Forest land legislatively withdrawn from timber production	68,055
4. Forest land physically unsuitable: --irreversible damage likely to occur	27,761
--not restockable within 5 years	41,034
5. Tentatively suitable forest land (Item 2 minus Items 3 and 4)	446,939
6. Forest land not allocated to timber production in this Plan: --Reserved for other resource uses	27,340
--Needed to meet Management Requirements	67,490
7. Unsuitable forest land (Items 3, 4, and 6)	231,680
8. Total suitable forest land (Item 2 minus Item 7)	352,109
9. Total National Forest land (Items 1 and 2)	632,324

Productivity

An approximation of timber productivity for the Forest is shown in Table IV-4. Information in the table correlates to an average productivity for the Forest of 124.5 cubic feet per acre per year, assuming intensive timber management.

Table IV-4. Timber Productivity Classification of Suitable Lands

Potential Growth (Cubic Feet/Acre/Year)	Suitable Lands (Acres)
Less than 20	0
56	53,800
76	8,000
110	137,500
142	19,200
158	96,000
190	37,600
TOTAL	352,100

Silvicultural Treatments

Forest stands managed to produce wood fiber (timber) are treated in different ways to improve timber growth rates. These treatments, known as silvicultural treatments, are scheduled at various times in a forest's life cycle. Timing depends on factors such as stand age, productivity class, tree species, and cost versus benefit.

Table IV-5 displays the average annual acreage of each silvicultural treatment likely to be scheduled on suitable forest land in the first decade of this Plan. See Appendix G in the FEIS for additional information on the selection of harvest cutting method.

Table IV-5. Silvicultural Treatments
(Average Annual Acreage in First Decade, by Ownership)

Practice	National Forest Land	Simpson Timber Company Land
Harvest:		
Regeneration (clearcut)	2,412	5,497
Intermediate (commercial thinning)	564	0
Timber Stand Improvement (thinning)	3,450	1,124
Reforestation (natural and artificial)	2,412	5,497
Fertilization	490	4,843

Timber Sale Program Quantity

The timber sale program quantity includes the total amount of wood fiber programmed (funded) to be sold in a fiscal year. It consists of the allowable sale quantity (ASQ) plus additional volume incidental to that quantity. These volumes are displayed in Table IV-6.

In this Plan, the ASQ from suitable National Forest land is 19.0 million cubic feet (101.6 million board feet) from areas outside the Shelton CSYU, and 1.6 MMCF (9.3 MMBF) from National Forest land within the CSYU. In addition, it is expected that an additional 2.3 million cubic feet (12.4 million board feet) of down, defective, or substandard material will be removed. This includes 0.2 million cubic feet from National Forest land within the Shelton CSYU. Therefore, the total expected annual timber sale program quantity from all suitable National Forest lands is 22.9 million cubic feet, or 123.3 million board feet. ASQ from Simpson Timber Company land within the Shelton CSYU is expected to average 39.6 MMCF (183.4 MMBF) per year, with an additional 4.4 MMCF (20.4 MMBF) per year of incidental material.

FOREST MANAGEMENT OBJECTIVES

**Table IV-6. Allowable Sale Quantity and Timber Sale Program Quantity
(Annual Average for First Decade)**

Harvest Method	Sawtimber ^{1/}	Other Products ^{1/}
Eastside and Westside Zones		
Allowable Sale Quantity ^{2/}		
Regeneration harvest (clearcut)	17.7	0
Intermediate harvest (commercial thinning)	1.3	0
Total ASQ	19.0	0
Additional Sales ^{3/}	0	2.1
Timber Sale Program Quantity	19.0 (101.6 MMBF)	2.1 (11.3 MMBF)
Shelton CSYU Zone (National Forest)		
Allowable Sale Quantity		
Regeneration harvest (clearcut)	1.6	0
Intermediate harvest (commercial thinning)	0	0
Total ASQ	1.6	0
Additional Sales ^{3/}	0	0.2
Timber Sale Program Quantity	1.6 (9.3 MMBF)	0.2 (1.1 MMBF)
Shelton CSYU Zone (Simpson Timber Co.)		
Allowable Sale Quantity		
Regeneration harvest (clearcut)	39.6	0
Intermediate harvest (commercial thinning)	0	0
Total ASQ	39.6	0
Additional Sales ^{3/}	0	4.4
Timber Sale Program Quantity	39.6 (183.4 MMBF)	4.4 (20.4 MMBF)

^{1/} Volumes in million cubic feet.

^{2/} Includes only chargeable volume from suitable land.

^{3/} Includes only nonchargeable volume from suitable or unsuitable land.

Relationship of Allowable Sale Quantity to Long-Term Sustained Yield Capacity

Based on calculations made in the planning process, the allowable sale quantity (ASQ) for the Eastside and Westside zones is expected to be lower than long-term sustained yield capacity (LTSYC) in the early decades on suitable forest land. Calculations made for the Shelton CSYU indicate that ASQ in the early decades will also be lower than LTSYC. See Table IV-7 for these relationships.

Table IV-7. Relationship of ASQ to LTSYC

	Decade	ASQ (MCF)	LTSYC (MCF)
Eastside and Westside Zones	1	19,005	27,941
	2	20,594	27,941
	3	24,046	27,941
	4	25,672	27,941
	5	25,672	27,941
	6	25,672	27,941
Shelton CSYU	1	41,283	62,066
	2	41,283	62,066
	3	41,283	62,066
	4	41,283	62,066
	5	46,184	62,066
	6	62,066	62,066

Present and Future Forest Conditions

The current and expected future age class distribution of trees on suitable forest land is displayed in Table IV-8. Information in the table provides an indication of expected age and size class diversity of the future forest.

Table IV-8. Age Class Distribution (Acres)

Age Class	Present Forest	Future Forest ^{1/}
10	46,300	29,600
20	47,700	36,600
30	45,800	35,900
40	40,000	31,200
50	2,000	41,200
60	0	35,000
70	500	36,300
80	13,500	36,000
90	8,500	32,500
100	9,100	3,000
110-150	35,700	20,500
160+	103,500	14,700
TOTAL	352,100	352,100

^{1/} Future forest in 150 years based on FORPLAN calculations.

OLD-GROWTH

Several management areas are allocated to uses which assure that the old-growth forest within them will be reserved from timber harvest. Examples of these are areas where Primitive and Semi-Primitive recre-

FOREST MANAGEMENT OBJECTIVES

ation opportunities are to be retained. Land delineations designed specifically to provide old-growth habitat (such as Management Areas C1 and C3) will assure maintenance of additional old-growth forest. Management guidelines for riparian areas, and attainment of Retention and Partial Retention Visual Quality Objectives, will also contribute to the total availability of old-growth forest. Specific direction regarding such requirements is detailed in Forest-wide standards and guidelines and throughout the management prescriptions (especially C1 and C3) detailed later in this chapter.

At present, there are about 266,800 acres of old-growth on the Forest. This represents about 42 percent of the total Forest area, and about 46 percent of forested land. Of the 266,800 acres of old-growth, approximately 170,000 acres (64 percent) are considered to be tentatively suitable for timber production. The remaining 96,800 acres are in areas classified as unsuitable for timber production (including Wilderness) in all alternatives, and are expected to remain as old-growth throughout the planning horizon.

Of the tentatively suitable acreage currently classified as old-growth, approximately 68,500 acres are allocated to uses which preclude programmed timber harvest. The remaining 101,500 acres are included in the timber harvest base. Old-growth on these acres will diminish as timber harvest proceeds. It is estimated that 81,800 acres will be harvested by the end of the fifth decade. The projected availability of old-growth forest at the end of each of the first five decades is displayed in Table IV-9. These figures vary from those in Table IV-1, since those in IV-1 reflect *average annual* outputs. The old-growth remaining at the midpoint of each decade is used to best represent these average annual figures. Table IV-9 reports old-growth remaining at the *end* of each decade. Note that these projections are estimates only, and that actual acreage will depend on the on-the-ground implementation of the timber harvest program.

Table IV-9. Projected Old-growth (Acres)

Decade	Cumulative Old-growth Harvested	Total Remaining at End of Period
Present		266,800
1st	21,900	244,900
2nd	43,800	223,000
3rd	62,000	204,800
4th	78,700	188,100
5th	81,800	185,000

RIPARIAN AREAS

Riparian areas are to be managed so as to protect, maintain, or improve their unique values as they relate to wildlife and fish habitat and water quality. Activities within riparian areas are to result in a diversity of vegetative communities of various species, sizes, and age classes through time so as to continuously provide the following conditions:

1. A vegetative pattern within streamside zones capable of maintaining stream channel and bank structure sufficient to maintain water quality in Class I, II, and III streams at or above existing levels;
2. A source of both present and future supplies of natural woody debris adequate to maintain fish habitat at or above existing levels (in general, most large, woody debris entering a stream comes from the zone within 100 feet of the channel); and

3. A pattern of diverse and well-distributed wildlife habitat types.

Specific direction regarding requirements for riparian management is described in Forest-wide standards and guidelines and throughout management prescriptions (especially F2) detailed later in this chapter.

Riparian areas will also be managed for timber production, where this is compatible with the above management goals and other resource objectives of this Plan. Forest-wide, riparian areas contain approximately 98,600 acres of timberland classified as suitable for timber production. Under the land allocations and timber harvest objectives specified in this Plan, it is estimated that roughly 13,900 acres, or about 14 percent, will be harvested within riparian areas in the first 20 years. When timber harvesting activities do occur in riparian areas, it will be primarily along Class III and IV streams. It is expected that this level of harvest will be compatible with Plan objectives for providing desired riparian vegetative conditions.

WILDLIFE HABITAT

Several allocations have been made for the specific purpose of perpetually providing adequate availability of suitable habitat for key wildlife species. The goal of these allocations is to provide for the maintenance of sufficient habitat to assure viable populations of indicator species dependent upon old-growth and mature forest habitat types. These allocations represent the means of meeting Management Requirements for wildlife habitat maintenance developed for this Plan, and are as follows:

- 30 spotted owl habitat areas (SOHAs) averaging 3000 acres each
- 16 bald eagle nest sites and wintering areas (6 of which are partially included in owl, pileated woodpecker, or marten areas)
- Four 300-acre pileated woodpecker areas (an additional 52 are included in SOHAs)
- Twenty-two 160-acre pine marten areas (an additional 133 are included in SOHAs and pileated woodpecker areas).

Approximate locations of spotted owl, pileated woodpecker, and marten habitat areas are displayed on the maps accompanying this document.

Current information indicates that these habitat allocations will be sufficient to assure maintenance of viable populations of wildlife indicator species dependent on old-growth and mature forest habitat. Timber harvest is precluded within these habitat areas, as are other management activities which would compromise habitat integrity. Specific direction regarding such requirements is described in the Forest-wide standards and guidelines, and throughout the management prescriptions (especially C1, C2, and C3) detailed later in this chapter. Additional old-growth and mature forest habitat will be maintained in other allocations which preclude or limit timber harvest.

The Columbian black-tailed deer and Roosevelt elk also serve as indicator species, representing wildlife associations which require a mix of vegetative age classes. While no specific land allocations are made in this Plan to assure maintenance of elk and deer habitat, it is expected that vegetative patterns which result from Plan implementation will provide an acceptable mix of habitat conditions. Elk and deer populations are expected to remain quite stable throughout the early decades of the planning horizon. By the fifth decade, the conversion of substantial acreages of existing forest to younger age classes as timber harvest progresses may result in a moderate decline in elk and deer populations as tree canopies close and available forage decreases.

The relative condition of elk and deer habitat can be measured in terms of the Wildlife and Fish User Days (WFUDs) of recreation projected to be available as a result of big game population levels. Such estimates are linked directly to elk and deer populations, as these are the principal species receiving consumptive

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recreation use (primarily hunting) on the Olympic National Forest. At present, approximately 49,950 wildlife-related WFUDs are produced each year by Forest habitat. It is estimated that Plan implementation will result in little change in this output over the next 20 years--50,900 WFUDs per year are anticipated in the first decade, 48,200 in the second. An output of 41,800 WFUDs per year is projected for the fifth decade.

In addition to the means of meeting Management Requirements for indicator species habitat, there are several specific provisions of this Plan designed to provide for maintenance or enhancement of overall habitat quality. These include:

1. Emphasis on habitat quality in the management of riparian areas.
2. Implementation of wildlife habitat improvement projects specified in Appendix A of this Plan.
3. Continued use of seasonal road closures during critical periods in order to reduce wildlife disturbance.

FISH HABITAT

Among the allocations designed to provide for or protect fish habitat are the Wild and Scenic River (A4A), River Corridor (A4B), and Riparian (F2) Management Areas. Standards and guidelines provide additional measures of protection. The primary goal of management is to maintain fish habitat at, as a minimum, its existing level of productivity. Beyond this, the objective is to manage habitat so as to promote the highest level of productivity that can be achieved in a cost-efficient manner.

Two principal factors affect fish habitat quality: the availability of large organic debris and the level of sedimentation. Management prescribed for riparian areas in this Plan is, in part, designed to assure a continuous source of large organic debris, thereby providing a sufficient supply of this habitat component. Standards and guidelines covering techniques for road design, construction, reconstruction, and maintenance, as well as guidelines for harvest within riparian areas, serve the purpose of holding sediment output rates within acceptable limits. These provisions, in combination with the overall allocation and management activity patterns included in this Plan, are projected to provide a level of fish habitat quality somewhat above that which currently exists.

Fish habitat quality is to be maintained or improved through implementation of habitat improvement projects outlined in Appendix A of this Plan. These projects, if carried out on an annual basis through the next five decades, have the potential to increase habitat productivity by 20 percent. First decade increases are expected to be approximately 10 percent, as it will take some time for the full effects of the enhancement program to be felt. It is expected that this program of regular habitat improvements will be extended beyond the first decade, as continuous application is necessary if long-term benefits are to be fully realized.

The fishery-related outputs expected to result from implementation of this Plan are displayed in Table IV-10. Note that these are estimates only, and that actual results could vary from anticipated levels. One key factor influencing output levels is escapement. If the number of adult anadromous fish returning to spawn is insufficient to fully seed available habitat, the resultant fisheries outputs will not fully reflect habitat capability. The output projections in Table IV-10 are based on the assumption that escapement will be adequate.

Projected outputs are shown for unenhanced (i.e. habitat improvement projects not included) habitat conditions. Commercial anadromous catch is expressed in thousands of pounds of fish, and sport fishery outputs are displayed as thousands of WFUDs of recreation. Numbers of anadromous smolts (in thousands) which can be produced by expected unenhanced habitat conditions are also shown. Outputs presented are those associated with on-Forest habitat only.

**Table IV-10. Projected Fishery Outputs
(Average Annual Production in Thousands)**

Decade	Smolt (number)	Commercial Catch (lbs)	Recreation (WFUDs)
1st	9,635	1,178	29.2
2nd	9,581	1,165	28.6
5th	9,683	1,178	29.4
AVERAGE--1st-5th	9,603	1,165	28.7

AIR QUALITY

The principal Forest activity affecting air quality is the use of prescribed fire in the treatment of timber harvest residues. In order to limit the effects of burning on the quality of air within populated zones and other sensitive areas, prescribed fire is to be used only when predicted weather conditions (wind patterns in particular) are such that air quality in these areas can be maintained. Specific direction regarding these requirements is described in Forest-wide standards and guidelines and throughout the management prescriptions detailed later in this chapter.

Concern regarding the effect of prescribed fire on air quality has increased considerably in recent years. As a result of this growing interest, the Washington State Implementation Plan (required by Clean Air Act Amendments of 1977) contains a proposed objective of reducing emissions from prescribed fire to no more than 65 percent of the 1976-1979 level by 1990. Attainment of this objective can necessitate use of treatment methods other than burning. Increased utilization of what is now referred to as residues is the preferred method of disposing of excess residues.

Table IV-11 displays the tonnage of total suspended particulates (TSP) expected to result from disposal of residue by burning. These projections are based on the assumption that the current practice of removing substantial proportions of total residue for uses such as fuelwood and pulp material will continue into the future. Under the proposed objectives of the Washington State Implementation Plan, the Forest's limit on TSP output would be 3,837 tons per year in 1990. This is considerably above the level expected to occur under the above assumption.

Table IV-11. Projected Total Suspended Particulates (TSP)

Decade	TSP (Tons/yr.)
1st	1,654
2nd	2,086
5th	1,613

RECREATION

The Olympic National Forest will continue to provide a range of recreation activities and opportunities. The Olympic's recreation program will emphasize: (a) opportunities to implement the National Recreation Strategy, (b) development and maintenance of high quality developed recreation sites, and (c) a wide variety of undeveloped recreation opportunities in a range of outdoor settings.

National Recreation Strategy

The Forest will strengthen existing partnerships, and develop new ones, aimed at providing customer satisfaction through high-quality services and improved facilities. Partnerships with other agencies, recreation user groups, and private enterprise will be sought to strengthen the Olympic's recreation program.

Developed Sites

The Forest's developed site program will continue to provide readily accessible and appropriately designed and maintained facilities for people seeking a convenient recreation experience. Major emphasis will be placed on:

1. Maintaining existing sites to a high standard. Maintenance will focus on providing facilities and settings that are consistent with management objectives while providing for the needs and safety of the visitor.
2. Reconstructing or replacing substandard sites and facilities. Sites with high visitor use will receive highest priority. Other rehabilitation priorities are: (a) resolve safety problems, (b) resolve sanitation problems, (c) resolve potable water problems, (d) protect resources, (e) protect investments, and (f) resolve user conflicts. Sites inventoried for reconstruction within the period covered by this Plan are listed in Appendix A.
3. Selecting materials and facilities based on the latest technology, management objectives, Forest experience, and user preferences.
4. Meeting demand for developed camping capacity. See Table IV-12 for the capacity needed to meet projected demand for developed campgrounds. Demand will be met by:
 - (a) Expanding existing sites having high use and adequate space for expansion. Priorities are the same as in number 2 above. Sites inventoried for expansion within the period covered by this Plan are listed in Appendix A.
 - (b) Constructing new sites where public demand exists, high quality opportunities are present, and resource management objectives are compatible. Sites inventoried for expansion within the period covered by this Plan are listed in Appendix A.

Table IV-12. Projected Demand for Developed Site Capacity

		PAOT Demand per Decade (Ms)				
	Existing Capacity	1	2	3	4	5
Capacity (PAOT)	2.3	4.6	5.0	5.5	6.1	6.7

5. Implementing management direction for recreation residences and the Lake Quinault Resort as directed in the Lake Quinault South Shore Composite Plan. Any increase in proposed development will be analyzed in terms of recreation opportunities, recreation user demand, public service, and consistency with management direction.

Undeveloped Recreation

The Forest will continue to provide a variety of undeveloped activities and opportunities. Management of dispersed recreation areas and the construction of facilities to support dispersed recreation activities will be consistent with the Recreation Opportunity Spectrum class of each area. Management will place major emphasis on:

1. Providing a variety of opportunities for both dispersed motorized and dispersed nonmotorized recreation. The Forest will begin to develop facilities and provide opportunities to accommodate the expected increases in off-road vehicle use and snow-play activities. Dispersed opportunities inventoried for development within the period covered by this Plan are listed in Appendix A.
2. Minimizing conflicts among recreation users.
3. Providing opportunities for ORV use which do not result in significant resource damage or lead to conflicts with other trail users. Currently, approximately 15 percent (35 miles) of the existing trails are open to ORV use. Only "street legal" ORVs are allowed on Forest Service roads. ORVs are limited to roads and trails, where they are legally allowed, due to steep terrain and dense vegetation. The Forest has identified approximately 110 miles of potential ORV trail. Actual trail mileages and locations will be based on the Olympic Peninsula Off-Road Vehicle Management Study, demand for ORV trails, and individual project analyses.
4. Providing a trail system that meets demand while providing for a variety of recreation user groups. See Table IV-13 for the trail mileages needed to meet projected demand. Opportunities for both multiple-use and single-use trails within the various ROS classes will be considered. There are approximately 227 miles of existing trail on the Forest, and 331 miles of potential trail location have been identified. Priorities for the Olympic's trail system will focus on maintenance needs, upgrading substandard trails, and constructing new trails in response to management objectives, use levels, available funding, and public input. A major emphasis will be to increase trail mileage outside of Wilderness. Trails and trailheads inventoried for construction or reconstruction within the period covered by this Plan are listed in Appendix A. Refer to FEIS Chapter III, Tables III-28 through III-32, for additional trail information.

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Table IV-13. Projected Demand for Trails

		Demand for Trail Miles by Decade				
	Existing Miles	1	2	3	4	5
Miles of Trail	227	279	310	344	382	424

5. Developing educational and informational programs and techniques to encourage visitors to protect resources, minimize user impacts and conflicts, and become more involved with National Forest management. Interpretive facilities and programs will be developed to help accomplish management goals, and to provide visitors with information that will ensure an enjoyable and safe visit to the Forest.
6. Managing a road system that will provide for a wide range of undeveloped recreation activities and opportunities. Management will continue to recognize driving for pleasure as a major activity on Forest roads. Recreation management objectives will be given emphasis in road design, location, and maintenance.
7. Using timber management activities to both develop new dispersed recreation opportunities and enhance existing facilities and opportunities.

SCENERY

The Forest will continue to implement the USDA Forest Service Visual Management System, with emphasis on maintaining the natural or near natural character of the landscape within specific viewsheds (Management Area A2-Scenic). Landscapes visible from key recreation travel routes and use areas will involve management practices and techniques that will meet the Visual Quality Objectives of Retention and Partial Retention. Management of landscapes outside of scenic viewsheds will be aimed at meeting Visual Quality Objectives, unless this is determined to be incompatible with other resource management objectives.

It is intended that viewshed implementation schedules will be prepared for each viewshed. These schedules will provide management direction and prescriptions aimed at maintaining and/or enhancing the scenic quality within each viewshed. These schedules will be prepared by an interdisciplinary team that includes a landscape architect and a silviculturist.

Implementation of the Forest Plan will produce subtle changes in the appearance of many of the Forest's viewsheds. The existing and expected visual conditions of each viewshed are shown in Table IV-14. The future conditions shown represent expected long-term results rather than immediate changes.

Table IV-14. Viewshed Visual Condition

Viewshed	Acres	Visual Quality Objectives ^{1/}	Existing Condition ^{2/}	Future Condition ^{2/}
Hoodsport Highway 101	1,977	R & PR	NA	SA
Dosewallips Road	6,065	R & PR	MA	SA
Jupiter Ridge Trail	1,319	R	HA	NA
Duckabush Road	1,591	R & PR	NA	NA
Hamma Hamma Road	6,135	R & PR	NA	NA
Lena Lake Trail	697	R	NA	NA
Big Creek Road	2,661	R & PR	MA	SA
Lake Cushman Road	7,581	R & PR	SA	NA
Quilcene Highway 101	6,449	R & PR	SA	SA
Mt. Walker	3,508	R & PR	HA	NA
Quinault Highway 101	6,373	R & PR	NA	SA
North Shore Road	1,769	PR	SA	SA
South Shore Road	6,494	R & PR	NA	NA
Modlips Highway	400	PR	NA	SA
S. Fork Skokomish Road	3,296	PR	SA	SA
Wynoochee	5,792	PR	MA	SA
Soleduck Highway 101	25,288	R & PR	SA	SA
Soleduck Park Road	2,053	R & PR	SA	SA
Elwha Park Road	183	R	NA	SA
Hoh Road	454	R	NA	SA
TOTAL	90,085			

^{1/} R = Retention, PR = Partial Retention

^{2/} NA = Natural Appearance, SA = Slightly Altered Appearance, MA = Moderately Altered Appearance, HA = Heavily Altered Appearance

The Visual Management System is to be used in the development of resource programs and activities to maintain high levels of scenic quality where specified. Application of the System is expected to provide high quality results when landscape architectural design concepts and visual resource management principles are applied. Integration of visual concerns into project management is necessary to retain or enhance scenic quality. National Forest Landscape Management Handbooks are available as guides, and should be consulted. A few viewshed schedules have been developed to provide specific direction for management of the scenic resource. Additional viewshed schedules will be completed during this planning period.

WILDERNESS

Wilderness management will continue to focus attention on preserving and protecting the primeval character and the opportunities for solitude, challenge, risk, and inspiration in each of the Olympic's five Wildernesses. Major emphasis will be placed on:

1. Implementing a nondegradation policy aimed at maintaining each Wilderness in at least as wild a condition as it was at the time of Wilderness classification. The intent is to assure that appropriate diversity and Wilderness character are maintained. It is also intended that the Pristine areas of the Wildernesses not be changed to a lesser standard of naturalness simply to disperse users and accommodate more use.
2. Preparing implementation schedules for each Wilderness.
3. Implementing the Limits of Acceptable Change process, monitoring the results, and initiating preventive or rehabilitative measures when limits are about to be exceeded.

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- Continuing educational and informational programs and activities to encourage Wilderness users to: (a) support the Limits of Acceptable Change program, (b) practice minimum impact techniques, and (c) participate as volunteers in Wilderness management.

The Forest's five Wildernesses are:

Wilderness	District	Total Acres	Primitive Acres	Semi-Primitive Acres
Buckhorn	Quilcene	44,258	26,502	17,756
Colonel Bob	Quinault	11,961	7,037	4,924
Mt. Skokomish	Hood Canal	13,015	7,434	5,581
The Brothers	Hood Canal	16,682	10,059	6,623
Wonder Mountain	Hood Canal	2,349	1,414	935
TOTAL		88,265	52,446	35,819

WILD AND SCENIC RIVERS

River corridors for which specific management direction is prescribed in this Plan fall into three distinct categories:

- Corridors for which Congressional designation as Wild and Scenic River is recommended in this Plan;
- Corridors eligible for classification as Wild and Scenic River, but for which the Forest Service is not the logical lead study agency; and
- Corridors for which classification as Wild and Scenic River is not recommended in this Plan, but which are to be managed to provide protection for many of the corridor characteristics.

Specific direction regarding requirements for management of each of the above categories is described in management prescriptions A4A and A4B, detailed later in this chapter.

The first of the above categories includes three river corridors: the Duckabush, Dungeness, and Gray Wolf River systems. These corridors are recommended for inclusion in the Wild and Scenic River System, and are to be managed to retain characteristics that qualify them for such designation. The segment of the Dungeness River to be recommended runs from the Forest boundary upstream to its confluence with the Gray Wolf River. The Duckabush is to be managed as a Wild River within The Brothers Wilderness, and as a Scenic River from the Wilderness boundary to the Forest boundary. It meets the criteria for a Recreational River designation in the segment from the Forest boundary to the mouth. The Gray Wolf River is to be managed as a Wild River within Buckhorn Wilderness. The Gray Wolf downstream from Road 2927, and the eligible section of the Dungeness downstream from the mouth of the Gray Wolf, are to be managed as Scenic Rivers.

The second category includes four river corridors which are eligible for Wild and Scenic River status, but which lie predominantly within Olympic National Park and contain relatively small acreages managed by the Olympic National Forest. The National Park Service is considered to be the logical lead agency

in conducting classification studies regarding these corridors. The Quinault, Hoh, Elwha, and Bogachiel Rivers fall into this category. The National Forest portions of these river corridors are to be managed to retain the features qualifying them for consideration as Wild, Scenic, or Recreational Rivers until classification studies have been conducted and recommendations made. For the purposes of allocations in this Plan, they are River Corridors (Management Prescription A4B).

The third category includes ten river corridors: the main stem and West Fork of the Humptulips, main stem and South Fork of the Skokomish, Dosewallips, Hamma Hamma, Wynoochee, East Fork Humptulips, Soleduck, Sam's, Calawah and its three forks, and Big Quilcene Rivers. These corridors will be managed to meet a variety of objectives, and will be managed with a range of intensities as specified in the Standards and Guidelines contained in this chapter.

The management direction for the Forest's rivers is summarized in Table IV-15. Please refer to the map overlay which accompanies this Plan for a detailed display of allocations associated with each river segment.

Table IV-15. River Allocations

	Miles	Acres
Wild and Scenic River Recommendations		
Wild Rivers (A4AW)	18.1	6,600
Scenic Rivers (A4AS)	11.9	3,700
River Corridor Allocations		
Minimum Management	9.3	1,200
Natural Management	53.4	10,300
General Management	53.8	11,600

UNROADED AREAS

As a result of the land allocations made in this Plan involving the thirteen unroaded areas, two areas (McDonald and Moonlight Dome) will retain their entire acreages in an unroaded condition. The Moonlight Dome area is allocated to undeveloped recreation, and the McDonald area is allocated to spotted owl habitat management. In the remaining eleven unroaded areas, portions of each area (ranging from 10 percent to 80 percent) are programmed for timber harvesting. Some of the parts of these areas that remain unroaded do so because of high timber management costs. Such areas may or may not provide additional recreation opportunities. Of the current 85,800 unroaded area acres, approximately 57,500 (67 percent) will remain unroaded.

Table IV-16 lists the individual unroaded areas, their current acreages, and the acreage to be retained in an unroaded state.

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Table IV-16. Current and Future Unroaded Acreages by Area

Unroaded Area	Current Acreage ^{1/}	Unroaded Acreage Retained ^{1/}	Allocation ^{2/}
McDonald	500	500	C1
Quilcene	19,000	14,200	A1A A4A F1 C1
Mt. Zion	5,400	3,600	A1B C1 E1
Green Mountain	4,500	700	A2 C1 F1
Jupiter Ridge	8,300	4,500	A1A A2 A4A C1 E1
Jefferson Ridge	9,400	4,300	A1A A2 C1 E1
Lightning Peak	7,200	5,400	A1A A2 C1 E1
Upper Skokomish	6,200	5,000	A1A C1 E1
Moonlight Dome	5,900	5,900	A1A
S. Quinault Ridge	9,800	7,400	A1A A2 J2 C1
Rugged Ridge	4,600	2,500	C1 E1
Mt. Baldy	3,900	2,500	A1B A2 C1
Madison Creek	1,100	1,000	C1 E1
TOTAL	85,800	57,500	

^{1/} Acres have been rounded off.

^{2/} Portions of the unroaded area are allocated to these management prescriptions:

- A1A - Undeveloped Recreation Non-Motorized
- A1B - Undeveloped Recreation Motorized
- A2 - Scenic
- A4A - Wild and Scenic River
- C1 - Spotted Owl Habitat
- E1 - Timber Production
- F1 - Municipal Watershed
- J2 - Research Natural Area

ROADS

The development, maintenance, and management of the Forest development road system is to be continued as needed to respond to resource management objectives. The majority of road-related activities will occur in support of the timber management program, with additional projects undertaken to facilitate recreational use, Forest administration, and resource protection. The primary objective of road development and management is to establish and maintain a cost-effective road system that serves management objectives efficiently while protecting environmental quality. Direction detailing development, management, and environmental protection requirements for the Forest road system are described in Forest-wide standards and guidelines and throughout the management prescriptions detailed later in this chapter.

Management of the Forest development road system is documented in the Road Management Objectives developed for each system road. These objectives, which are available for review at the Forest Supervisor's Office, establish the operation and maintenance standards necessary to serve resource management objectives and access needs. Road Management Objectives presently reflect the resource objectives of current direction. In the case of many roads, these objectives will not change materially under this Plan. Where necessary, Road Management Objectives will be modified to reflect the road management needs associated with implementation of the Forest Plan.

Direction for the maintenance of each Forest development road is documented in its Road Management Objectives. The purpose of road maintenance is to provide resource protection, safe access to users (where use is planned), and protection of the road investment. All roads receive basic custodial maintenance to insure adequate drainage. Closed roads may have drainage structures removed and waterbars or crossditches installed to reduce erosion. Roads remaining open to traffic

receive the degree of maintenance dictated by amount and type of planned use, available funding, and maintenance priorities.

The Forest's current road closure program is also documented in the Road Management Objectives. There are two principal components of this program: seasonal closures and long-term closures. Seasonal closures are used during critical periods to prevent harassment of wildlife and to avoid damage to roads and adjacent resources. The proportion of the Forest's road system managed with long-term closures has increased significantly in recent years, especially within the Shelton Cooperative Sustained Yield Unit. This is done to reduce maintenance costs, improve wildlife habitat conditions, and reduce siltation rates.

Road closures may be accomplished either by blocking the road entrance to all traffic, or by gating as authorized in 36 CFR 261. In the case of gated closures, limited administrative traffic and use related to timber sales, contracts, or permits may be allowed. The current maintenance and road closure status of the Forest development road system is as follows:

Maintained for Passenger Car Use - 29 percent of system
 Open Continuously - 27 percent of system
 Seasonally Closed (gated) - 2 percent of system
Maintained for High Clearance Vehicle Use - 48 percent of system
 Open Continuously - 42.5 percent of system
 Seasonally Closed (gated) - 5.5 percent of system
Gated Closure (Long-Term) - 6 percent of system
Blocked to All Traffic - 17 percent of system

During periods of timber haul, some of the roads maintained for high clearance vehicles may be restricted to logging use alone in order to provide for public safety.

The Forest development road system currently consists of 2,594 miles of system road, of which 190 miles are arterials, 570 miles are collectors, and 1,834 miles are local roads. Estimates of new construction mileage that will be needed to meet Forest Plan objectives are displayed in Table IV-17. Note that these projections are estimates only, and that actual mileage constructed will depend on the results of individual project analyses and designs. With the exception of 15 to 20 miles of minor collectors to be built in the first two decades, newly constructed roads will be classified as local.

Table IV-17. Projected Road Construction (Miles per decade)

Decade	Forest-wide Construction	Construction within Currently Undeveloped Areas
1st	141	28
2nd	121	21
3rd	80	14
4th	59	7
5th	14	0
TOTAL	415	70

The pattern of road use management is expected to change gradually over the next 50 years, as fewer roads are maintained for passenger car use and more roads are closed to all use. Estimated mileage and proportion of the total road system within each road management category at the end of the first and fifth decades are shown in Table IV-18. These estimates are based on the following expectations:

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1. Continued gradual reduction of the average maintenance level of Forest development roads.
2. A lower average maintenance level for new roads (predominantly local) than for the existing system.
3. Increased use of both seasonal and long-term closures.

Table IV-18. Projected Road Use Management

Decade	Passenger Car: Full Use		Passenger Car: Seasonal		High Clearance Vehicle: Full Use		High Clearance Vehicle: Seasonal		Gated Closure		Blocked to All Use	
	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent
Current	697	27	46	2	1,104	42	145	6	160	6	442	17
1st	670	24	47	2	1,123	41	158	6	202	7	535	20
5th	615	20	50	2	1,157	38	181	6	289	10	717	24

MINERALS

Land allocations and management prescriptions detailed in this Plan entail varying degrees of restrictions and limitations on mineral development. For example, prescriptions that require complete withdrawal of lands from mineral entry (i.e., Wilderness and Wild Rivers) are most restrictive. Such withdrawals usually preclude mineral entry, and mineral activities will generally be allowed only on mining claims, leases, or permits having valid existing rights established prior to withdrawal. Prescriptions considered to be highly restrictive toward mineral entry include those covering Scenic or Recreational River designations, Primitive and Semi-Primitive recreation allocations, developed recreation sites, and other areas in which protection of particular environmental values is specified. From a mineral entry standpoint, the least restrictive management areas are those allocated to timber management. With the exception of withdrawn areas, mineral activity is generally not restricted beyond reasonable precautions associated with the protection of resource values.

In areas other than those specifically withdrawn from mineral entry, the public has a statutory right to explore public lands for locatable minerals. Upon confirmation of the discovery of a valuable mineral deposit, claimants have the right to mine. Where this right has been established, the Forest Service will approve appropriate operating plans to conduct reasonably necessary mineral activities. The public also has an exclusive right to explore for leasable minerals, and to produce both leasable and salable minerals, if a valid lease or permit is held. Whether leases or permits will be issued depends on whether associated mineral activities would meet management requirements. Specific leasing decisions are to be made when lease proposals are received. The Forest workload in minerals management is relatively low. Approximately 20 cases are processed annually in response to notices of intent, operating plans, new leases, common variety permits, or newly filed mining claims.

Claimants having the right to mine or otherwise produce minerals are guaranteed reasonable access for mining purposes. Operators will, however, be required to protect the resources for which these areas are being managed. As a result, operating costs will be higher in areas with prescriptions considered to be highly restrictive to mineral entry than they might otherwise be. This may reduce interest in exploring these areas for their mineral resources, but would not preclude exploration or development should demand justify the higher costs of operation. The relative restrictiveness of the allocations and resource management goals contained in this Plan is displayed in Table IV-19.

Table IV-19. Restrictions on Mineral Activity
(Areas in thousands of acres)

	Withdrawn	High	Moderate	Low
Current Management	105.5	74.5	36.7	415.6
Proposed Forest Plan	105.5	108.9	36.0	381.9

The effect this Plan will have on availability of potential leasable mineral commodities (essentially limited to oil or gas on this Forest) and potential for hydropower development is similar in nature to the effects discussed above.

CULTURAL RESOURCES

In consultation with the State of Washington Office of Archaeology and Historic Preservation (SHPO), the Olympic National Forest will continue to inventory, evaluate, protect, nominate, interpret, and enhance cultural resources. All ground disturbing projects, or other undertakings that may affect cultural resource values, will be surveyed in advance of project implementation to avoid, reduce, or mitigate any loss or damage to these resources. Project-generated survey acreage will range from 2,000 to 5,000 acres per year. In order to develop appropriate evaluation contexts, and to protect resources through a comprehensive approach, additional areas will be surveyed over and above those that are project oriented. A comprehensive approach is essential, as resources would otherwise deteriorate or be lost, destroyed, or damaged if the management approach addressed only those resources that might be affected or impacted by projects. Three to five thousand acres of survey will be programmed each year to satisfy these objectives. Reconnaissance work by cultural resource technicians and professional surveys by archaeologists will be conducted and documented in accordance with Federal regulations, the R-6 CRM Guide, and the Programmatic Memorandum of Understanding between the USDA Forest Service, Pacific Northwest Region, and the Washington State Office of Archaeology and Historic Preservation.

Evaluations of all resources will be made as they are discovered during surveys, in order to avoid or protect resources that may be affected by the implementation of projects. Other known properties and resources will be evaluated as these program elements are budgeted. In the interim, any properties will be managed and protected as eligible for the National Register of Historic Places, so that the features that give them value will not be diminished or lost.

Sites and properties eligible for the National Register of Historic Places will be nominated commensurate with funding for the program element. Every opportunity will be taken to accomplish the task through volunteer efforts, or through use of the open-ended thematic nomination process of the Programmatic Agreement for Management of Depression-Era Administrative Structures. This will reduce costs and increase the efficiency of use of available funds. Enhancement and interpretation efforts will be programmed for specific National Register sites and themes, in order to promote the enjoyment of these resources by the general public. Many other benefits can accrue from such efforts, such as emphasizing the importance of this resource, sharing educational, scientific, and research information, and generating economic opportunities for resource-dependent communities on the Olympic Peninsula. Enhancement and interpretation efforts offer opportunities to coordinate with local Indian tribes, historical societies, museums, academic institutions, and various professional individuals, organizations, associations, and societies. As specific management plans are developed, they will include needed rehabilitation, stabilization, or enhancement items. Monitoring of sites or properties will occur regularly to assure that degradation of values does not occur, and that preventive maintenance is appropriately scheduled.

FOREST MANAGEMENT OBJECTIVES

Incorporated in cultural resource management will be measures to recognize and protect values held by the American Indian community. Cultural, ceremonial, traditional, and religious uses, along with statutory treaty rights, must receive appropriate consideration. Chapters III and IV of the FEIS speak at length to these issues. Chapters IV and V of the Forest Plan speak to goals, management standards and guidelines, and monitoring efforts that will direct the cultural resource management program.

LANDOWNERSHIP

Landownership will be adjusted in accordance with the Olympic National Forest Landownership Adjustment Plan of 1980. Adjustments will be made to facilitate accomplishment of Forest Plan resource management objectives, to consolidate ownership, and to increase the effectiveness and efficiency of general land management. It is intended that all the presently planned exchange activity be completed by the end of the first ten year period following Plan approval. Additional exchange activity beyond that period will be considered as needs and opportunities are identified. The ten-year exchange plan is shown in Appendix A. Acquisitions by purchase are presently not planned, but some activity may develop on a "willing seller" basis for desirable acquisitions in special management areas.

The Small Tracts Act of January 12, 1983 (P.L. 97-465) provides a means of resolving encroachment cases that have occurred through no fault of the adjacent landowner. The Forest is aware of three cases that may qualify under the Small Tracts Act. They are planned for resolution in 1991 and 1992. Other cases will be programmed as the need arises.

In association with resource management activities, approximately 20 to 25 miles of land line location work will be needed annually. Toward the end of the second five-year period of the Plan, emphasis will shift from land line establishment to retracement and maintenance (see Appendix A for schedules).

STRUCTURES AND UTILITY CORRIDORS

There are many structures, facilities and utility corridors on the Forest that provide benefits which serve a broad segment of the general public. Many existing powerlines or water transmission lines contribute to, or have the potential to contribute to, the operation or formation of a utility district, association, or municipal system. Examples of such systems or operations that are authorized uses of National Forest land are:

Power Transmission Lines:

Bonneville Power Administration: Shelton-Fairmont, Fairmont-Port Angeles, and Port Angeles-Sappho.

County P.U.D. Districts: Mason, Jefferson, Clallam, and Grays Harbor Counties.

Water Transmission Lines:

Port Townsend Municipal Water System
Black Diamond Water District
Evergreen Land and Water Company
Neilton Water Association
Lake Quinault Water Association

Telephone Transmission Lines:

U.S. West Communications
Peninsula Telephone and Telegraph

The foregoing types of uses or agreements are considered to be long-term commitments of the Forest. Approval decisions were made considering both environmental concerns and the long-term public benefits that would accrue. Because of their nature, it was not practical to designate these utility corridors on Forest Plan maps. Therefore, they are included by reference, and locations, widths, and standards can be found in Forest case files.

One goal of structure and utility corridor management is to coordinate with County Health Departments to avoid single use water system development that leads to inefficient and ineffective encumbrance of National Forest land. In many instances, such systems do not meet Safe Drinking Water Act standards, especially when they are expanded to include service to multiple families. Benefits to broad segments of the public and formation of local Sewer and Water Districts to effectively provide needed services will receive priority consideration. Single-user facilities and utility lines will usually be considered for interim periods only, and will generally be discouraged or phased out over time.

Electronic Sites:

The following electronic sites have been in use for many years. They provide an administrative and public benefit that, because of location and design, have caused no conflict with other resource values. The Forest's commitment to use of these electronic sites will be continued:

Buck Mountain, Quilcene District
Neilton Point, Quinalt District
North Point, Soleduck District

DESIRED FUTURE CONDITION OF THE FOREST

It is likely to be several decades before effects of management direction contained in this Plan are apparent throughout the Forest. The following descriptions are written to represent likely conditions ten years and fifty years into the future. The descriptions presented here assume this Plan will be implemented and direction will remain constant throughout this 50-year period. However, the direction in this Plan will be reviewed on a 10-year cycle or at least every 15 years, and, when appropriate, direction will be changed or modified through future Plans.

THE FOREST IN TEN YEARS

By the end of the first decade, changes will have been made to implement management direction designed to address public issues and management concerns. Modifications will have included changes in land allocation and management intensity to provide different levels of resource protection and outputs.

SCENERY

The demand for scenic quality will increase on the Forest, especially within key viewsheds that involve high use recreation areas. The appearance of the landscapes within 15 of the Forest's 20 sensitive viewsheds will range from natural appearing to a slightly altered appearance. The other five viewsheds will have a moderately altered appearance.

DESIRED FUTURE CONDITION OF THE FOREST

In viewsheds where the Existing Visual Condition does not meet the established Visual Quality Objectives, there will be an intensified effort to rehabilitate negative visual conditions and move the area closer to the desired level of scenic quality.

The Forest will be managing several scenic byways to provide attractive travel routes for visitors.

New technology will be utilized to manage difficult terrain and dense stands within key viewsheds in order to meet Visual Quality Objectives while implementing silvicultural prescriptions.

In some areas, other ownerships adjacent to National Forest viewsheds will have received extensive timber harvesting. Such areas are not likely to reflect scenic quality considerations.

RECREATION

The Forest will continue to provide a range of recreation opportunities and settings all along the Recreation Opportunity Spectrum, with the exception of the Urban ROS class. New opportunities will exist in the Rural, Roaded Natural, and Roaded Modified ROS classes, but opportunities in the Primitive and Semi-Primitive classes outside Wilderness will be limited.

The Forest will provide the developed recreation sites and facilities needed to meet expected demand. The more heavily used sites and facilities will be reconstructed, and several new sites will be developed. Approximately 950 PAOT of reconstruction and 2,300 PAOT of new site construction will have occurred by the end of the decade. Most sites will have at least some newly reconstructed barrier-free facilities. User fees will be charged at most campgrounds, and will be higher than in the previous ten years.

The vegetation within developed sites will consist of healthy, attractive stands that are free from hazard trees and unwanted vegetation. Vegetation management within developed sites will be consistent with approved vegetative management schedules. These will be aimed at maintaining or enhancing desirable characteristics and user safety.

Nonwilderness dispersed unroaded recreation opportunities will be in high demand and will create unique management challenges. Use within popular unroaded recreation areas will increase. Overcrowding and user conflicts will become more common. There will be a greater need for law enforcement in these areas. Some visitors will experience decreased satisfaction due to overcrowding, user conflicts, and increased law enforcement. Such visitors will seek areas in which these situations do not exist. Visitor use will therefore increase in the less frequently used unroaded recreation areas on the Forest.

Demand for winter use will increase. A few undeveloped snow-play areas and facilities will be developed to help meet this demand and provide for user safety.

Recreation management will involve partnerships with other agencies, user groups, and private enterprise in developing and maintaining recreation facilities, testing new ideas, providing opportunities for special needs, and providing funding.

The Forest will maintain and enhance existing interpretive facilities. Educational programs will have been added to help increase visitor awareness and understanding of natural and cultural resources and their management.

WILDERNESS

The total acreage of Wilderness (88,265 acres) will not change during the decade.

Demand for Wilderness recreation opportunities will continue to increase on the Forest. Some Wilderness visitors will experience decreased satisfaction with high levels of use, increased law enforcement, and/or the management techniques needed to implement the "Limits of Acceptable Change" (LAC) process.

Increases in Wilderness use will result in the need for management actions to reduce unacceptable user impacts. Management actions will be more direct than at present, with use of permits and limitations on the number of visitors allowed within a given area being more common.

In some areas within Wildernesses in which the impacts of use are currently considered unacceptable, rehabilitation and improvement due to implementation of the results of the LAC process will begin to show. Although a decade is barely sufficient time to notice substantial improvement, a general upward trend in the quality of the Wilderness environment should be apparent.

Wilderness user education programs will continue, and will be expanded. These will be aimed at educating the Wilderness visitor regarding the "minimum impact" concept, the Limits of Acceptable Change process, and Wilderness values.

CULTURAL RESOURCES

By the end of the first decade, a formal survey design strategy will be documented, in place, and routinely used in all survey and reconnaissance work.

The Geographic Information System (GIS) will be a functional tool for identifying sensitive areas and areas of high probability for location of cultural resources. Survey and reconnaissance cost-effectiveness will be significantly improved.

AMERICAN INDIANS

All Olympic National Forest line and staff officers and first line supervisors will have completed training and awareness programs covering the treaties negotiated between the United States and Olympic Peninsula Indian tribes.

Accomplishments are documented concerning joint efforts of the tribes and the Forest Service to locate and protect important religious, ceremonial, and traditional sites or uses.

Key tribal and Forest Service contact persons have been designated, and sufficient contact is made so that everyone is known on a first-name basis. Efforts toward, and effectiveness of, contacts by Forest Service employees are strongly emphasized.

LANDS

Standardized collection agreements and rate schedules have become a routine tool for processing special use applications. Non-refundable special use application filing fees are a mandatory prerequisite for applications to be processed.

Permittee self-inspection reports and documentation are utilized to identify deficiencies and to prepare permittee action plans for compliance, correction, or changes.

DESIRED FUTURE CONDITION OF THE FOREST

OLD-GROWTH

The Forest will still have an extensive acreage in old-growth, with roughly 245,000 acres remaining at the end of the decade. This represents a decrease of approximately 22,000 acres from the present acreage. The areas in which the decrease will be most noticeable will be on the edges of presently unroaded areas and within areas that have traditionally been managed for timber. Spotted owl habitat areas (SOHAs) will provide large blocks of old-growth scattered across the Forest. Pileated woodpecker and pine marten areas will also be providing stands of old-growth distributed among managed timber stands. Riparian areas and major travel corridors should still have substantial old-growth components.

TIMBER HARVEST AREAS

The goal of producing timber on a sustained-yield basis will have been implemented on the Forest. With the exception of small parts of some of the previously unroaded areas, the areas within which harvest will occur will be much the same as those which have been the site of harvest activity in the past. There will be less clearcutting within riparian areas, and more of the annual volume will be coming from commercial thinnings and smaller diameter material than has occurred in the past. Silvicultural prescriptions will sometimes call for retaining residual old-growth stand components in an effort to maintain old-growth characteristics on the site after harvest.

The total acreage in created openings will be approximately half that which occurs at present. Fewer openings will have been burned, with the result that the Forest will look much "greener" in many areas. More standing snags and reserved trees (both single and in clumps) will break up the continuity of the "clearcut" look.

Fuelwood will be available from the Forest, but it will be somewhat harder to find. Travel times to fuelwood sources will have increased, and more people will be looking for available fuelwood.

ROAD AND TRAIL SYSTEMS

The emphasis of road system management will change from construction to reconstruction, maintenance, and traffic management. Many roads will be at least seasonally closed for wildlife and other resource concerns. An estimated 141 miles of new road will be added to the system by the end of the decade, with most of this mileage in local roads accessing timber harvest areas. The mileage of closed roads will increase by approximately 135 miles, so there will be little net change in system mileage open for travel.

The total mileage of trails will have increased, with an increase in facilities available for off-road vehicles. Trails will be well maintained, and most of the existing substandard trails will have been reconstructed. Trail use by all user types will increase. The season of use will extend into the winter months in low elevation areas.

SOIL AND WATER

The condition of vegetation in riparian areas will be less disturbed. There will be less clearcutting in riparian areas. Implementation of Forest-wide Standards and Guidelines will maintain or improve water quality and provide the structural components necessary for diverse, high quality riparian habitat. Frequent and well distributed complexes of large organic debris interact over time to create a diversity of aquatic habitat types. Riparian areas associated with Class I and II streams will be characterized by vegetation conditions that emphasize maintaining existing vegetation. Riparian areas along many Class III and IV streams will have been converted to early seral stages using management practices that maintain channel stability and water quality.

DESIRED FUTURE CONDITION OF THE FOREST

The Forest will require use of timber harvest systems that minimize soil displacement and soil compaction. More emphasis will be placed on surface water management and erosion control to keep soils in place and prevent erosion so as to maintain soil productivity.

Sediment levels in major streams will have significantly decreased in comparison to current conditions. Summer water temperatures throughout the Forest will be well within the tolerance levels of aquatic organisms historically found in the streams.

Demands on the water resource as a potential source of energy (hydropower) will continue. Projects that are constructed will include restrictions or mitigation measures to protect soil, water, and other resources.

FISH AND WILDLIFE HABITAT

Anadromous fish production will have increased by as much as 15 percent as a result of both reduced sedimentation of streamcourses and habitat enhancement projects designed to improve the balance between spawning and rearing habitat. Total recreational and commercial fish catch will have increased, although greater demand for recreational fishing may result in reduced success rates for individual users.

Wildlife species utilizing streamside areas will be benefitted by the standards and guidelines covering riparian area management. Riparian habitat conditions will have begun to approach a highly varied, well-balanced mix of habitat types. Old-growth will be well represented as a component of riparian habitat.

Increased levels of retention of snags and down woody material within timber harvest areas will aid in maintaining well-distributed habitat for species dependent upon these timber stand components. Populations of these species will be well above the minimums needed to assure viability.

Deer and elk populations will remain relatively stable. Hunting may be more challenging (but of higher quality) because more roads will be closed during hunting season. Increased demand for hunting may lead to reduced success rates for individual hunters.

Habitat for northern spotted owls and other species dependent on old-growth or mature forest conditions will be available at a level close to that which exists today. Over 90 percent of the current acreage of old-growth habitat will remain. Habitat availability will be well above the level considered necessary to maintain viable populations of the relevant indicator species, with habitat areas well-distributed throughout the Forest.

UNROADED AREAS

Approximately 71,500 acres of the currently unroaded areas will remain at the end of the first decade. This is over 80 percent of the area presently classified as unroaded.

Unroaded areas outside of Wilderness will not be able to accommodate the total demand for Primitive and Semi-Primitive recreation. Unroaded areas which have historically received little use will become more valuable for undeveloped recreation as the gap between demand and availability widens. Overcrowding, user conflicts, and law enforcement activities in the more popular undeveloped areas will tend to drive some undeveloped recreation visitors to seek other, less crowded unroaded areas.

WILD AND SCENIC RIVERS

Although only three of the rivers on the Peninsula were recommended for Wild and Scenic designation, there should not be much change in the corridors of most rivers. The River Corridor allocation should have provided substantial protection for the major rivers of the Forest.

DESIRED FUTURE CONDITION OF THE FOREST

LOCAL COMMUNITIES

Opportunities for the Forest to help enhance the vitality of surrounding communities will occur through a Regional initiative called the Pacific Northwest Strategy. It is envisioned that the Pacific Northwest Strategy will be a new focus of operation for many people, one that empowers Forest Service people and local citizens to look and work beyond the traditional boundaries. At the same time, it reaffirms and emphasizes working with other government agencies, local businesses, and the communities themselves in a spirit of interdependency and cooperation that has always existed at the local Ranger District level. As the Strategy becomes an integral part of doing business, its central focus will be to foster and enhance communication, cooperation, and partnerships.

THE FOREST IN FIFTY YEARS

By the end of the fifth decade, results of management direction implemented under this Plan will be more apparent.

SCENERY

The demand for scenic quality will be high and continue to increase, especially in viewsheds involving heavily used recreation areas. The appearance of viewshed landscapes will be attractive and diverse. Seven of the 20 sensitive viewsheds will have a natural appearance, and the remaining 13 will have a slightly altered appearance.

In viewsheds where existing visual condition did not meet established Visual Quality Objectives, the landscape will be well on its way toward reaching an undisturbed appearance and show substantial progress toward the desired level of visual quality.

The Forest will be managing several Scenic Byways. These will have become established as popular and heavily-used routes for scenic drives.

Development of new technology will have continued, further reducing the cost and difficulty of managing steep terrain and dense stands. Visual and silvicultural prescriptions will be fully compatible in such areas, and Visual Quality Objectives will be met without difficulty.

Adjacent landowners may have become more sensitive to scenic values, but it is likely that lands adjacent to National Forest land will still show major visual contrasts in some viewsheds.

RECREATION

The Forest will continue to provide a range of recreation opportunities and settings all along the Recreation Opportunity Spectrum. Opportunities in the Rural, Roaded Natural, and Roaded Modified ROS classes will have continued to increase, while opportunities in the Semi-Primitive and Primitive classes will have decreased to their ultimate level.

The Forest will continue to provide the developed recreation sites and facilities needed to meet expected demand. Most of the heavily used sites and facilities will have been reconstructed, and several new sites will have been developed. Approximately 3,430 PAOT of reconstruction and 4,400 PAOT of new site construction will have occurred by the end of the next fifty years. Most facilities will provide barrier-free access. User fees will be charged at all but a few rustic campgrounds, and these fees will have continued to increase.

Vegetative management schedules for developed sites will have been implemented, producing attractive stands that are free of hazards. Some sites will contain stands that are diverse in age and size, while others will have stands characterized by more uniform sizes and ages.

Nonwilderness dispersed unroaded recreation will remain in high demand, and use of areas providing this recreation opportunity will have continued to increase. At the same time, the area falling within the Primitive and Semi-Primitive ROS classes will have been reduced to its ultimate acreage. Users will probably have become accustomed to high user density, use management, and high levels of law enforcement activity.

Winter recreation use will have increased, and there will be several areas developed on the Forest to meet the demand for snow-play activities.

Partnerships will be an effective and common method of managing a dynamic recreation program. The public sector will be actively involved in operating and maintaining recreation sites and facilities.

The Forest's interpretive and educational facilities and programs will have accomplished management goals, and will continue to provide the visitor with the information needed to ensure an enjoyable and safe visit to the Forest. Increasing the visitor's understanding and awareness of natural and cultural resources and their management will continue to be a high priority.

WILDERNESS

The acreage of designated Wilderness is likely to be at or very close to the current designation of 88,265 acres. Some potential additions may have been made in response to changing priorities or demands for Forest resources. Such additions would probably have been relatively small.

Use will continue to increase, with the most accessible areas continuing to show the effects of high use. Limitations and regulations will play a major role in managing the Wilderness and in implementing the results of the Limits of Acceptable Change process. Overall, users will probably have accepted the LAC program and will be committed to it.

In some areas within Wildernesses in which the impacts of use are currently considered unacceptable, rehabilitation and improvement due to implementation of the results of the LAC process will have taken effect. Substantial improvements in the quality of the Wilderness environment should be apparent in these areas.

User education programs have proven effective and will continue to be conducted. They will have provided Wilderness users with the type of information that has made them minimum-impact visitors. These users will be committed to the Limits of Acceptable Change process. Visitors will have the opportunity to apply the techniques and concepts of conscientious Wilderness use during their visits.

There will be limitations on the size of parties entering Wildernesses. Some high use undeveloped recreation areas, in both the Forest and Park, will require an entrance fee.

CULTURAL RESOURCES

The cultural resource inventory will be essentially complete, although survey and reconnaissance will continue. The cultural resources of the Forest will continue to be well-protected.

DESIRED FUTURE CONDITION OF THE FOREST

AMERICAN INDIANS

Cooperative efforts to locate and protect important religious, ceremonial, or traditional sites or uses have resulted in a thorough inventory of such areas. Protection measures have become a routine component of the conduct of Forest activities.

LANDS

See "The Forest in Ten Years." The same conditions will apply in fifty years.

OLD-GROWTH

There will be noticeably fewer acres of old-growth than in the previous 50 years. Approximately 82,000 acres of old-growth will have been harvested since 1990. The retention of old-growth in SOHAs, pileated woodpecker and pine marten areas, river corridors, undeveloped unroaded recreation areas, Wilderness, and other allocations will, however, provide a significant old-growth component within the Forest's vegetative structure. Approximately 185,000 acres of old-growth will remain on the Forest. A person still will not have to travel very far to get into an old-growth stand, although these stands will often be somewhat remote. The removal of old-growth allocated to timber harvest prescriptions will be close to complete, and almost all of the old-growth stands still present fifty years from now will be retained permanently.

TIMBER HARVEST AREAS

Evidence of intensive management for timber production and other forest products will be apparent throughout the areas to be managed for this purpose. The forest within timber management areas will be approaching an even distribution of tree sizes, from seedlings to mature sawtimber. The second cutting cycle will be well under way on National Forest land in the Shelton CSYU. There will be much more commercial thinning activity, but the primary means of regenerating timber stands may still be clearcutting. Many of the extremely overstocked, stagnated (doghair) stands will have been converted to faster-growing timber stands. The effects of silvicultural prescriptions which retain some old-growth characteristics on the site after harvest will be noticeable across the Forest.

Fuelwood gathering for personal use will still be occurring, but demand will have decreased. Available fuelwood will be difficult to find and much smaller than it used to be. Machinery used to harvest and manufacture forest products will leave much less residual material.

ROAD AND TRAIL SYSTEMS

The annual mileage of new road construction will be greatly decreased. Many roads will be closed, at least seasonally, to reduce maintenance costs and minimize disturbance to wildlife. The Forest's road system will be essentially complete, with a total of just over 3,000 miles of forest development roads. Approximately one-third of these will be closed to travel at any given time, up from the 23 percent closure level of today. Road system expansion (415 miles) and road closure expansion (just over 400 miles) will balance each other almost exactly, so there will be little net change from the present in open road miles.

Trail mileage will have increased, and there will be a range of user opportunities consistent with demand. Several off-road vehicle facilities will have been developed, and these should not conflict with either resources or other recreation uses. Winter trail use will have continued to increase.

SOIL AND WATER

The demand for water will increase, along with growing concern for clean water. Watershed conditions on National Forest land should be improved over current conditions, since there will be less soil erosion and sediment entering streams. Also, concern will remain about management practices and their possible long-term effects, primarily those associated with timber harvest and related road construction. There will be increased emphasis on soil productivity, and the Forest will be requiring the use of logging systems and techniques that minimize soil degradation. Most roads needed to manage the Forest will be in place, and the amount of soil displacement (sediment) and erosion from construction will decrease.

Although trees will still be removed from riparian areas, the amount of clearcutting will be reduced and the vegetation not as disturbed as it used to be. The overall size of trees in the riparian areas will be larger, especially on the southern part of Hood Canal Ranger District.

Demand for hydropower will have increased from twentieth century levels, and construction of some projects will occur. The technology for hydropower development will progress to the point where it will no longer pose a serious threat to anadromous fish, and projects will be constructed where practical.

FISH AND WILDLIFE HABITAT

Anadromous fish production will have increased to as much as 25 percent above current levels as a result of both reduced sedimentation of streamcourses and habitat enhancement projects. The balance between spawning and rearing habitat will be as close to optimal as can be achieved through an ongoing program of enhancement and maintenance activities. Total recreational and commercial fish catch will have increased substantially, although continued growth in demand for recreational fishing may result in reduced success rates for individual users.

Wildlife species utilizing streamside areas will be benefitted by the standards and guidelines covering riparian area management. Riparian habitat conditions will have reached a highly varied, well-balanced mix of habitat types. Old-growth will continue to be well represented as a component of riparian habitat.

Increased levels of retention of snags and down woody material within timber harvest areas will aid in maintaining well-distributed habitat for species dependent upon these timber stand components. Populations of these species will be well above the minimums needed to assure viability.

Deer and elk populations will remain relatively stable, although slightly below current levels. Continued expansion of the road closure program will have served to enhance the challenge and quality of the hunting experience. Increased demand for hunting may have resulted in substantially reduced success rates for individual hunters.

Habitat for northern spotted owls and other species dependent on old-growth or mature forest conditions will continue to be available at a level only moderately reduced from that which exists today. Almost 70 percent of the current acreage of old-growth habitat will remain. Habitat availability will be well above the level considered necessary to maintain viable populations of the relevant indicator species. Habitat areas will continue to be well-distributed throughout the Forest, although the spacing of these within timber management areas may involve distances that are close to the maximum considered acceptable under current Management Requirement specifications.

UNROADED AREAS

Approximately 57,500 acres of the currently unroaded areas will remain at the end of the fifth decade. This is approximately two-thirds of the area presently classified as unroaded.

DESIRED FUTURE CONDITION OF THE FOREST

Unroaded areas outside of Wilderness will not be able to accommodate the total demand for Primitive and Semi-Primitive recreation, which will have increased while acreage providing such recreation opportunities has decreased. Virtually all of the remaining unroaded areas will be used at a level at or above their capacity to provide high quality experiences. By and large, users will have become accustomed to high use levels, management of use, and law enforcement activities in the more popular unroaded areas.

WILD AND SCENIC RIVERS

The Gray Wolf, Dungeness, and Duckabush Rivers should have received Congressional designation as Wild and Scenic Rivers to be managed by the Forest Service. Specific management plans will have been developed and will be implemented within the river corridors. Most of the other significant rivers on the Forest will have been managed under the River Corridor prescription, and will therefore have maintained most of their unique natural characteristics.

LOCAL COMMUNITIES

Each community will have capitalized on its uniqueness and involved its citizens in the development of a desired future. The activities associated with the Pacific Northwest Strategy will continue to support the goals and plans of resource-dependent communities.

FOREST-WIDE STANDARDS AND GUIDELINES

These Forest-wide standards and guidelines provide the limits within which management practices will be implemented in achieving planned objectives. They supplement, but do not replace, direction from the Regional Guide for the Pacific Northwest Region and from Forest Service Manuals and Handbooks.

It will be helpful to remember the following use of specific words, the "helping verbs," to convey intent of direction expressed in standards and guidelines in this section. These same words and intent are also used in expressing direction for the management area prescriptions.

HELPING VERBS

must, shall

should, ought

may, can

will

DEGREE OF RESTRICTION

Action is **mandatory**.

Action is **required**, unless reason exists for not taking action (as identified in environmental assessments).

Action is **optional**.

Is not restrictive; applies only to a statement of future condition or an expression of time. **Do not use in place of shall.**

FOREST-WIDE STANDARDS AND GUIDELINES BY PROGRAM ELEMENT

A. Recreation

1. Management activities should meet Visual Quality Objectives. Note that in A2 (Scenic) areas VQOs **shall** be met.
2. Management activities should be compatible with Recreation Opportunity Spectrum (ROS) class criteria within and adjacent to each management prescription.
3. Interpretive activities should be aimed at meeting one or more of the following objectives:
 - a. Assist resource managers in implementing and accomplishing resource management objectives.
 - b. Encourage Forest visitors to increase their awareness and understanding of resource management practices.
 - c. Increase the visitor's understanding of and orientation to the resources and features of the Forest.

FOREST-WIDE STANDARDS AND GUIDELINES BY PROGRAM ELEMENT

- d. Provide opportunities for enhancement of the Forest visitor's recreation experience on the Forest.
- 4. The Forest Service's Recreation Strategy should be implemented in cooperation with other recreation providers in the Olympic sub-region or other appropriate area.

B. Cultural Resource Management

The Forest should provide for a comprehensive program to inventory, evaluate, nominate to the National Register, protect, enhance, interpret, and monitor cultural resources. A comprehensive program shall recognize management opportunities and partnerships that we can share with adjacent landowners, other Federal agencies, State and local governments, and others. Examples are shared data bases, interpretive opportunities, skills and technical knowledge, development of research designs, survey strategies, and training.

1. Inventory

- a. The completed cultural resource overview of the Forest shall be maintained and updated. The overview should be utilized to summarize previously-recorded cultural resource information for the Forest; provide a framework for evaluating cultural resources identified through the inventory process; aid in the development of a research design to guide future surveys, inventories, and scientific investigations; and identify opportunities for interpretation of a range of cultural resource properties.
- b. Cultural resource inventories shall be conducted on areas where initial ground-disturbing activities are scheduled. This phase of inventory shall be emphasized to ensure discovery and protection of locatable cultural resources in advance of implementing project activities.
- c. Inventories of areas not affected by projects should be scheduled and systematically programmed in order to complete a comprehensive Forest-wide inventory and evaluation of cultural resources.
- d. A survey design and cultural resource inventory plan should be completed to guide all inventory activities to maximize efficiency, and prescribe types and intensities of surveys by geographic areas.
- e. Results of project level cultural resource inventories shall be documented through environmental analysis for the project. Cultural resource consultation shall be documented according to the current Memorandum of Understanding between the Washington State Office of Archaeology and Historic Preservation (SHPO) and the USDA Forest Service, Pacific Northwest Region.
- f. An inventory site list of cultural resources should be updated regularly to reflect additions to the data base. The backlog of sites that lack complete records should be reduced through a systematic program of recordation and updating.
- g. Post-project monitoring techniques and results should be utilized to help locate and discover cultural resources, and to further develop survey design strategies and predictive modeling for future ground-disturbing project activities.

2. Evaluation and Assessment

- a. The significance of inventoried sites shall be evaluated by applying the criteria for eligibility to the National Register of Historic Places. Sites may be treated as individual properties, thematic groups, or historic districts. Priority should be given to those properties that may be affected by project activities. A plan should be developed to evaluate all other cultural resources through cost-effective means as the Forest-wide inventory nears completion.
- b. Cultural resources that meet the appropriate criteria for eligibility to the National Register of Historic Places shall be nominated.
- c. The effects of all Forest Service undertakings on significant cultural resources shall be considered, and measures shall be taken to avoid or mitigate any adverse effects. An evaluation and assessment of effects shall be conducted prior to maintenance, rehabilitation, and moving or removal of any structure that may have cultural value. Included in this category shall be any privately-owned structures located on National Forest lands under special use authority. Evaluation and assessments of effects shall be performed in consultation with the State Historic Preservation Officer (SHPO). If necessary, the Advisory Council on Historic Preservation should also be consulted.

3. Protection and Enhancement

- a. Until proper evaluation occurs, all known cultural resource properties shall be protected.
- b. Project management plans should be developed for all sites eligible and on the National Register of Historic Places. Primary emphasis should focus on protection of the site and maintaining the integrity of the qualities and characteristics that make the property eligible for the National Register. Other considerations in management plans include coordination with American Indians and identifying compatible or adaptive uses such as administrative use or appropriate public and private use authorized by special use permit, including provisions for maintenance agreements.
- c. Programmatic Memoranda of Agreement and/or project management plans (in consultation with the SHPO and Advisory Council) should be developed for the protection of classes of prehistoric and historic resource properties found on National Forest land. Examples include mining improvements, railroad logging properties, prehistoric lithic scatters, stripped cedar trees, and historical properties under special use permit.
- d. Every cultural resource project management plan should address possible opportunities for educational/interpretive programs.
- e. Opportunities should be provided for scholarly/scientific study of cultural resource sites through cooperative agreements, study permits, and contracts with qualified institutions, organizations, and individuals.
- f. In consultation with the Washington SHPO and, if necessary, the Advisory Council, the Forest shall develop measures to protect significant sites from adverse effects due to general Forest resource management activities or management practices. These measures may range from complete avoidance of the site and corresponding protection of its environmental setting, to mitigation procedures, such as data recovery or recordation to Historic American Buildings Survey standards.

- g. Confidentiality of cultural resource site locations shall be maintained as required by the National Historic Preservation Act.
- h. National Register eligible cultural and historic resources shall be protected from degradation due to public use and natural deterioration. Protection activities may include, but are not limited to, scientific study and collection (as outlined in a data recovery plan), the use of fences and barriers, proper use or removal of signs, stabilization techniques, closure orders, patrol and site monitoring, maintaining site anonymity, and gaining public understanding and support through education.
- i. Decisions on the maintenance level for eligible historic structures should be based on an analysis of utility, interpretive value, public interest, existing site or area allocation, funding sources, and existing agreements. Eligible sites shall be maintained, or the resultant adverse effect shall be mitigated.
- j. Religious sites and resources identified under the American Indian Religious Freedom Act shall be managed in consultation with affected tribes.

C. Wilderness

Wilderness boundaries shall be marked prior to implementing projects next to Wildernesses that will affect Wilderness values.

D. Wildlife, Fish, and Threatened, Endangered, and Sensitive Species

1. Threatened, Endangered, and Sensitive Species

- a. Consultation shall be initiated with the USDI Fish and Wildlife Service whenever an action may affect a Federally-listed threatened or endangered species. Protection of essential habitat for sensitive species should be coordinated with the State.
- b. In all areas where threatened, endangered, or sensitive species of plants or animals may occur, surveys shall be performed prior to any major project design. If a threatened, endangered, or sensitive species is found, a biological evaluation shall be performed to determine the effect of the project on the species.
- c. Federally listed endangered and threatened species shall be identified, inventoried, and managed in cooperation with the USDI Fish and Wildlife Service. Management of sensitive species should be coordinated with the Washington Department of Wildlife (animals), and Washington Department of Natural Resources (plants).
- d. Where management activities or other agents threaten the continued viability of threatened, endangered, or sensitive plants, the threatening activity or agent shall be controlled, removed, or terminated.

- 2. Bridges, culverts, and fords that cross anadromous fish-bearing streams shall provide unobstructed passage for adult and juvenile anadromous fish. Road crossings of resident trout streams should also maintain or improve fish passage.

3. The Statewide Comprehensive Wildlife and Fisheries Management Plan shall be continued and updated, at least annually, in cooperation with the State of Washington Departments of Fisheries and Wildlife.
4. Road, trail, and area closures and restrictions of motorized use may be employed to reduce disturbance to unique, uncommon, or vulnerable habitats, such as rutting and calving areas, nesting sites, and fish spawning/holding areas.
5. Fish stocking of lakes and streams may occur as directed in the Olympic National Forest's "High Lake and Stream Survey Report, Parts 1 and 2" and/or the Memoranda of Understanding with the Washington Department of Wildlife, the Department of Fisheries, and the Treaty tribes, except as limited by Wilderness management.

6. Wildlife Trees

Wildlife trees shall be managed at a level necessary to meet the Regional policy of maintaining effective populations of primary cavity excavators in excess of 40 percent of their potential population levels. Dead and defective tree habitat should be managed by units such as the Integrated Resource Analysis Areas (IRAAs), where specific objectives can be established and monitored. The following guidelines apply:

- a. Snag densities needed to meet Management Requirement specifications for cavity excavators should be provided within land areas that are generally no larger than normal harvest unit size (60 acres).
- b. A snag recruitment model should be used to determine the number of green trees necessary to meet the snag objectives. This will be determined on a case-by-case basis. Planning analysis indicates that an average of two green trees per acre greater than 15 inch DBH and 1.7 green trees per acre greater than 19 inch DBH should be left in regeneration harvest units and other activity areas where vegetative manipulation occurs. This is an average which may vary based on site specific conditions, including the number of existing snags available in the area. If larger trees are left, fewer will be necessary.
- c. In even-aged management areas, wildlife trees should be managed in patches wherever existing distribution of snags and live trees allows. In other areas, either patches or more evenly distributed snags are acceptable.
- d. Douglas-fir and western redcedar are the preferred species for snags and reserve trees. When trees of the desired species are not available, other conifers representing the average character for the stand should be retained.
- e. Dead standing trees which meet State and Forest safety requirements should be left in timber harvest areas or adjacent to roads.
- f. In addition to snags and reserve green trees, an average of at least three down trees per acre should be left evenly distributed in timber harvest and other activity areas. Down material should be at least 21 inches in diameter at the large end, and 16 feet long. If material of this desired condition is not available, the largest that is present will be left.
- g. Snags, reserve trees, and down logs should be protected from harvest and fuel treatment operations, firewood cutting, and future salvage activities.

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7. Fish habitat capability within a drainage should be maintained at no less than the existing level.
8. Recreational hunting or trapping regulated by the Washington Department of Wildlife should be the preferred method of controlling animal populations.
9. Potential actions involving nonindigenous fish and game (e.g. mountain goats) shall be coordinated with the Washington State Departments of Wildlife and Fisheries. Use environmental analysis when appropriate.
10. Wildlife habitats which are limited on the Forest, including marshes, wetlands, cliffs, taluses, lakes, tidal lands, and areas of colony nesting, shall be maintained or enhanced so that their habitat characteristics are not lost.
11. Nesting sites of osprey and blue herons should be protected by avoiding planned activity within 500 feet of the nest during nesting season. The size of the the protection area and mitigative management measures may vary, and should be determined on a case-by-case basis.
12. Impact on habitat for the management indicator species groups should be determined for each project in terms of habitat quality, quantity, and distribution.
13. Peregrine Falcon Habitat

Peregrine falcon habitat shall be protected in compliance with the objectives of the Pacific Coast Recovery Plan for the American Peregrine Falcon (USDI Fish and Wildlife Service, 1982). Any nest found shall be protected; associated habitat (such as feeding areas) shall be protected and enhanced, if necessary.

14. Northern Spotted Owl Habitat

The following standards and guidelines shall be used when spotted owl nests are found outside of the spotted owl habitat network.

- a. Areas proposed for project activity which contain habitat suitable for spotted owls shall be surveyed according to current standard Forest Service inventory procedures.
- b. Any spotted owl nest found outside of the spotted owl habitat network shall be protected during the year that it is active. The level of protection shall be determined through an interdisciplinary process based on the site-specific needs of the nest. The nest site shall be surveyed for 2 years following the year in which it was active to assure that it is no longer being used before any project activity is implemented.

15. Elk and Deer Winter Range

The following is interim planning direction. During Plan implementation, the Forest will be developing more site-specific direction for each herd unit. This direction will be developed using Habitat Effectiveness Indices (HEI) to assess winter range needs on a herd-by-herd basis. The information required for such analysis is incomplete at the present time and is not available for this Plan.

- a. Within the winter range, there are some areas which are considered to be **necessary** for big game winter survival. This would be expected to be an area substantially less than the total area of winter range. On those lands identified as necessary for elk and deer winter

survival, habitat should be managed to provide approximately 10 to 15 percent of the area in created or natural openings, with the remainder of the area in a combination of hiding and thermal cover. An area shall be considered a created or natural opening if it has 60 percent or less crown closure. Twenty percent of the area necessary for winter survival should be managed as "optimal cover" having overstory and understory canopies which provide forage and snow intercept characteristics. These criteria are generally achieved when: 1) The dominant trees average 21 inches in diameter or greater, 2) there is 70 percent or greater crown closure, and 3) the stand is predominantly in a large sawtimber condition. It is expected that much of this cover will be present in River Corridors, Scenic Areas, riparian areas, and in areas not available for timber harvest, such as undeveloped recreation areas. Exceptions will be identified through herd unit analysis during Plan implementation. For elk habitat, the size of the area evaluated should correspond to that used by the local elk herd, if there is one.

- b. Roads should be managed to reduce wildlife disturbance.

16. Additional Raptors

Nest sites being actively used by raptors shall be protected from human disturbance until nesting, feeding, and fledging have been completed. Protection of the nest sites should be sufficient for the species involved and maintain the integrity of the present tree structure and the characteristics of the surrounding habitat. Inactive raptor nests should be protected to provide nesting quarters for opportunistic (non-nest building) raptors. The appropriate level of protection will be determined through the interdisciplinary analysis process on a site-specific basis. Nesting areas are divided into primary and secondary zones:

- a. Primary

- 1) The boundary of the primary zone should not be less than 300 feet. The management objective for this zone is to maintain the present habitat characteristics.
- 2) The critical period during which human activities should be restricted will usually fall between March 1 and August 31.

- b. Secondary

- 1) The boundary of the secondary zone should be an additional 300 foot radius beyond the primary zone (total 600 foot radius). The management objective for this zone is to serve as a modified treatment area between the primary zone and the full treatment area beyond the secondary zone.
- 2) The critical period is the same as addressed above in primary zone.

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E. Range

Grazing activity should be provided at levels compatible with other resource goals.

F. Timber

NOTE: Chargeable volume is wood fiber that was included in growth and yield projections for management prescriptions applied on lands suitable for timber production and used to arrive at the allowable sale quantity based on Regional utilization standards as found in the Pacific Northwest Regional Guide. Cull, tops, fuelwood, and scattered dead trees (normal mortality) are considered **nonchargeable volume**. Utilization standards on timber sale contracts may vary depending on markets and cost of harvesting.

1. Timber sales shall be scheduled based on resource needs and objectives as determined by an evaluation of Integrated Resource Analysis Areas (IRAAs). Timber sale alternatives shall be formulated and analyzed within the context of the IRAA analysis. IRAA-specific resource data will be stored for future scheduling and planning.
2. Timber harvesting shall be programmed based on the following priorities:
 - To harvest mortality from insect, disease, blowdown, and fire.
 - To improve growth of culminated stands through even-aged harvesting methods on suitable lands.
 - To improve growth and thrift of timber stands through commercial thinnings.
 - To provide ecologically diverse stands, including stands with some old-growth characteristics remaining after harvest.
3. Size and Dispersal of Openings
 - a. Forest openings created by the application of even-aged harvest cutting methods shall be limited to a maximum size of 60 acres in the Douglas-fir type (as defined by the Regional Guide) and to a maximum size of 40 acres for all other forest types. Exceptions are permitted for natural catastrophic events (such as fires, windstorm, or insect and disease attacks) or on an individual basis after a 60-day public notice period and review by the Regional Forester.

In addition, the limits may be exceeded by as much as 50 percent without necessitating review by the Regional Forester or 60-day public notice when exceeding the limit will produce a more desirable combination of net public benefits, and when any one of the following four criteria is met:

- 1) When a larger created opening will enable the use of an economically feasible logging system that will reduce the disturbance to soil, water, fish, riparian resources, or residual vegetation. Such reductions can be achieved by reducing landing or road construction, by enabling such construction away from unstable soil, or by reducing soil and vegetation disturbance caused by lack of suspension of logs.

- 2) When the created opening cannot be centered around groups of trees infected with dwarf mistletoe or root rot and therefore needs to be expanded to include these trees in order to avoid infection of susceptible adjacent conifers.
 - 3) When Visual Quality Objectives require openings to be shaped and blended to fit the landform.
 - 4) When larger openings are needed to achieve regeneration objectives in harvest areas being cut by the shelterwood method, and where destruction of the newly created stand would occur as a result of delayed removal of shelter trees. This exception applies only to existing shelterwood units and to shelterwood units under contract prior to approval of the Forest Plan.
- b. Created openings shall be separated by blocks of land that generally are not classed as created openings and that contain one or more logical harvest units. Sizes and stand structures of these blocks shall be appropriate to meet resource requirements of the Forest Plan. Resource requirements may include wildlife habitat, watershed, landscape management, and others. Contiguous harvest units (cornering or otherwise touching) are not precluded, but must be considered as a single opening which must be created within requirements for size, exception procedures, and justification.

The total area of created openings contiguous to 30-acre or larger natural openings should normally not exceed one-third the size of the natural opening and not occupy more than one-third of the natural opening perimeter. Openings should not be created adjacent to any natural openings (regardless of size) unless adequate vegetation along the edge can be developed or retained in sufficient density to protect wildlife and meet Scenic objectives. The determination of adequate vegetation will be made by an appropriate interdisciplinary team.

- c. A harvested area of suitable forest land will no longer be considered a created opening for planning purposes when stocking surveys, carried out in accordance with Regional instructions, indicate prescribed tree stocking that is at least 4-1/2 feet high and free to grow. When other resource management considerations (such as wildlife habitat, watershed needs, or visual requirements) prevail, a created opening will no longer be considered an opening when the vegetation in it meets a particular management objective. For example, the objectives for a specified big-game winter range might require trees to be 20 feet tall before the adjacent stand may be harvested. In other instances, entry may be made sooner to meet specific resource or management requirements.
4. Timber harvest shall not be programmed from the following lands:
- Those that have been withdrawn legislatively or administratively by the Secretary of Agriculture or Chief of the Forest Service.
 - Those where technology is not available that will ensure timber production without irreversible resource damage to soil productivity or watershed conditions.
 - Those where there is not reasonable assurance that lands can be adequately restocked within 5 years of final harvest and 10 years after the regeneration cut in shelterwoods.

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5. Where consistent with management area prescriptions, salvage or sanitation harvest of individual trees or stands damaged by fire, windthrow, or insects or disease may occur. An environmental analysis shall be prepared for salvage or sanitation harvest activities.
6. Salvage or sanitation harvest should be done in a silviculturally sound manner and, when appropriate, should require a regeneration prescription.
7. Log suspension, directional felling, and lateral yarding capabilities should be required as needed to meet resource concerns and/or improve utilization. This may entail full log suspension in areas that have a significant potential for soil loss from slope movement or erosional processes resulting from ground disturbance.
8. Long-span and helicopter yarding systems should be supported by economic and/or resource benefits.
9. As it becomes economically feasible, removal of residue biomass not needed for other resources should be required.
10. Silvicultural prescriptions shall be prepared for all activities proposing vegetative manipulation through timber harvest. All prescriptions shall be prepared or approved by a certified silviculturist.
11. Areas of high risk of slope instability due to loss of root strength should incorporate a geotechnical analysis as part of the environmental assessment process.
12. Timely site preparation for artificial regeneration should occur to assure adequate stocking within three years of final harvest.

Timely site preparation for natural regeneration should occur to assure adequate stocking within five years of final harvest.

G. Water, Soil, and Air

1. Management activities shall be designed to minimize soil disturbance and maintain or enhance long-term soil productivity, and shall meet regional watershed condition standards (see FSM 2520.2, Region 6 Supp. #50).
2. Detrimental soil conditions should not exceed 20 percent of the total acreage within the timber sale activity area, including landings and system roads. Restoration treatments should be implemented if detrimental conditions are 20 percent or more of the activity area. Detrimental soil conditions include, but are not limited to, compaction, puddling, displacement, and severely burned soil.
3. State requirements shall be complied with in accordance with the Clean Water Act for protection of waters of the State of Washington (Washington Administrative Code, Chapters 173-201 and 202) through planning, application, and monitoring of Best Management Practices (BMPs) in conformance with the Clean Water Act, regulations, and Federal guidance issued thereto.

In cooperation with the State of Washington, the Forest shall use the following process:

- a. Select and design BMPs based on site-specific conditions, technical, economic, and institutional feasibility, and the water quality standards for those waters potentially impacted.
- b. Implement and enforce BMPs.
- c. Monitor to ensure that practices are correctly applied as designed.
- d. Monitor to determine the effectiveness of practices in meeting design expectations and in attaining water quality standards.
- e. Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMPs do not perform as expected.
- f. Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level. Evaluate the appropriateness of water quality criteria for reasonably assuring protection of beneficial uses. Consider recommending adjustment of water quality standards.

For a more complete explanation of the above, refer to Appendix J, "Best Management Practices."

4. Rehabilitation projects should be monitored and, when necessary, appropriate mitigation measures should be taken.
5. Individual analysis should be made for each proposed management activity involving small domestic water sources. This analysis may result in mutual cancellation of an existing permit, moving a water system intake, use of special (mitigating) practices, or disapproval of the proposed activity.
6. In watersheds where project scoping identifies an issue or concern regarding the cumulative effects of activities on water quality or stream channels, a cumulative effects assessment shall be made using the Olympic National Forest water quality cumulative effects model. The analysis should include land in all ownerships in the watershed. Activities on National Forest land in these watersheds should be dispersed in time and space to the extent practical, and at least to the extent necessary to meet management requirements. For intermingled ownerships, scheduling efforts should be coordinated to the extent practical.
7. Unstable road sidecast material should be removed where necessary to prevent slope movement that would cause significant adverse effects on downslope resources or stream channels.
8. Vegetation needed to preserve soil and water values should be protected from adverse effects from logging activities, broadcast burning, road management and maintenance, and other management activities.
9. A State water right shall be obtained for water uses, with the exception of activities covered by the reservation principal (watershed protection and timber management activities).
10. Air quality standards for Olympic National Forest and the State of Washington are established in the Washington State Implementation Plan.

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- a. Management activities within the Forest shall be planned to maintain air quality at a level which meets or exceeds applicable Federal and State standards and regulations.
- b. The Forest shall coordinate its activities with the appropriate air quality regulatory agencies.
- c. The Forest should demonstrate reasonable progress in reducing total suspended particulate (TSP) emissions from prescribed burning.
- d. Consideration should be given to using the mitigating measures listed in the FEIS to the Pacific Northwest Regional Guide for reducing emissions from prescribed burning.

H. Minerals, Energy, and Geology

1. Under the mining laws, prospectors and miners have a right of access into National Forest land. Access and operations which might cause disturbance of surface resources shall be analyzed in response to a proposed operating plan. A decision on approval of reasonable access shall be made as a result of appropriate environmental analysis.
2. Operating plans and permits shall contain provisions for environmental protection and for timely and effective reclamation.
3. Mineral lease applications should be reviewed in a timely fashion. Conditions necessary to protect surface resources shall be provided to the Bureau of Land Management.
4. Appropriate special stipulations to oil and gas leases shall be recommended to the Bureau of Land Management when determined necessary to protect the surface resources and/or to meet the Desired Future Condition of the management area(s) involved.
5. A "no surface occupancy" stipulation shall be recommended only: (1) when surface occupancy would cause significant resource disturbance which cannot be mitigated by any other means; (2) where resource impacts would be irreversible or irretrievable; or (3) where the activity is incompatible with the surface management Goal and Desired Future Condition of the management area(s) involved.
6. Saleable mineral material sources (rock pits) shall be rehabilitated to the extent feasible as development progresses. Final rehabilitation shall be completed after final entry.
7. All saleable, locatable, and leasable mineral activity should be avoided within the foreground of sensitive travel routes, water bodies, and developed recreation sites. When analysis shows that this is not feasible, the activity should be designed and implemented to meet the Visual Quality Objectives of the area.
8. All saleable, locatable, and leasable mineral activity, and development of all hydropower projects, should be compatible with the Goal and Desired Future Condition of the management area in which it is located.
9. Proposals for hydropower uses shall require an environmental assessment and coordination with the Federal Energy Regulatory Commission (FERC). For approved projects, emphasis shall be placed upon minimizing the impact on resources.

I. Human and Community Development

1. The public, including minorities and the physically challenged, shall be informed of the availability of Forest programs and opportunities.
2. The Forest shall involve American Indians in Forest planning processes.
3. If during the scoping phase for project analyses it is determined that American Indian rights are an issue, the potentially affected tribes should be involved in the project planning process.
4. The Treaty rights and privileges of affected Indian tribes shall be considered and appropriately provided for in all Forest activities. Information about proposed project activities should be shared with tribal groups whose traditional religious practices, sites, or resources may be affected.
5. Forest activities and programs shall be conducted in such a manner as to protect and preserve the rights (as defined by the American Indian Religious Freedom Act) of American Indians to exercise their traditional religions and freedom to worship through ceremonies and traditional rites, including access to sites and use and possession of sacred objects.
6. Old-growth cedar should be made available for traditional American Indian cultural and religious uses. The supply of large, old-growth cedar trees shall be monitored to assure that this resource will remain available in perpetuity.

J. Lands

1. Special use of National Forest land may be authorized when such use cannot reasonably be accommodated on private land. In considering special use applications, the interests and needs of the general public shall be given priority over those of the applicant. Use should be compatible, and in harmony with, the surrounding landscape.
2. When issued or renewed, special use permits should be consistent with the Goal and Desired Future Condition for each Management Prescription.
3. Existing nonconforming, incompatible, or inappropriate uses should be terminated on an opportunity basis.
4. Unless specifically exempted by regulation, all private special uses of National Forest land should be authorized on a charge basis.
5. Applicants may be required to furnish necessary environmental analysis, surveys, plats, drawings, etc., and provide funds for the processing and administration of permits.
6. Special use authorizations for use or development of sites and facilities should emphasize:
 - a. The utilization of existing capacities at approved sites.
 - b. Competitive processes for interest by multiple applicants.
 - c. Preparation of environmental analysis, master plans, site charters, surveys, and site development plans.

- d. That land and other resources committed must be suitable for the proposed use.
- e. That encumbrances on National Forest land should be kept to the minimum area and duration possible.
- 7. The Forest may grant needed easements to State and local governments for proposed, existing, and relocated roads and highways.
- 8. The Forest should coordinate with intermingled and adjacent landowners, plus State and local governments, in developing roads and trails that serve the needs of all parties. Where appropriate, the Forest should acquire rights-of-way or enter into/continue existing cost-share agreements in order to support resource management objectives.
- 9. The Forest shall grant access to private property in accordance with Federal regulations and standards. Rights-of-way may be granted through easement or permit where appropriate to provide access to adjacent private land.
- 10. New transportation/utility proposals or expansion of existing utility systems should be accommodated within existing corridor systems to the maximum extent feasible. Additional corridors needed for utilities or highways shall be assessed through an interagency environmental analysis and in consultation with industry and interest groups.
- 11. Lands may be acquired and disposed of through exchange or other means to support resource and management objectives, and to resolve encroachment where applicable.
- 12. Boundaries should be surveyed and posted where such action will assist in the administration of National Forest lands, and/or protect existing survey corners or references when probability of disturbance exists.

K. Facilities

- 1. Erosion prevention measures shall be in place, both during and following road construction, prior to seasonal run-off.
- 2. Vegetative cover on cuts and fills should be maintained.
- 3. Stabilized road ditches should not be disturbed by road maintenance unless necessary to maintain drainage. Side-casting shall be avoided except at designated locations.
- 4. Roads shall be planned, designed, constructed, and maintained to minimize impacts on the land and resources, considering economics and user safety.
- 5. Roadside vegetation may be controlled using a variety of methods determined by an analysis of the size of vegetation, economics, traffic safety, and resource impacts, as described in a project-specific environmental analysis.
- 6. Transportation system planning should incorporate state-of-the-art design and location criteria to minimize long-term costs and impacts on resources. Road location and logging systems analysis should be conducted in an interdisciplinary manner.

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- a. Road management objectives should be used to provide a road sufficient to carry the anticipated traffic load with reasonable safety after geotechnical and economic analyses have been made.
 - b. Potential road locations identified as having high instability should be avoided.
7. Signing necessary for traffic information and user control should be pertinent to the intended use, the road objectives, and the conditions.
8. Sound road management objectives should be applied Forest-wide. It may not be desirable or cost-effective to plan for full maintenance of the entire "open system." Rather, management must be consistent with the resource management objectives.
9. Forest development roads shall be managed with a mix of prescriptions to accomplish management objectives and to reduce user conflicts.
 - a. Roads may be made available or restricted for different user groups at different times.
 - b. Roads shall not be used if their use causes damage to the road or unacceptable impacts to adjacent resources (36 CFR 261). Damage is exclusive of normal wear and tear correctable by maintenance activities.
 - c. Use of Forest development roads by commercial users requires a permit, contract provision, easement deed, or other written authorization (36 CFR 212 and CFR 261).
10. Base decisions to block or close roads on the following criteria:
 - a. Expected need or use, including postsale potential.
 - b. Need to provide planned recreation experience opportunities.
 - c. Need to protect critical habitat.
 - d. Need to protect or reduce impact on wildlife and fish habitat.
 - e. Need to protect soil and water.
 - f. Need to protect the facility.
 - g. Safety of expected users.
 - h. Economics of road maintenance.
11. Projects should be identified and implemented to correct road-related problems that are adversely impacting the road and/or other resources.
12. Each Forest development road should have entrance information that communicates to the Forest visitor the road conditions and purpose of the road.
13. Trail density, trail and trailhead location, and road maintenance levels should be consistent with the Desired Future Condition of the management area(s) involved and the management intensi-

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ties to be applied. All trails should be protected. Trails that are damaged by management activities should be restored or replaced.

14. Ditch relief culverts should be sized, spaced, located, and maintained to minimize sedimentation to streams.
15. Water systems for campgrounds and administrative facilities shall be operated, maintained, and/or upgraded in a manner which complies with applicable public laws. Systems which do not meet public health standards and requirements shall immediately be corrected or closed.
16. Trail closures to a particular use shall be based on the following guidelines:
 - a. Motorized Vehicles:
 - 1) A trail shall be closed to motorized vehicles when:
 - a) Trail is inside Wilderness (see Wilderness Act, Sec. 4 (c)).
 - b) Use by motorized vehicles is causing, or will cause, adverse effects on the resources or other forest visitors (see 36 CFR 295.2 (a)).
 - c) It is necessary to protect the Wild, Scenic, or Recreational values for which a river area was designated in the Wild and Scenic Rivers system (see Wild and Scenic Rivers Act, Sec. 10 (a)).
 - 2) A trail may be closed to motorized vehicles when:
 - a) Trail enters either Wilderness or Park from the trailhead.
 - b) The entire length of trail is less than 3.0 miles and is a dead end (MVs could not continue on via a road or another trail).
 - c) Trail is managed as a pedestrian nature/interpretive trail.
 - d) Trail management objective is aimed at managing a trail for specific uses other than motorized vehicles.
 - b. Pack and Saddle Stock:
 - 1) A trail may be closed to pack and saddle stock when:
 - a) Trail is managed as a pedestrian nature/interpretive trail.
 - b) Use by pack and saddle stock is causing, or will cause, adverse effects on the resources or other forest visitors.
 - c) Entire length of trail is less than 3.0 miles and is a dead end (stock could not continue on via a road or another trail).
 - d) Trail management objective is aimed at managing a trail for specific uses other than pack and saddle stock.

c. Mountain Bicycles:

1) A trail shall be closed to mountain bicycles when:

- a) Trail is inside Wilderness (see Wilderness Act, Sec. 4 (c)).

2) A trail may be closed to mountain bicycles when:

- a) Trail enters either Wilderness or Park from trailhead.
- b) Trail is managed as a pedestrian nature/interpretive trail.
- c) Use by mountain bicycles is causing, or will cause, adverse effects on the resources or other forest visitors.
- d) Trail management objective is aimed at managing a trail for specific uses other than mountain bicycles.

L. Protection

1. The fire protection and fire use program shall be cost-effective and responsive to land and resource management objectives.
2. All wildfires shall receive timely suppression response with appropriate forces, and with a strategy of either one, or a combination of, the alternatives of confinement, containment, or control. The public should be informed about the philosophy of fire management policy. Fire suppression strategies may vary depending on fire intensities, resource value priorities, the values at risk, and fire behavior (predicted and observed).
3. An "Escaped Fire Situation Analysis" shall be prepared for wildfires that escape initial action and threaten to exceed established limits. This analysis weighs the cost of suppression against the potential change in resources. Suppression actions should be appropriate for the values threatened.
4. Resource value priorities for protection shall be:
 - a. Life and property.
 - b. Soil productivity and water quality.
 - c. Threatened, endangered, and sensitive species habitat.
 - d. Fish and wildlife habitat.
 - e. Timber investments.
 - f. Air quality.
5. The National Fire Management Analysis System shall be utilized to determine the most cost-efficient fire protection organization. As conditions change and better information is developed, the fire organization shall be reevaluated with this system.

FOREST-WIDE STANDARDS AND GUIDELINES BY PROGRAM ELEMENT

6. Cost-effective plans for the prevention of human-caused fires shall be aimed at specific risks to be determined by ongoing monitoring of current and recent fire reports.
7. Equipment and training shall be provided to USDA Forest Service employees outside of the Fire Management organization to assist in initial attack and other fire suppression duties and positions.
8. Minimum monitoring requirements for fire protection should include: (1) Actual cost by individual fire, and (2) estimated fire effects on resource values for Class C and larger fires. The primary reporting document shall be the Individual Fire Report (5100-29, Revised).
9. Fuels management shall utilize the National Fire Management Analysis System and Fuels Appraisal System to determine the level of treatment required for fire protection purposes. As conditions change and better information is developed, fuels managers shall adopt it.
10. Levels and methods of fuels treatment shall be guided by the protection and resource objectives of the management area. Prescribed burning should be the least-preferred method. Treatment methods that reduce emissions should be emphasized. Emphasis should be on intensive utilization of wood residues, using a marketing strategy to reduce fuel loadings not needed for other resources.
11. Prescribed fire may be utilized to meet management objectives and maintain fuel profiles in appropriate ecosystems.
12. Prescribed fire plans shall be prepared in advance of ignition and approved by the appropriate line officer for each prescribed fire.
13. Maintenance of air quality shall be emphasized when planning prescribed fire use. Practical means of smoke management (reduction, avoidance, and scheduling) shall be employed. All burning shall be planned and conducted in accordance with State smoke management plans.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

In addition to Forest-wide Standards and Guidelines, which apply to all Forest lands, the following standards and guidelines are applicable to specific management areas on the Olympic National Forest. The Management Prescriptions and their associated standards and guidelines are detailed on the following pages. Refer to the management area allocation map for the Preferred Alternative (Alternative C-Preferred (Modified)) which accompanies the FEIS. The detailed control map for the Forest Plan allocations resides in the Forest's computerized Geographic Information System (GIS). This control map is available for review in the Olympic National Forest Supervisor's Office.

If unusual or special circumstances inconsistent with direction for a given management area are discovered, the management area boundary or direction may be modified. Such a modification would be the exception rather than the rule. An example would be the discovery of a bald eagle nesting site within an allocation such as E1-Timber Management. In this case, the site would be redesignated as C3-Bald Eagle Management Area. Boundaries would be modified through the NEPA process to determine what, if any, documentation is needed. Minor modifications to correct mapping errors may be made without modifications to the Forest Plan.

Table IV-20, on the following page, displays the management area allocations associated with the Forest Plan.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

Table IV-20. Management Area Allocations 1/

Management Area	Forest Plan Allocation Acreage
A1A - Undeveloped Rec. (Non-Motorized)	34,500
A1B - Undeveloped Rec. (Motorized)	6,100
A2 - Scenic	38,200
A3 - Developed Rec. & Admin. Sites	1,100
A4A - Wild, Scenic & Rec. Rivers	1,800
A4B - River Corridors	17,300
B1 - Wilderness	88,300
C1 - SOHAs	75,700
C2 - Woodpecker/Marten Habitat Areas	4,500
C3 - Bald Eagle Management Areas	1,200
E1 - Timber Management 2/	325,700
F1 - Municipal Watersheds	33,200
F2 - Riparian Areas 3/	--
J2 - Research Natural Areas	1,524
J3 - Botanical Areas	3,200
TOTAL NATIONAL FOREST ACRES	632,324

1/ All figures are mutually exclusive, e.g. A4A, J2, J3, etc. within Wilderness (B1) are reported only as B1. Generally, the acres are reported for the management area felt to be the most restrictive.

2/ Contains some riparian area, some constrained visual areas, and some unsuitable timberland. Other acres within E1 may prove to be not cost effective for meeting the objectives of this Plan.

3/ The 177,050 acres of Riparian Area are distributed across the Forest and are included in the acreage for the other management areas. Constraints are placed on management of these acres when necessary to achieve Riparian Area protection objectives.

MANAGEMENT PRESCRIPTION A1A - UNDEVELOPED RECREATION (NON-MOTORIZED)

GOAL: Provide a variety of undeveloped recreation opportunities in areas characterized by a predominantly natural or natural-appearing environment in a Primitive or Semi-Primitive setting where motorized use is prohibited.

DESIRED FUTURE CONDITION: A natural or natural-appearing environment has been maintained. Campsites, sanitation facilities, and other management activities are not conspicuous. The area affords visitors an experience mostly free from the sights and sounds of other people. Recreation management should be consistent with criteria for Recreation Opportunity Spectrum (ROS) classes Primitive and Semi-Primitive Non-Motorized as described in the ROS User's Guide.

APPLICABLE NATIONAL FOREST AREAS: This prescription is applied to selected areas that have a natural or natural-appearing environment with undeveloped recreational attributes. The area provides opportunities to practice a variety of outdoor skills in a challenging environment. These areas provide non-motorized recreation opportunities such as fishing, hunting, berry picking, hiking, backpacking, mountain climbing, and horseback riding.

MANAGEMENT INTENSITIES:

1. Primitive ROS Class
2. Semi-Primitive Non-Motorized ROS Class

STANDARDS AND GUIDELINES:

A. Recreation

1. Motorized vehicles should not be permitted except under the following management situations: aerial fish stocking, habitat improvement, trail maintenance, construction, and reconstruction, transporting facilities necessary for public safety and health, and emergency situations involving search and rescue and firefighting.
2. Site modification for facilities should be very minimal to none, and the site development should be level 2 or less.
3. Recreation facilities, such as toilets, trail shelters, signs, and fire rings, should be designed, constructed, and maintained as primitive and rustic facilities, utilizing native materials and colors when and where possible.
4. The trail system should be designed and managed to disperse use to sites that are suitable for overnight camping and/or offer interesting day-use opportunities.
5. Undeveloped campsites should be located and maintained so that less than three campsites are visible from any other in the Primitive ROS areas and less than six campsites are visible from any other in the Semi-Primitive ROS areas.
6. Resource management activities shall follow the Visual Management System guidelines in order to protect scenic values.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

B. Timber

1. Timber is not available for programmed harvest.
2. Timber harvest may take place when resource management goals identify it as a management tool to enhance other resource values such as wildlife habitat improvements, trail construction, recreation, and helispots. Timber harvest may be allowed in catastrophic situations such as fire, blowdown, or insect and disease outbreaks when consistent with the Desired Future Condition. Aerial or full-suspension yarding systems are preferred. Restoration of such an area will be designed to eventually return it to its natural state.
3. When timber harvesting is prescribed, an environmental analysis, with an appropriate environmental document approved by the responsible Line Officer, shall be prepared.
4. Scheduled timber harvest activities outside of the area may extend right up to the management area boundary.
5. New roads constructed within one-half mile of the management area boundary should be managed to minimize the impact on the recreation experience within the management area.

C. Minerals and Energy

Development of saleable mineral sites and hydroelectric power projects should not be permitted. Where approved, development and operating plans must contain provisions to mitigate factors which conflict with the Goal and Desired Future Condition of the area.

D. Facilities

1. Facilities should be kept to a minimum, but provided when needed for access, resource protection, safety, and habitat improvement. As a setting norm, no roads should be constructed. However, low volume traffic access may be constructed to provide access to sites, such as mining claims, when the setting criteria can be achieved.
2. Facilities should be designed, constructed, and maintained to be compatible with the characteristic landscape by utilizing native materials and harmonious color schemes when and where possible.
3. Trail design, construction, and maintenance should be consistent with the ROS class and the trail management objective. Trail grades and standards should be varied to provide planned levels of experiences.
4. Facilities should not be constructed within meadows.
5. Project planning, design, and the operation and maintenance of facilities, such as trailhead parking lots, trails, and trail facilities, should be aimed at limiting user encounters.
6. Development of utility corridors should not be permitted.
7. Brush treatment methods that minimize visual impacts should be used in the foreground along Sensitivity Level 1 and 2 travel routes and use areas.

E. Protection

1. Fuels created by project activities should be treated to meet fire hazard standards based on resource values at risk.
2. Heavy equipment may be used to construct fire lines where the overall effects of the fire and its suppression on the environment will be reduced. A Resource Advisor should advise the Incident Commander of techniques required to reduce impacts of equipment use and provide advice on rehabilitation of impacted areas and facilities. Any facility damaged while constructing fire lines shall be restored.
3. For moderate to high intensity wildfire (flame length over two feet), the appropriate response (strategy) should be *Control* and *Contain*.

MANAGEMENT PRESCRIPTION A1B - UNDEVELOPED RECREATION (MOTORIZED)

GOAL: Provide a variety of undeveloped recreation opportunities in areas characterized by a predominantly natural or natural-appearing environment in a Semi-Primitive setting where motorized use may be permitted.

DESIRED FUTURE CONDITION: An essentially natural or natural-appearing environment has been maintained. Campsites, sanitation facilities, and other management activities are not conspicuous. The area generally affords the visitor an experience mostly free from the sights and sounds of large numbers of recreationists. Recreation management should be consistent with criteria for Recreation Opportunity Spectrum (ROS) class Semi-Primitive Motorized as described in the ROS User's Guide.

APPLICABLE NATIONAL FOREST AREAS: These areas consist of a natural or natural-appearing environment. They provide opportunities to practice a variety of outdoor skills in a challenging environment. They provide motorized recreation opportunities along roads, and they may provide motorized recreation opportunities on trails. These areas will also provide non-motorized recreation opportunities, such as hunting, fishing, hiking, backpacking, and mountain climbing.

MANAGEMENT INTENSITIES: Semi-Primitive Motorized (SPM).

STANDARDS AND GUIDELINES:

A. Recreation

1. Motorized vehicles may be permitted on roads and specified trails. Some trails may be closed to motorized vehicles.
2. Recreation facilities, such as toilets, trail shelters, signs, and fire rings, should be designed, constructed, and maintained as primitive and rustic facilities, utilizing native materials when and where possible.
3. Undeveloped campsites should be located and maintained so that less than six campsites are visible from each other.
4. Resource management activities shall be guided by the Visual Management System in order to protect the scenic values.

B. Timber

1. Timber is not available for programmed harvest.
2. Timber harvest may take place when resource management goals identify it as a management tool to maintain or enhance other resource values such as wildlife habitat improvements, trail construction, recreation, and helispots. Timber harvest may also be allowed in situations, such as catastrophic fire, blowdown, or insect and disease outbreaks, when consistent with the Desired Future Condition. Aerial or full-suspension yarding systems are preferred. Restoration of such an area will be designed to eventually return it to its natural state.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

3. When timber harvesting is prescribed, an environmental assessment shall be prepared and approved by the responsible Line Officer.
4. Scheduled timber harvest activities outside of the area may extend up to the management area boundary.
5. New roads constructed within one-half mile of the management area boundary should be managed to minimize the impact on the recreation experience within the management area.

C. Minerals and Energy

Development of saleable mineral sites and hydroelectric power projects should not be permitted. Where approved, development and operating plans must contain provisions to mitigate factors which conflict with the Goal and Desired Future Condition of the area.

D. Facilities

1. Facilities should be kept to a minimum but provided when needed for access, resource protection, safety, and habitat improvement.
2. Facilities should be designed, constructed and maintained to be compatible with the characteristic landscape by utilizing native materials and harmonious color schemes when and where possible.
3. Trail design, construction, and maintenance should be consistent with the ROS class and the trail management objective. Trail grades and standards should be varied to provide planned levels of experience.
4. Development of utility corridors should not be permitted.
5. Facilities should not be constructed within meadows.
6. Brush treatment methods that minimize visual impacts should be used in the foreground along Visual Sensitivity Level 1 and 2 travel routes and use areas.

E. Protection

1. Fuels created by project activities should be treated to meet fire hazard standards based on resource values at risk.
2. Heavy equipment may be used to construct fire lines where the overall effects of the fire and its suppression on the environment will be reduced. A Resource Advisor should advise the Incident Commander of techniques required to reduce impacts of equipment use and provide advice on rehabilitation of impacted areas and facilities. Any facility damaged while constructing fire lines shall be restored.
3. For moderate to high intensity wildfire (flame length over two feet), the appropriate response (strategy) should be *Control* and *Contain*.

MANAGEMENT PRESCRIPTION A2 - SCENIC

GOAL: To manage specific landscapes in such a manner that their scenic values are protected, maintained, and/or enhanced as viewed from major travel routes, use areas, or water bodies. To develop interdisciplinary Viewshed Schedules that provide management direction aimed at meeting the Desired Future Condition.

DESIRED FUTURE CONDITION: Landscapes are providing pleasing scenery as viewed from travel routes, use areas, and water bodies. These landscapes will accommodate management activities that are not evident, or are visually subordinate to the natural landscape, when viewed by casual forest visitors.

APPLICABLE NATIONAL FOREST AREAS: This prescription is applied to selected viewsheds that involve sensitive landscapes due to their visibility from major travel routes and recreation areas.

MANAGEMENT INTENSITIES: Two intensities are identified for this prescription:

1. Retention
2. Partial Retention

STANDARDS AND GUIDELINES:

A. Recreation

Visual Quality Objectives shall be met. Exceptions may be allowed in the case of facility development in foreground areas (see "D" below). Key references for this prescription shall be volumes 1 and 2 of the Visual Management System.

B. Timber

1. Timber harvesting shall be programmed when compatible with the Desired Future Condition.
2. Activities should be designed to mitigate and rehabilitate unacceptable visual impacts due to past timber management activities that do not meet Visual Quality Objectives.
3. Reforestation site preparation methods which minimize visual disturbance should be used in the foreground along Sensitivity Level 1 and 2 travel routes, water bodies, and developed recreation sites.
4. As part of the Viewshed Schedules, management direction shall be developed by an interdisciplinary team, including a landscape architect and silviculturist.
5. For each management activity proposed within a given viewshed, site-specific management prescriptions shall be developed by an interdisciplinary team, including a landscape architect and silviculturist.

C. Minerals and Energy

Common mineral material sources shall not be developed within the visible foreground.

D. Facilities

Facilities, such as roads, trails, buildings, utility structures and corridors, fuel breaks, etc., may be developed in the foreground to facilitate the management of adjacent areas. However, their construction, reconstruction, and maintenance shall be designed to meet the Visual Quality Objectives and/or minimize their dominance upon the natural landscape. Key references are in volume 2 of the Visual Management System (Chapter 2, Utilities; Chapter 3, Range; Chapter 4, Roads; Chapter 6, Fire; and Chapter 8, Recreation).

E. Protection

1. Fire suppression techniques should minimize visual impacts. Heavy equipment may be used to construct fire lines where the overall effects of the fire and its suppression on the environment will be reduced. A Resource Advisor shall advise the Incident Commander of techniques required to reduce impacts of equipment use. The Resource Advisor shall also provide advice on rehabilitation of impacted areas.
2. Pest suppression methods should minimize visual disturbances.
3. Catastrophic occurrences may warrant a departure from the Visual Quality Objectives. However, mitigating measures should be implemented to reduce visual impacts and to restore the natural character of the landscape.
4. Brush treatment methods that minimize visual impacts should be used in the foreground along Sensitivity Level 1 and 2 travel routes and use areas.
5. For moderate to high intensity wildfire (flame length over two feet), the appropriate response (strategy) should be *Control*.

MANAGEMENT PRESCRIPTION A3 - DEVELOPED RECREATION SITES AND ADMINISTRATIVE SITES

GOAL: Provide readily accessible, appropriately designed facilities for concentrated use by people seeking a convenient recreational experience, employees performing duties, and visitors seeking information.

DESIRED FUTURE CONDITION: Roads, buildings, ramps, bulletin boards, tables, and other physical facilities are evident, but their design and construction should be harmonious with the color, shapes, and lines of the surrounding environment and consistent with ROS class. Openings usually exist or may be created to: 1) Accommodate facilities, provide scenic views, or meet vegetative management goals within the developed site; and 2) accommodate facilities and space requirements for administrative sites.

APPLICABLE NATIONAL FOREST AREAS: Developed recreation sites include existing and proposed campgrounds, picnic areas, resorts, swimming and boating sites, recreational residence tracts, and trailheads. Developed recreation sites are usually close to water bodies or other scenic or special interest environments. Access is usually by road but may be by trail or water. Administrative sites include, but are not limited to, ranger stations, work centers, residential sites, and guard stations.

MANAGEMENT INTENSITIES:

1. Rural ROS Class
2. Roaded Natural/Modified ROS Class
3. Semi-Primitive Motorized ROS Class
4. Semi-Primitive Non-Motorized ROS Class

STANDARDS AND GUIDELINES:

A. Recreation

1. Developed sites should be provided in Rural through Semi-Primitive Non-Motorized settings, with major emphasis on development within the Roaded Natural/Modified ROS class.
2. Recreation sites should range from primitive to highly developed, with an emphasis on moderately developed sites.
3. Special facilities at selected sites should be provided for the convenience of elderly, young, or physically challenged visitors. This would apply to Rural and Roaded Natural/Modified ROS classes only.
4. Development of new developed and administrative sites and reconstruction of existing sites shall meet the following guidelines:

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

- a. As per an approved Site Development Plan.
 - b. Based on projected demands and past trends.
 - c. Provides for public and employee safety and sanitation.
 - d. Meets long-term maintenance, protection, and enhancement objectives of on-site resources and facilities.
5. Operation and maintenance of developed sites should be guided by the following:
 - a. Forest Service policy and Developed Site Management Schedule.
 - b. Cost-effective management.
 6. Recreational residence numbers shall not exceed the present level. Permits to be phased out should be identified at least 10 years prior to scheduled date.
 7. Recreation residence lots should not be reoffered if the current permit is abandoned.
- B. Wildlife and Fish
1. Emphasis should be toward the maintenance and enhancement of the shellfish habitat at Seal Rock Campground.
 2. Protection of existing developed sites should be a higher priority than the protection of onsite fish habitat.
 3. Opportunities for visitors to view fish and wildlife may be provided.
- C. Range
- Grazing shall not be allowed.
- D. Timber
1. Timber is not available for programmed harvest.
 2. Vegetation should be managed as prescribed in a Vegetative Management Schedule for each site. Priorities will be to:
 - a. Reduce risk of public injury and facility damage from hazardous trees and other vegetation. Reduce risk vegetation only until a Vegetative Management Schedule is approved.
 - b. Maintain or enhance the natural character associated with the recreational experience of developed sites and the landscape associated with administrative sites.
- E. Water, Soil, and Air
1. Water rights shall be acquired from the State of Washington for all sources supplying or expected to supply water to a recreation site. This water must meet requirements of the Department of Ecology for surface or ground water usage.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

2. Sewage effluent from campgrounds, administrative sites, and other developed areas shall be disposed of in a manner which will prevent the contamination of surface or ground water.

F. Minerals and Energy

1. Development of common variety aggregate sources shall be prohibited.
2. Developed recreation and administrative sites shall be withdrawn from mineral entry.
3. Hydropower developments may be allowed only if developed sites lost as a result will be replaced with equal or better facilities by the hydropower developer.

G. Facilities

1. The transportation system, recreation facilities, and utility structures and corridors within developed recreation sites should be designed, constructed, and maintained to meet the recreation objectives, Visual Quality Objectives, and planned experience level set for the site.
2. Trails should be designed, constructed, and maintained to maximize the recreation experience consistent with the ROS class and the trail management objective. Trail grades and standards may be varied to provide planned levels of experiences.
3. The transportation system, buildings, utility systems, and other related facilities should be planned, developed, maintained, and operated for safe use, support of Forest resource programs, and cost-effectiveness.
4. The location and construction of new buildings, roads and parking lots, and additions to existing buildings and utility systems, as well as any land alteration, shall comply with the approved site development plan and meet approved standards.
5. Designs for construction of new buildings and reconstruction of existing buildings should be developed with consideration of access for the physically challenged.
6. Administrative facilities management and maintenance should be guided by the following priorities:
 - a. Public and employee safety and health.
 - b. Prevention of site and interior and exterior building deterioration.
 - c. Forest Service identity and Good Host image.
 - d. Energy conservation.
 - e. Access for the physically challenged.
 - f. Minor improvements.

H. Protection

1. Use of heavy equipment to control fires may be allowed if it reduces total impact on the recreation site. Rehabilitation of impacted areas shall be initiated within four weeks of impact.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

2. Recreation sites should not be used as fire camps.
3. Fuel break construction should be integrated with vegetative management projects.
4. A thorough hazard tree survey shall be conducted annually. Trees determined to be an existing hazard shall be removed.
5. All inventoried proposed developed recreation sites shall be administered to protect and retain their natural character and recreation values for future development.
6. Brush control methods that minimize visual impacts should be used in and around developed sites, such as along roads, camping spurs, trails, and around structures and signs.
7. For moderate to high intensity wildfire (flame length over two feet), the appropriate response (strategy) should be *Control*.

MANAGEMENT PRESCRIPTION A4A - WILD, SCENIC, AND RECREATIONAL RIVERS

GOAL: These rivers are recommended for inclusion within the National Wild and Scenic Rivers System. The lands within the river corridors will be managed to retain their existing Wild, Scenic, and Recreational values.

DESIRED FUTURE CONDITION:

Wild Rivers: Generally are inaccessible by road but may be reached by trail or water. Vegetation is varied in size, species, and age and is predominantly the product of natural succession. Good opportunity is provided to interact with a natural environment, away from the sights and sounds of other people. A high degree of challenge may be offered. Rivers are free flowing and free of impoundments and diversions.

Scenic Rivers: Some structures, farming, and evidence of timber harvest may be visible, but the shorelines are largely natural-appearing and undeveloped. The forest appears natural as viewed from the river and riverbank. The rivers are accessed in some places by road, and in some instances roads may occasionally reach or bridge the river. A challenging interaction with the natural environment is generally available. Rivers are free flowing and free of impoundments and diversions.

Recreational Rivers: Visitors may reach the river by road, trail, or boat. Considerable development and timber harvest may have occurred near the river, but the area is managed to protect recreational values. Parallel roads may exist on one or both sides of the river. Visitors are likely to share their recreational experience with other individuals or groups. Some previous diversions or low dams may exist.

APPLICABLE NATIONAL FOREST AREAS: Those rivers having the values needed to be considered for Wild, Scenic, or Recreational classification. For planning purposes, a corridor is considered to extend a distance of one-quarter mile on each side of a river channel.

MANAGEMENT INTENSITIES:

1. Wild
2. Scenic
3. Recreational

STANDARDS AND GUIDELINES:

A. Recreation

1. Wild Rivers
 - a. Within the river corridor, the Visual Quality Objective of Preservation shall be met.
 - b. Outside the river corridor, but within the area seen from the river, Visual Quality Objectives should be met as determined by the Visual Management System.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

- c. Recreation management should provide Primitive and Semi-Primitive Non-Motorized opportunities.
 - d. Recreation sites may be provided, and shall be limited to, simple comfort and convenience facilities.
 - e. Motorized travel should not be permitted in Wild river corridors, except for administrative use and where there is a past history of significant use.
 - f. Trails may be developed but should be located and constructed to be unobtrusive from the river or riverbank.
 - g. Recreation special uses may be approved for the purpose of providing a river-oriented recreation experience if it is consistent with the Desired Future Condition.
 - h. Outfitter and guide services will be permitted at a level which is consistent with the management objectives of the river.
2. Scenic Rivers
- a. Within the river corridor, the Visual Quality Objectives of Retention and Partial Retention shall be met.
 - b. Outside the river corridor but within the area seen from the river, Visual Quality Objectives should be met as determined by the Visual Management System.
 - c. Recreation management should provide Semi-Primitive and Roaded Natural opportunities.
 - d. Recreation sites may be established in close proximity to the river but shall be widely spaced, blend with the natural landscape, and be screened from the river.
 - e. Motorized travel may be permitted within Scenic river corridors where compatible with the ROS.
 - f. Trails may be developed but should be located and constructed to be generally unobtrusive from the river or riverbank.
 - g. Recreation special uses may be approved for the purpose of providing a river-oriented recreation experience consistent with the Desired Future Condition.
 - h. Outfitter and guide services will be permitted at a level which is consistent with the management objectives of the river.
3. Recreational Rivers
- a. Within the river corridor, the Visual Quality Objectives of Retention and Partial Retention should be met.
 - b. Outside the river corridor, but within the area seen from the river, Visual Quality Objectives should be met as determined by the Visual Management System.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

- c. Recreation sites may be developed in close proximity to the river and should be for the purpose of providing a river-oriented recreation experience consistent with the Desired Future Condition.
- d. Motorized travel on land and water may be permitted.
- e. Trails may be developed to provide access to and along the river corridor.
- f. Recreation special uses may be approved for the purpose of providing a river-oriented recreation experience.
- g. Outfitter and guide services will be permitted at a level which is consistent with the management objectives of the river.

B. Wildlife and Fish

- 1. Habitat should be managed to maintain 70 percent or more of the area in thermal/hiding cover.
- 2. Structures for improvement of fish and wildlife habitat may be constructed in Scenic and Recreational river corridors, provided they do not affect the free-flowing characteristics of the river and harmonize with the surrounding environment. Major projects within Scenic and Recreational river corridors should be coordinated with the Washington Departments of Wildlife and Fisheries, and with applicable Treaty tribes.

Habitat improvement projects should not be developed within Wild river corridors.

- 3. Large organic debris that enters Scenic and Recreational Rivers should be left in place unless it interferes with or degrades the values for which the river was designated. Large organic debris shall be left within Wild reaches.

C. Timber

- 1. Timber harvest shall not be programmed in Wild river corridors. Harvest may be programmed in Scenic and Recreational river corridors consistent with the assigned river designation and the Desired Future Condition.
- 2. Fuelwood cutting shall not be permitted in Wild river corridors. It may be permitted in Scenic and Recreational river corridors.
- 3. Large woody material should be retained for fish or wildlife habitat needs.

D. Soil and Water

Watershed improvements should be undertaken where deteriorated soil or hydrologic conditions:

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

1. Create a threat to the values for which the river is managed;
2. Present a definite hazard to life or property; or
3. Could cause serious depreciation of important environmental qualities outside the river area.

Rehabilitation and stabilization projects should retain the natural appearance of the area, harmonize with the environment, and have no adverse effect on the river or its environment.

E. Minerals and Energy

1. Common mineral material sources shall not be developed in Wild river corridors and should not be developed in Scenic or Recreational river corridors.
2. New hydropower projects shall not be permitted on any designated or recommended river. Existing dams should be phased out as the opportunity presents itself.
3. Wild river corridors should be withdrawn from mineral entry.

F. Lands

1. National Forest land within Wild, Scenic, and Recreational river corridors should be retained.
2. Non-Federal lands within Wild, Scenic, and Recreational river corridors may be acquired as the opportunity or need occurs if the land becomes available.

G. Facilities

1. Roads shall not be permitted in Wild river corridors.
2. The design, construction, and maintenance of facilities, including trail bridges, must be consistent with Wild, Scenic, or Recreational river values and the Desired Future Condition.
3. Utility corridors should not be permitted within Wild river corridors.
4. New overhead utility lines should not be permitted within Scenic and Recreational river corridors. Any development of utility corridors within Scenic and Recreational river corridors should be discouraged.

H. Protection

1. In Wild and Scenic river corridors, heavy equipment should not be used. Heavy equipment may be used in Recreational river corridors.
2. Suppression activities should be modified to maintain the visual quality of the river corridors.
3. For moderate to high intensity wildfire (flame length over two feet), the appropriate response (strategy) should be *Control*.

MANAGEMENT PRESCRIPTION A4B - RIVER CORRIDORS

GOAL: To retain the inherent values of these rivers, and to provide a variety of outdoor recreation opportunities in a pleasing scenic environment while maintaining or enhancing wildlife and fish habitat.

DESIRED FUTURE CONDITION:

Minimum Management Rivers: Generally inaccessible by road, but can be reached by trail or water. Vegetation is varied in size, species, and age and is generally the product of natural succession. The opportunity to interact with a natural environment, generally away from the sights and sounds of other people, is provided. A high degree of challenge may be offered. Rivers are basically free flowing. Low-head dams and diversions, while permitted, are not likely to be found.

Natural Management Rivers: Some evidence of timber harvest and housing may be visible, but the shorelines are generally undeveloped. The forest along the riverbanks generally appears natural when viewed from the river. The rivers are accessed in places by roads. Roads may reach and occasionally bridge the rivers. A challenging interaction with the natural environment is often available. Rivers are generally free flowing. However, limited diversions and low-head dams may be present.

General Management Rivers: The rivers may be reached by road, trail, or boat. Timber harvest may have occurred near the river and be visible from the river and riverbank. The shoreline generally appears natural as viewed from the river. Residential housing and other limited development may be present in the river corridor. Users of the river and adjacent areas are likely to share their recreational experience with other individuals or groups. Some diversions and low-head dams may exist.

APPLICABLE NATIONAL FOREST AREAS: Land adjacent to identified rivers. For planning purposes, a corridor is considered to extend a distance of one-eighth mile on each side of a river channel.

MANAGEMENT INTENSITIES: Three intensities are included.

1. Minimum (A4BM)
2. Natural (A4BN)
3. General (A4BG)

STANDARDS AND GUIDELINES:

A. Recreation

1. Minimum Management Rivers
 - a. Within the river corridor, the Visual Quality Objective of Retention shall be met.
 - b. Recreation sites may be developed which provide Semi-Primitive Non-Motorized opportunities.
 - c. Recreation facilities should be designed, constructed, and maintained as primitive and rustic facilities, utilizing native materials when and where possible.

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- d. Motorized travel should not be permitted within the river corridor, except for administrative use.
 - e. Trails may be developed, but should be located and constructed to be unobtrusive from the river or riverbank. The system should be developed and managed to disperse use to sites that are suitable for overnight camping and/or offer interesting day use opportunities.
 - f. Recreation special uses may be approved for the purpose of providing a river-oriented recreation experience if it is consistent with the Desired Future Condition.
2. Natural Management Rivers:
- a. Within the river corridor, the Visual Quality Objectives of Retention and Partial Retention should be met as seen from the river and riverbank.
 - b. Recreation management should provide Semi-Primitive and Roaded Natural opportunities.
 - c. Recreation sites may be established in close proximity to the river, but shall be widely spaced, blend with the natural landscape, and be screened from the river.
 - d. Motorized travel may be permitted where compatible with the ROS.
 - e. Trails may be developed, but should be located and constructed to provide access for the river user while not being obtrusive as seen from the river.
 - f. Recreation special uses may be approved for the purpose of providing a river-oriented recreation experience consistent with the Desired Future Condition.
3. General Management Rivers:
- a. Within the river corridor, the Visual Quality Objective of Retention or Partial Retention should be met as seen from the river or riverbank.
 - b. Recreation sites may be developed in close proximity to the river, and should be for the purpose of providing a river-oriented recreation experience consistent with the Desired Future Condition.
 - c. Motorized travel on land and water may be permitted.
 - d. Recreation special uses may be approved for the purpose of providing river-oriented recreation experiences.
- B. Wildlife and Fish:
- 1. Habitat should be managed to maintain 70 percent or more of the area in thermal/hiding cover.
 - 2. Major projects within river corridors should be coordinated with the Washington Departments of Wildlife and Fisheries, and with applicable Treaty tribes.
 - 3. Large organic debris that enters these rivers should be left in place unless it interferes with or degrades the river values.

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C. Timber

1. Timber harvest shall not be programmed in corridors managed at the Minimum management intensity. Harvesting can take place in conjunction with salvage under catastrophic conditions (wind, fire, insect outbreak, or disease), provided such activity is used as a tool to maintain or enhance the river corridor management goals. Restoration of such an area will be designed to return it to its desired state.
2. Timber harvest shall be programmed, but must be designed to meet the Desired Future Condition and Goal of the prescription for areas managed with the Natural and General management intensities.
3. Fuelwood gathering may be permitted. Seasonal restrictions may apply.
4. Salvage cutting unit sizes and shapes should vary within a particular area. Factors such as natural openings, distance zones, closeness to the viewer, viewer position, and topography should determine the size, shape, and pattern of proposed units.

D. Minerals and Energy

1. Development of aggregate sites should not be permitted.
2. Low head run-of-the-river hydropower projects may be permitted.

E. Lands

Recreation special uses should be for the purpose of enhancing the river-related experience.

F. Facilities

1. Facilities should be designed, constructed, and maintained to be compatible with the characteristic landscape, repeating its natural form, line, color, and texture.
2. Road construction within river corridors should be discouraged and shall be consistent with corridor management objectives.
3. New overhead utility lines should not be permitted within river corridors managed under this prescription. Any development of utility corridors within these river corridors should be discouraged.

G. Protection

1. Fuel treatment and site preparation should be designed to protect hardwood and conifer reproduction, understory and ground cover vegetation, snags, leave trees, and downed material in riparian areas.
2. Fire suppression techniques which minimize visual impacts should be utilized.
3. Heavy equipment may be used in fire suppression where the overall effects of the fire and its suppression would result in less impact on the environment.

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4. For moderate to high intensity wildfire (flame length over two feet), the appropriate response (strategy) should be *Control*.

MANAGEMENT PRESCRIPTION B1 - WILDERNESS

GOAL: To preserve and protect in perpetuity the primeval character and influence of the Wilderness. The area's naturalness and opportunities for solitude, challenge, risk, and inspiration will be key features. Opportunities for recreational, scenic, scientific, educational, conservation, and historical uses will be consistent with Wilderness values. Annual Wilderness Implementation Schedules that provide management direction aimed at meeting the Desired Future Condition will be developed for each area. The Limits of Acceptable Change (LAC) System will be part of the Implementation Schedule that will be used for establishing acceptable and appropriate resource, social, and managerial conditions in wilderness settings.

DESIRED FUTURE CONDITION: The area will retain its primeval character. It generally appears to have been affected primarily by the forces of nature, with evidence of human activity substantially unnoticeable. Opportunities for solitude and primitive recreation experience include a range from very high in the Primitive Trailless and Semi-Primitive Trailless areas, to high in the Primitive Trained areas, to moderate in the Semi-Primitive Trained areas. The Primitive Trailless areas afford the visitor an experience free from outside sights and sounds of other visitors and management activities, while the Primitive Trained and Semi-Primitive Trailless and Trained areas offer the visitor an experience *mostly* free from outside sights and sounds of other visitors and management activities.

APPLICABLE NATIONAL FOREST AREAS: This prescription applies to Olympic National Forest lands classified as Wilderness in the 1984 Washington Wilderness Act and later adjusted in the 1986 Forest/Park boundary changes. The Forest's five Wildernesses are:

Buckhorn: 44,258 acres, Quilcene Ranger District
Colonel Bob: 11,961 acres, Quinault Ranger District
Mt. Skokomish: 13,015 acres, Hood Canal Ranger District
The Brothers: 16,682 acres, Hood Canal and Quilcene Ranger Districts
Wonder Mountain: 2,349 acres, Hood Canal Ranger District

TOTAL WILDERNESS ACRES = 88,265

MANAGEMENT INTENSITIES: (Wilderness Resource Spectrum-WRS)

Class I (Least Pristine)

An area that is characterized by a predominately unmodified natural environment. The area generally receives high to very high use. Day use may be a significant portion of the visitation. Evidence of other users within the area is high, and campsites with fire rings are present. System trails are present; their difficulty level generally ranges from Easiest to More Difficult. Stock users may stay overnight. Visitors will generally not experience a high level of solitude, risk, and challenge. Rustic signs and structures may be present. There may be a high frequency of contact with management personnel. This is a Semi-Primitive (and the least pristine) WRS class.

Class II

An area that is characterized by an unmodified natural environment. The area generally receives moderate to high use. Day use may be a minor portion of the visitation. Evidence of other users within the area is moderate, and campsites without fire rings are present. System trails are present; their difficulty level generally ranges from More Difficult to Most Difficult. Stock users infrequently stay

overnight. Visitors will generally have a moderate level of solitude, risk, and challenge. Rustic signs and structures may be present. There may be a moderate frequency of contact with management personnel. This is a Semi-Primitive WRS class.

Class III

An area that is characterized by an unmodified natural environment. The area generally receives low to moderate use. Day use may be a minor portion of the visitation. Evidence of other users within the area is low to moderate, and campsites without fire rings exist, but are not noticeable from each other. System trails are not present. Stock users infrequently stay overnight. Visitors will generally have a high level of solitude, risk, and challenge. There are no signs or structures. There will be a low frequency of contact with management personnel. This is a Primitive WRS class.

Class IV (Most Pristine)

An area that is characterized by an unmodified natural environment. The area generally receives very low to low use. There is generally no day use. Evidence of other users within the area is very low, and campsites and fire rings do not exist. System trails are not present. Stock users do not visit this area. Visitors will have a high level of solitude, risk, and challenge. There are no signs or structures. There will be a very low frequency of contact with management personnel. This is a Primitive (and the most pristine) WRS class.

STANDARDS AND GUIDELINES:

A. Recreation

1. Motorized vehicles, motorized equipment, motorboats, aircraft landings, or other forms of mechanical transport (including mountain bicycles) shall be prohibited except as necessary to meet minimum requirements for the administration of the area for the purpose of the Wilderness Act, including measures required in emergencies involving the health and safety of persons within the area.
2. The trail system should be designed and managed to disperse use to sites that are suitable for overnight camping and/or offer interesting day use opportunities, while avoiding degradation of the Wilderness resource.

B. Wilderness

Each Wilderness should have an Implementation Schedule. Direction for site-specific management of the resource, social, and managerial factors, along with well-defined standards, shall be identified through the LAC process and monitored for each Wilderness as part of the Implementation Schedule. Wilderness management should be consistent with the criteria for the appropriate management intensity (Wilderness Resource Spectrum class).

C. Wildlife and Fish

1. Structural fish and wildlife habitat improvements shall not be allowed.
2. Fish stocking may continue in previously stocked lakes and streams. Stocking shall only be with indigenous or native species or as specified in the "High Lake and Stream Survey Report," parts 1 and 2. Stocking shall be discontinued when the limits of acceptable change are approaching or exceeding the acceptable limit and the unacceptable changes are related to fish being in the

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lake or stream. Stocking of barren lakes and streams shall be evaluated through an environmental analysis.

3. Use of aircraft may be permitted for the purpose of stocking lakes and streams where such use existed prior to the establishment of the Wilderness.
4. Wildlife and fish populations should be managed to prevent damage to habitat that affects Wilderness values. Unacceptable changes shall be determined through the LAC process.

D. Range

1. Grazing permits shall not be issued.
2. Open grazing by recreational stock shall not exceed standards set using the LAC process. Supplements should be packed in for feed.

E. Timber

1. Timber management activities shall not be permitted under this management prescription.
2. Scheduled timber harvest activities and road construction outside of the Wilderness may extend right up to the Wilderness boundary. However, the impacts of these activities should be considered, and mitigated when necessary to maintain the Desired Future Condition.

F. Water, Soil, and Air

1. Human and livestock use that has the potential to adversely affect water quality should be minimized.
2. Class II air quality standards shall be maintained.
3. Air quality studies shall be conducted to determine whether these Wildernesses should be redesignated as Class I air quality areas.

G. Minerals

1. Subject to valid existing rights, Wildernesses shall be legislatively withdrawn from all forms of appropriation and disposition under the mining and mineral leasing laws.
2. Prior to approval of an operating plan for a mining activity which would not be compatible with the preservation of the Wilderness environment, the validity of the claim must be determined.

H. Lands

1. Permits, licenses, easements, and rights-of-way should not be allowed unless necessary to meet the objectives of the Wilderness Act.
2. If the properties become available, the Forest Service should acquire private lands within Wildernesses.
3. Efforts should be made to gain the cooperation of private landowners within and adjacent to Wildernesses to protect Wilderness values.

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I. Facilities

1. New roads shall not be permitted unless provided for in the Wilderness Act.
2. Recreation and administrative facilities, such as trailheads, trails, toilets, signs, fire rings, etc., should be compatible with each management intensity.
3. Trails shall be posted as closed to motor vehicles and equipment and to mountain bicycles.
4. Unauthorized facilities and improvements shall be removed as per Forest direction.
5. Wilderness boundaries shall be posted adjacent to trails and cross-country routes entering the Wilderness. Where exterior activities could encroach upon the Wilderness, boundaries shall be posted prior to initiating the activity along the boundary.
6. Wilderness shall be excluded from consideration for development of utility corridors.

J. Protection

1. Fire prevention should be designed to reduce or eliminate human-caused fires and to explain the role fire plays in natural processes.
2. Naturally occurring fires (lightning) shall be considered an inherent part of the general Wilderness ecosystem.
3. All wildfires shall receive an appropriate suppression response. Suppression actions may include surveillance, confinement, containment, or control depending on fire location and burning conditions.
4. Low-impact suppression measures shall be applied. Some forms of mechanized equipment may be used if the result is to lessen the long-term physical and social impact on Wilderness areas from suppression actions.
5. Prescribed fires may be used as a tool to manage ecosystems within the Wilderness in accordance with Wilderness Implementation Schedules for each Wilderness (FSM 2324).

MANAGEMENT PRESCRIPTION C1 - SPOTTED OWL HABITAT AREAS (SOHAs) (OLD-GROWTH/MATURE FOREST)

GOAL: The primary goal of this management prescription is the maintenance of suitable habitat areas to meet the needs of spotted owl populations and other species associated with the same habitat type. Additional goals are to: 1) provide a long-term natural gene pool of all species, plant and animal, that are found in this ecosystem; 2) provide an area to study this type of ecosystem; and 3) provide for aesthetic needs.

DESIRED FUTURE CONDITION: Contiguous land areas of 3,000 acres or greater containing the following features: an overstory of mature or overmature trees with deformed, broken or dead tops, large, gnarled limbs with mosses and lichens present, deeply furrowed bark, and internal defects. The canopy should be multi-layered with deciduous and/or conifer trees of one or several age classes. Generally, the stands should include at least four standing dead or defective trees per acre, each with a diameter of 20 inches or greater, along with many downed logs, the majority having a diameter greater than 20 inches. These stands should have an overstory with an average crown cover of 70 percent; understory should be broken and patchy. Evidence of human activities may be present, but does not significantly alter the other characteristics, and would be a subordinate factor in a description of the stand.

APPLICABLE NATIONAL FOREST AREAS: This prescription is applied to areas throughout the Forest which were selected in accordance with the standards and guidelines in the Supplement to the Environmental Impact Statement for an Amendment to the Pacific Northwest Regional Guide (USDA 1988).

MANAGEMENT INTENSITY: The following intensity is appropriate for management of SOHAs:

Designation of SOHA areas in which no timber harvest is programmed (i.e. "dedication"). A management strategy will be prepared for each SOHA to determine if some management activity is appropriate for achieving the Desired Future Condition.

STANDARDS AND GUIDELINES:

General: If habitat is lost to blowdown, fire, or other cause, an assessment shall be done to determine if it is necessary to replace the lost habitat. When deemed necessary, it shall be replaced with suitable habitat, if available. Replacement stands may also be appropriate for meeting the Desired Future Condition.

A. Recreation

1. Proposed developed recreation sites must be evaluated for the impact on the SOHA and developed only if there are replacement stands of equal or better habitat that can be added to the SOHA.
2. Motorized vehicle use should be confined to roads and trails.

B. Wildlife and Fish

1. Any proposed activity within the SOHA stands must be supported by an environmental analysis which clearly displays that the proposed activity will not have a negative impact on the SOHA habitat quality, or that replacement stands of equal or greater habitat quality are available and are being added to the SOHA.

2. Areas where activity is proposed shall be surveyed according to the most current protocol used by Region 6.

C. Timber

Timber harvest shall not be programmed in these areas. SOHA stands should not normally be salvaged. The dead and down material should be left in place. The exceptions to the above may include the following:

1. Blowdown, etc., may be removed if it is so complete that there is no remaining habitat value, as determined through the needs assessment required under the general standard and guideline above.
2. Individual special product species or trees may be removed if it does not reduce the habitat quality of the area for spotted owls.
3. Removal was determined appropriate to improve the stand for spotted owl needs by an interdisciplinary process which included key agencies and organizations.
4. Fuelwood gathering and cutting compatible with the goals of the area may be permitted.

D. Minerals and Energy

1. Development of new, and expansion of existing, common mineral material sources shall not be permitted unless an environmental analysis shows that the size and shape of the opening and the level of activity would not reduce the value of the habitat within the SOHA.
2. Development of hydropower projects must be compatible with the goal of this prescription.

E. Lands

New permit proposals within SOHAs shall be consistent with the goal of this prescription.

F. Facilities

1. Development or expansion of powerlines, electronic sites, and other special uses that require the creation of openings shall not be permitted unless an environmental analysis shows that the size and shape of the opening would not reduce the value of the habitat within the SOHA. The option exists for the addition of replacement stands of equal or greater biological value. However, due to the width and linear nature of certain types of special uses, the impact on the existing SOHA may be greater than the actual acre loss. This could require a larger number of replacement acres.
2. New roads and trails generally should not be permitted within SOHAs unless no reasonable alternative exists.
3. Structures may be permitted if required habitat characteristics as defined in the Desired Future Condition can be maintained.

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G. Protection

1. Management activities should be designed to prevent pest outbreaks; e.g., blowdown should be removed when consistent with the Desired Future Condition. Pest outbreaks which threaten large portions of a SOHA should be actively suppressed. Biological methods will be favored.
2. Fire suppression response within the SOHA should be *Control*. The means of suppression shall be designed to minimize impacts to the SOHA.

**MANAGEMENT PRESCRIPTION C2 - PILEATED WOODPECKER/
PINE MARTEN HABITAT AREAS
(REPRODUCING PILEATED WOODPECKER HABITAT/MATURE FOREST)**

GOAL: Provide mature forest habitat for the pileated woodpecker and marten, the indicator species for wildlife associated with mature habitats. Additional goals are to: 1) provide a long-term natural gene pool of all species, plant and animal, that are found in this ecosystem; 2) provide an area to study this type of ecosystem; and 3) provide for aesthetic needs.

DESIRED FUTURE CONDITION: Stands of conifer trees of at least 160 contiguous acres for pine martens and at least 300 acres for pileated woodpeckers, with a multi-layered canopy of at least two layers. The 300 acres of mature habitat for pileated woodpeckers is designed to provide for reproducing (nesting) needs. (An additional 300 acres outside of this 300-acre core provides for the foraging needs of the woodpeckers. The foraging habitat need not be in a mature forest condition.) The overstory should be dominated by conifers with diameters greater than 21 inches with incised bark, slowed crown-growth, and rounded tops. In addition, some of the overstory trees should have heavy, gnarled limbs with mosses and lichens present. Overstory should have a minimum crown canopy cover of 50 percent, with patchy intermediate and tolerant trees having a diameter greater than eight inches. Additional stand characteristics will be broken-topped trees, at least two standing dead trees per acre with diameters greater than 12 inches, and eight percent of the total standing dead trees greater than 20 inches in diameter. At a minimum, an average of six down logs per acre greater than 12 inches in diameter and over 20 feet long should be present.

APPLICABLE NATIONAL FOREST AREAS: This prescription is applied to areas throughout the Forest which were selected in accordance with criteria in "A Report on the Management Requirements for Forest Planning on the National Forests of the Pacific Northwest Region," USDA Forest Service, June 1986.

MANAGEMENT INTENSITIES: The following intensity may be used for management of mature habitat:

Designation of mature habitat areas in which no timber harvest is programmed (i.e. "dedication").

STANDARDS AND GUIDELINES:

General: If habitat is lost to blowdown, fire, or other cause, an assessment shall be done to determine if it is necessary to replace the lost habitat. When deemed necessary, it shall be replaced with suitable habitat if available.

A. Recreation

1. Proposed developed recreation sites must be evaluated for the impact on the area and developed only if there are replacement stands of equal or better habitat that can be added to the habitat area.

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2. Motorized vehicle use should be confined to roads and trails.

B. Wildlife and Fish

1. Indicator species for mature forest habitat:
 - a. Pileated woodpecker: This is a management indicator species for mature habitat. Three hundred contiguous acres of mature conifers should be maintained.
 - b. Marten: This is a management indicator species for mature habitat. One hundred sixty contiguous acres of mature conifers should be maintained.
2. Any proposed activity within the area must be supported by an environmental analysis which clearly displays that the proposed activity will not have a negative impact on the area's habitat quality, or that replacement stands of equal or greater habitat quality are available and are being added to the area.

C. Timber

Timber harvest shall not be programmed in these areas. Stands should not normally be salvaged. The dead and down material should be left in place. The exceptions to the above may include the following:

1. Blowdown, etc., may be removed if it is so complete that there is no remaining habitat value, as determined through the needs assessment required under the general standard and guideline above.
2. Individual special product species or trees may be removed if it does not reduce the habitat quality of the area for pileated woodpeckers or pine martens.
3. Removal is determined appropriate to improve the stand for species needs by an interdisciplinary process which includes key agencies and organizations.
4. Fuelwood gathering and cutting compatible with the goals of the area may be permitted.

D. Minerals and Energy

1. Development of new, and expansion of existing, common mineral material sources shall not be permitted unless an environmental analysis shows that the size and shape of the opening and the level of activity would not reduce the value of the habitat within the area.
2. Development of hydropower projects must be compatible with the goal of this prescription.

E. Lands

New permit proposals within the area shall be consistent with the goal of this prescription.

F. Facilities

1. Development or expansion of powerlines, electronic sites, and other special uses that require the creation of openings shall not be permitted unless an environmental analysis shows that the size and shape of the opening would not reduce the value of the habitat within the area. The

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option exists for the addition of replacement stands of equal or greater biological value. However, due to the width and linear nature of certain types of special uses, the impact on the existing area may be greater than the actual acre loss. This could require a larger number of replacement acres.

2. New roads and trails generally should not be permitted within the areas, unless no reasonable alternative exists.
3. Structures may be permitted if required habitat characteristics as defined in the Desired Future Condition can be maintained.

G. Protection

1. Management activities should be designed to prevent pest outbreaks; e.g., blowdown should be removed when consistent with the Desired Future Condition. Pest outbreaks which threaten the area should be actively suppressed. Biological methods will be favored.
2. Fire suppression response within the area should be *Control*. The means of suppression shall be designed to minimize impacts to the habitat area.

MANAGEMENT PRESCRIPTION C3 - BALD EAGLE MANAGEMENT AREAS (BEMAs)

GOAL: Provide sufficient habitat for nesting and wintering bald eagles so as to expedite their removal from the Federal and State threatened or endangered species lists. Additional goals are to: 1) provide a long-term natural gene pool of all species, plant and animal, that are found in this ecosystem; 2) provide an area to study this type of ecosystem; and 3) provide for aesthetic needs.

DESIRED FUTURE CONDITION: Optimally, each Bald Eagle Management Area will contain at least two uneven-aged forested stands of three or four layers, each at least 32 acres in size. These stands will be within one-quarter mile of one another. Also, they will contain 75 to 100 percent conifers, with some of the dominant trees being either Douglas-fir or Sitka spruce greater than 150 feet tall and greater than 50 inches DBH. Canopy closure will be 50 to 70 percent, with 50 to 60 trees per acre being greater than 11 inches DBH, 14 to 16 trees per acre greater than 125 feet high, and 18 to 21 trees per acre 75 to 125 feet high. These stands are generally within 500 feet of a major water body and more than 1,000 feet from significant disturbance. Territories are generally greater than one mile apart. Exceptions to the above conditions will occur.

Winter feeding areas will contain at least two trees per acre greater than 150 feet tall and 21 inches DBH for hunting and perching. These trees will be within 200 feet of the shoreline of feeding waters. Winter feeding areas will be relatively free of disturbance during the months of eagle occupancy.

The core of winter roosts and staging areas will consist of mature or old-growth forest stands with a conifer canopy closure greater than 70 percent. The core will lie within a one-quarter mile area (determined by topography, visibility, and amount of human activity) consisting of vegetation of sufficient structure to minimize line of sight contact with possible disturbances.

APPLICABLE NATIONAL FOREST LANDS: Existing and potential nesting areas identified in the Pacific States Bald Eagle Recovery Plan (16 areas).

Winter Feeding: Areas identified as supporting regular occurrences of eagles at the same location during at least three different years, not necessarily consecutive.

Roosting: Areas identified as colonial roosts or staging areas by the presence of regular concentrations (greater than 10 individuals) of eagles during at least three different years, not necessarily consecutive.

MANAGEMENT INTENSITIES: Designation of habitat in which no timber harvest is programmed (i.e. "dedication").

STANDARDS AND GUIDELINES:

A. Recreation

1. Developed recreation sites proposed within a Bald Eagle Management Area (BEMA) must be evaluated for the impact on the BEMA and developed only if there is a replacement stand of equal or better habitat that can be substituted.

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2. Motorized vehicle use shall be confined to roads and trails.

B. Wildlife and Fish

1. Occupied bald eagle nests should be monitored to determine the effects of planned actions on the nesting birds.
2. Informal consultation shall be initiated with the USDI Fish and Wildlife Service if it is determined that a project may affect a BEMA.
3. A management plan shall be prepared for the 16 sites, existing and potential, identified in the Pacific States Bald Eagle Recovery Plan (1986). Each plan should conform to the requirements in the "Working Implementation Plan for Bald Eagle Recovery in Oregon and Washington (January 1989)."
4. Silvicultural prescriptions should be developed for maintaining or accelerating growth of suitably formed nest, perch, and roost trees within the BEMAs. This generally means managing for old-growth characteristics.
5. When a new bald eagle nest site is discovered on the Forest, a BEMA should be established, and one of the BEMAs which is unoccupied should be deleted. A management plan should be developed for the new BEMA as soon as is practical. The following guidelines should be used when establishing a new BEMA:
 - a. A 32-acre stand should be established around the nest tree. This area should be designated as the primary nest site.
 - b. A 32-acre stand should be selected within one-quarter mile of the primary nest site. This should be designated as the alternate nest site. This stand should approximate the conditions described in the Desired Future Condition.

C. Timber

Timber harvest shall not be programmed in these areas. Bald eagle management areas should not normally be salvaged. The dead and down material should normally be left in place. The exceptions to this rule may include the following:

1. Blowdown, etc., may be removed if it is so complete that there is no remaining habitat value.
2. Individual special product species or trees may be removed if doing so does not reduce the habitat quality of the area for bald eagles.
3. Removal of the timber is determined appropriate to improve the stand for bald eagle needs by an interdisciplinary process, which should include key agencies and organizations.
4. Fuelwood gathering and cutting compatible with the goals of the area may be permitted.

D. Minerals and Energy

1. Development and management of new, and expansion of existing, common mineral material sources shall be discouraged.

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2. Development of hydropower projects must be compatible with the goal of this prescription.

E. Lands

New permit proposals within BEMAs shall be consistent with the goal of this prescription.

F. Facilities

1. Development or expansion of powerlines, electronic sites, and other special uses that require the creation of openings shall not be permitted unless an environmental analysis shows that the size and shape of the opening would not reduce the value of the habitat within the BEMA. The option exists for the addition of replacement stands of equal or greater biological value. However, due to the width and linear nature of certain types of special uses, the impact on the existing BEMA may be greater than the actual acre loss. This could require a larger number of replacement acres.
2. New roads and trails should only be permitted within BEMAs if no other reasonable alternative exists.
3. Structures may be permitted if required habitat characteristics as defined in the Desired Future Condition can be maintained.

G. Protection

1. Management activities should be designed to prevent pest outbreaks; e.g., blowdown should be removed when consistent with the Desired Future Condition. Pest outbreaks which threaten large portions of a BEMA should be actively suppressed. Biological methods will be favored.
2. Fire suppression response within the BEMA should be *Control*. The means of suppression shall be designed to minimize impacts to the BEMA.

MANAGEMENT PRESCRIPTION E1 - TIMBER MANAGEMENT

GOAL: The primary goal is to produce timber on a long-term sustained yield basis. All silvicultural practices and techniques are available for use. Analysis of Integrated Resource Analysis Areas (IRAAs) will be used to schedule timber harvest from suitable lands and for analyzing project alternatives.

DESIRED FUTURE CONDITION: Evidence of land intensively managed for timber production and other forest products is apparent. Tree sizes and mixtures of native species, from seedlings to mature sawtimber, are well distributed and at age classes needed to maintain sustained yield. Most stands are even aged. Harvest generally occurs at culmination mean annual increment (CMAI). Some stands may be managed to provide ecological diversity or old-growth characteristics.

APPLICABLE NATIONAL FOREST AREAS: Includes suitable forest lands not allocated to other management prescriptions that preclude or limit timber harvest.

MANAGEMENT INTENSITIES:

Intensity Level One: The following intensities are available when planting is the acceptable method of reforestation. Harvest generally occurs at culmination mean annual increment. Includes fertilization of stands where soils indicate adequate positive response. Assumes growth gains due to use of genetically improved forest stock where appropriate.

Intensity	Management Sequence
1a. H-PL-PCT-CT-H	Harvest, Plant, Precommercial Thin, Commercial Thin, Harvest
1b. H-PL-CT-H	Harvest, Plant, Commercial Thin, Harvest
1c. H-PL-PCT-H	Harvest, Plant, Precommercial Thin, Harvest
1d. H-PL-H	Harvest, Plant, Harvest

Intensity Level Two: The following intensities are available on areas where planting is not an acceptable method of reforestation (e.g. rocky soils). No fertilization or genetic gain is planned.

Intensity	Management Sequence
2a. H-NR-H	Harvest, Natural Regeneration, Harvest
2b. H-NR-PCT-H	Harvest, Natural Regeneration, Precommercial Thin, Harvest

Intensity Level Three: Timber management prescriptions which provide for ecological diversity, old-growth characteristics, and/or other resource needs. Management activities may be as for intensities one and two, but significant standing volume and large down material is left on the site after final harvest.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

STANDARDS AND GUIDELINES:

A. Recreation

1. The area may be managed as Roaded Natural, Modified, or Rural on the ROS.
2. Dispersed recreation activities shall be managed to provide a wide variety of recreational opportunities that are compatible with the Desired Future Condition.
3. All management activities should be coordinated in order to minimize adverse impacts upon recreational opportunities and activities.

B. Wildlife and Fish

Management activities shall be conducted so as to meet or exceed Management Requirement specifications for wildlife and fish indicator species.

C. Range

Livestock grazing should be compatible with timber production objectives.

D. Timber

1. Decision to harvest should be supported by an environmental analysis, which includes an economic analysis.
2. Fertilizer should be applied to stands where soil tests indicate positive response will be obtained. Consideration should be given to fertilizing, in the first decade, existing small saw stands that will be thinned in the first decade and existing pole stands that will be thinned in the second decade.
3. Stocking control must be given high priority; precommercial thinning should be scheduled to increase diameter and volume growth.
4. Commercial thinning should be prescribed in suitable forest types.
5. The planting of genetically superior trees should be the expected reforestation practice where applicable. Seedlings should be matched to the appropriate genetic zone.
6. Timely site preparation for artificial regeneration should occur to assure adequate stocking within three years of final harvest.

Timely site preparation for natural regeneration should occur to assure adequate stocking within five years of final harvest.

For either artificial or natural regeneration, consideration should be given to advanced regeneration.

Management of logging residue should be accomplished so as to permit the establishment of a new stand within the desired time period.

7. Replanting should be scheduled to obtain desired stocking levels.
8. Timber damaged by fire, windthrow, or other catastrophe should be scheduled for harvest to minimize loss due to decay.
9. Consistent with resource objectives, specialized forest products should be marketed to customers as an opportunity to serve the public while generating revenue. Specialized forest products should be viewed as a profitable program. Opportunities for new products should be pursued.
10. Increased timber utilization should be sought through application of directional felling techniques and residue management emphasis.
11. Development of state-of-the art logging systems applications shall be encouraged to improve cost-effectiveness of harvesting and overall quality of land management.
12. Contract preparation and administration shall be done in a manner that maintains a high level of timber utilization and improves overall quality of land management, while following what is recommended and approved in the environmental assessment described in #1 above.

E. Facilities

1. Trails and trailheads should be protected. Trails and trailheads damaged by timber harvesting and/or road construction activities should be restored or replaced.
2. Local road access for timber management should be adequate for logging, post sale activities, and protection. Long-term local roads for timber access should be planned, constructed, maintained, and operated to be economically efficient while protecting resources.
3. During commercial hauling activities, public safety should be provided for.
4. Development of utility corridors should be permitted.

F. Protection

1. Cost-effective slash treatment alternatives to burning should be initiated.
2. Prescriptions will be utilized to manage pests within the constraints of laws and regulations while meeting Forest management objectives. Prescription selection will be based on an environmental analysis.
3. For moderate to high intensity wildfire (flame length over two feet), the appropriate response (strategy) should be *Control* and *Contain*, except in plantations up to twenty years of age where the appropriate response is *Control*.

MANAGEMENT PRESCRIPTION F1 - MUNICIPAL WATERSHEDS

GOAL: The primary goal is to provide high quality water for domestic use over the long-term. A secondary goal is to minimize soil erosion associated with management activities.

DESIRED FUTURE CONDITION: To meet these goals, activities within municipal watersheds should meet or exceed specific Best Management Practices. The watershed will consist of a mosaic of even-aged managed timber stands which represent all age classes up to rotation age. When conflicts exist between watershed management and other resources, the conflict should be resolved in favor of the watershed resource (while meeting Management Requirement specifications).

APPLICABLE NATIONAL FOREST LANDS: This prescription will be applied to those areas designated as municipal watersheds (service to 25 or more people).

MANAGEMENT INTENSITIES: One intensity is appropriate: that necessary to achieve the Goal and Desired Future Condition.

STANDARDS AND GUIDELINES:

A. Recreation

1. Overnight camping and off-road vehicle use is prohibited in Wishkah Watershed.
2. Dispersed recreation activities shall be managed to provide a wide variety of recreational opportunities that are compatible with the Desired Future Condition.
3. All management activities should be coordinated in order to minimize adverse impacts upon recreational opportunities and activities.

B. Timber

1. In the event of a catastrophe (fire, blowdown, insect outbreak, or disease), timber should be harvested in a manner which protects water quality.
2. Water quality must be a major factor in designing and developing timber sale alternatives.
3. Aerial application of fertilizers may be used if analysis indicates that water quality will not be adversely affected.
4. Timber harvesting should be programmed in municipal watersheds so that the acreage harvested per decade does not exceed a level which will generate sediment in excess of a specified threshold of concern, as identified with the Olympic National Forest watershed cumulative effects model.

C. Water, Soil, and Air

1. Local water system officials shall be notified of planned activities within watersheds which have the potential to affect water quality or quantity.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

2. Maintenance and improvement of water quality shall be emphasized over other resources, within applicable laws and regulations.
3. Prior to initiating ground disturbing activities, the Olympic National Forest cumulative effects model shall be used to assess the expected watershed impacts.

D. Minerals and Energy

1. Proposed mineral development activities should be consistent with the Goal and Desired Future Condition of this prescription.
2. Hydropower proposals within an identified watershed must be consistent with the objectives for that watershed.

E. Facilities

1. Facilities development should be designed to minimize impacts to streams.
 - a. Emphasis should be to minimize miles of new road construction, with low-impact roads being preferred.
 - b. Logging systems should be designed to minimize road density.
2. Existing roads no longer needed should be closed or obliterated. Vegetative cover should be established by natural or artificial methods within ten years.
3. Only road construction or reconstruction practices and locations that meet water quality goals shall be allowed.
4. All roads should have measures to control road surface and ditch water.
5. Utility corridors may be developed. Development must be consistent with the goals of this prescription.
6. Truck traffic associated with timber sales may be limited during wet weather to protect water quality.

F. Protection

1. Herbicides and pesticides should not be used. Chemicals should be used as a last resort, and only when site-specific analysis indicates that water quality will not be adversely affected.
2. Fire retardant may be used to aerially suppress fires. If used, the retardant must be approved for use in municipal watersheds. The Forest Service shall notify water system officials when retardant has been used.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

3. Fire camps should not be located within a municipal watershed. However, if such a camp is necessary, facilities must be provided so that wastes can be transported outside the watershed for disposal.
4. Prescribed slash burning should be discouraged. Fuels should normally be treated by utilization of material.
5. For moderate to high intensity wildfire (flame length over two feet), the appropriate response (strategy) should be *Control*.

MANAGEMENT PRESCRIPTION F2 - RIPARIAN AREAS

GOALS: The primary goal is to protect, manage, or improve the unique values of riparian areas for wildlife and fish habitat and water quality during the planning and implementation of land and resource management activities. Riparian areas include all lakes, ponds, streams, rivers, and water bodies.

DESIRED FUTURE CONDITION: Activities within riparian areas should result in a diversity of vegetative communities of various species, sizes, and age classes so as to meet the following objectives: (1) maintain stream channel and bank structure sufficient to maintain water quality in Class I, II, and III streams at or near existing levels; (2) provide a permanent source of natural woody debris to maintain fish habitat at or above existing levels (in general, most woody debris which enters a stream comes from the zone within 100 feet of the channel); (3) provide habitat for wildlife species; and (4) provide a filtration zone for up-slope debris or sedimentation.

APPLICABLE NATIONAL FOREST AREAS: Riparian areas consist of aquatic ecosystems and adjacent lands along streams of all classes, lakes, and impoundments. Adjacent lands are those that can directly influence the aquatic ecosystem by contributing shade, organic material, or soil. For planning purposes, the riparian area consists of a zone extending 200 feet on each side of a streamcourse or other water body.

MANAGEMENT INTENSITIES: The degree to which standards and guidelines are implemented within riparian areas will determine the intensity. Implementation of the standards and guidelines described here, in combination with those which are Forest-wide, assures meeting Management Requirement specifications.

STANDARDS AND GUIDELINES:

A. Recreation

1. Proposed developed recreation sites or expansion of existing sites should not be planned within 100-year flood plains.
2. Off-road vehicles shall be limited to trails and designated water crossings.
3. Dispersed recreation activities should be managed to provide a wide variety of recreational opportunities that are compatible with the Desired Future Condition.
4. All recreation management activities should be coordinated in order to minimize adverse impacts upon riparian values.

B. Wildlife and Fish

1. Bridges, culverts, and fords that cross anadromous fish-bearing streams shall provide unobstructed passage for adult and juvenile anadromous fish. Road crossings of resident trout streams should also maintain or improve fish passage.
2. Major projects within riparian zones of Class I, II, and III streams shall be coordinated with the Washington Departments of Wildlife or Fisheries, and with applicable Treaty tribes.
3. Riparian vegetation should be maintained along fish-bearing streams to provide, at a minimum, 60 percent canopy cover along streambanks.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

4. Riparian vegetation adjacent to fish-bearing streams should be managed in a manner that will maintain or improve streambank stability.
5. Riparian vegetation should be managed along streams, lakes, ponds, and wetlands to ensure habitat is available for wildlife and fish.
6. Emphasis should be placed on meeting both the habitat needs of cavity-dependent species and State labor safety requirements along or adjacent to streamcourses.
7. Large woody debris should be left in, over, and around fish-bearing streams to provide structural fish habitat.
8. Large conifers should be left within riparian areas of fish-bearing streams to provide a source of future large organic debris in streams.
9. Existing special aquatic habitats should be protected. Additional habitats may be created where appropriate. These habitats include, but are not limited to, secondary and overflow channels and associated ponds and wetlands.

C. Timber

1. Timber harvest shall be programmed when compatible with the Desired Future Condition.
2. Trees should not be felled into stream channels of Class I, II, and III streams. Channels of Class IV streams should be avoided where appropriate. Directional felling, such as tree lining, should be required as needed to minimize damage to riparian values.
3. Logging systems that avoid disturbance to streams and streambanks should be used.
4. Damage to ground cover and understory vegetation, including nonmerchantable size conifers and hardwoods, should be minimized.
5. Riparian areas within the area of influence of planned timber harvesting shall be addressed in the environmental analysis process for effects of planned treatments.
 - a. A site-specific vegetative management prescription, developed by an interdisciplinary team and approved by a certified silviculturist, should be prepared before a harvesting plan (including salvage) is prepared for any riparian influence areas.
 - b. Riparian area vegetation prescriptions should not prescribe use of clearcut harvesting within approximately 100 feet of Class I and II streams.
6. Soils with a high erosion hazard along stream channels should be treated with the following Best Management Practices: 1) full suspension of logs during yarding; 2) minimize slash burning; and 3) leave nonmerchantable trees and other trees needed to protect riparian values. Areas of high risk of slope instability due to loss of root strength should incorporate a geotechnical analysis as part of the interdisciplinary planning process.
7. Skyline corridors that are needed to harvest adjacent lands should be of minimum width (generally 30 feet or less) where they pass through the riparian area. The space between corridors should be maximized.

D. Water, Soil, and Air

1. Water temperature increases on Class I and II streams should be limited to the quantitative criteria in State Standards. Temperatures on Class III and IV streams should not deteriorate water quality below the water quality goals for downstream Class I and II (and fish-bearing Class III) streams. Exceptions must be based on scientific rationale and full maintenance of existing beneficial uses of the water.
2. Logs and other debris that have become a part of a relatively stable stream channel should not be removed unless prescribed as a stream enhancement measure.
3. Instream flow on National Forest System lands should be protected through critical analysis of proposed water uses, diversions, and transmission applications and renewal of permits. Protection of instream flow needs may be achieved through: filing protests with the State where applications are made that adversely affect National Forest resources; asserting claims for this water under Federal or State laws where applicable; inserting protection measures into special use permits; or reaching formal agreement over use. Purchase of water rights and impoundments are other means for reducing these impacts.
4. Adverse impacts associated with modification of flood plains and wetlands shall be avoided.
5. All management activities should meet Forest Service Region 6 riparian area management goals to protect or enhance water quality, fish, wildlife, vegetation, and other riparian values.

E. Minerals and Energy

1. Common material sources should not be developed in riparian areas.
2. Operating plans for mineral extraction shall include provisions to protect riparian values and meet water quality standards of the State of Washington.
3. Licenses or permits for hydropower projects should include provisions to minimize environmental impacts. Pipelines and transmission lines should be located outside of riparian areas whenever practicable.
4. Minimum instream flow requirements shall be established for all hydroelectric projects in cooperation with appropriate State agencies.

F. Facilities

1. Roads should avoid riparian zones when possible. Location, design, and construction of necessary crossings should be based on methods that minimize adverse impacts to water and fisheries resources.
2. Construction activities in or adjacent to perennial streams should be conducted during summer low-flow season.
3. Culverts installed in large fills should be designed for control or passage of debris. Appropriate erosion prevention criteria for passage of woody debris should be used to prevent erosion of the fill.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

4. Spawning gravels should not be removed from streams.
5. Whenever road construction occurs within riparian areas, erosion control measures must be in place prior to the normal heavy rainfall period.
6. Utility corridors may be developed. Development must be consistent with the goals of this prescription.

G. Protection

1. Fuel treatment and site preparation should be designed to protect hardwood and conifer reproduction, understory and ground cover vegetation, snags, leave trees, and downed material in riparian areas.
2. For moderate to high intensity wildfire (flame length over two feet), the appropriate response (strategy) should be *Control* and *Contain*.

MANAGEMENT PRESCRIPTION J2 - RESEARCH NATURAL AREAS (EXISTING AND POTENTIAL)

GOAL: Provide opportunities for research and education on areas of National Forest land where natural processes are allowed to occur without intervention by people. Potential areas will be identified based on the latest version of the publication "Research Natural Area Needs in the Pacific Northwest."

DESIRED FUTURE CONDITION: A land area where the ecological community is evolving through natural processes, and where preservation of natural features and conditions is not jeopardized by human activity. This future condition is identified in the Research Natural Area Establishment Plan for the area.

APPLICABLE NATIONAL FOREST AREAS: The existing Quinault Research Natural Area (RNA) is included, and will be managed to achieve the Desired Future Condition. One potential RNA, Wet Weather Creek, is recommended in this Plan.

MANAGEMENT INTENSITIES: As necessary to meet the Goal and Desired Future Condition for each area.

STANDARDS AND GUIDELINES:

General: While some preliminary planning may take place, the Director for the Pacific Northwest Forest and Range Experiment Station and the Forest Supervisor shall be notified before any specific activity is proposed.

A. Recreation

1. Any new trail development should be only to the level needed to access the area and as agreed to between the Forest and the RNA Committee.
2. Existing recreational trails should be maintained in their current condition or, when appropriate, rerouted outside the RNA boundary.
3. Off-trail dispersed recreation activities should be discouraged.
4. Recreational camping and open fires should not be permitted.
5. Criteria for educational use should: (1) Minimize influence on the natural character of the RNA; (2) minimize influence on existing research activities; (3) minimize size, frequency, and intensity of group use; and (4) maximize provisions for supervising and controlling group activities.
6. Publicity that attracts the general public should be avoided.
7. Developed recreation sites shall be prohibited.
8. Collection of native plants and their seeds and parts shall be prohibited unless a scientifically-based collection permit is approved by the Forest Supervisor.

B. Wilderness

For RNAs, or portions thereof, that fall within designated Wildernesses, provisions of the Wilderness Act must be met (see **Prescription B1-Wilderness**).

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

C. Wildlife and Fish

1. Species of special interest should be managed within RNAs according to standards and guidelines for those species. Management practices that are consistent with natural ecological processes should be used.
2. Aquatic and terrestrial habitats should not be stocked with non-native fish or wildlife species.
3. Control of excessive animal populations may take place where such populations threaten naturally occurring habitat.

D. Range

No grazing shall be permitted within RNAs for either recreational or commercial livestock.

E. Timber

1. Timber harvest shall not be scheduled.
2. Logging, including fuelwood cutting, should not be permitted following fire, windthrow, insect attack, or disease, unless it is consistent with the objectives of the RNA and is approved by the RNA committee and the Forest Supervisor.
3. Hazard tree removal may only be permitted along roads when required for safety.

F. Water, Soil, and Air

Meet minimum State standards.

G. Minerals and Energy

1. RNAs shall be recommended for withdrawal from mineral entry.
2. FERC licenses or permits should not be recommended.

H. Lands

Existing right-of-way easements shall be honored, but upgrading or issuing new permits should be discouraged.

I. Facilities

1. Dispersed recreation facilities, such as trails, trail shelters, and toilets, should be prohibited unless they are consistent with the Desired Future Condition for these areas.
2. Road construction shall not be permitted unless specifically approved by the RNA committee and the Forest Supervisor.
3. Use of existing utility corridors may be continued. Upgrading or expansion shall be discouraged, and corridors should be phased out as the opportunity occurs.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

4. Development of new utility corridors shall not be permitted unless specifically approved by the RNA committee and the Forest Supervisor.

J. Protection

1. Use of prescribed fire may be considered to perpetuate the ecological conditions the RNA is meant to represent. Prescribed burn plans shall be submitted to the Pacific Northwest RNA Committee for review and recommendations.
2. For moderate to high intensity wildfire (flame length over two feet), the appropriate response (strategy) should be *Control*.
3. Fuels should be allowed to accumulate at natural rates.
4. Pest infestations and animal impacts that may threaten the RNAs or adjacent areas should be monitored.
5. Control or suppression of pest outbreaks may be considered to meet RNA objectives or to prevent excessive damage to adjacent areas. Suppression plans shall be submitted to the RNA Committee and the Forest Supervisor. Biological methods are preferred.

MANAGEMENT PRESCRIPTION J3 - BOTANICAL AREAS

GOAL: Provide opportunities for protection, study, and enjoyment of areas of special botanical interest where unusual plant communities or associations are maintained. Specific goals for the Botanical Areas may differ, and will be defined in a management direction document prepared for each area.

DESIRED FUTURE CONDITION: An area where plant communities/associations are not jeopardized by human activity.

APPLICABLE NATIONAL FOREST AREAS: This prescription is applied to areas currently occupied by unusual plants (including trees) or special plant communities, but not being currently recommended as Research Natural Areas (Prescription J2).

MANAGEMENT INTENSITIES: As needed to meet the Goal and Desired Future Condition as detailed in the management direction document prepared for each area during Forest Plan implementation. Intensities will vary and may include:

- Protection from and discouragement of any human activity.
- Use of the area for research and study purposes.
- Use of the area for public education and interpretation.
- Use of the area for controlled utilization of certain plant species (e.g. mushroom picking).
- A combination of the above.

The general emphasis for each area, which will be supplemented by a site-specific management direction document, is as follows:

Three Peaks Botanical Area: The emphasis will be on protection, interpretation, and scientific research for the unique values and opportunities afforded by this area. Opportunities exist to provide botanical interpretation to the public and educational institutions and to provide scientific research on subjects such as historic climatic reconstruction.

Buckhorn Botanical Area: Emphasis will be on protection and research of the area. Off-site educational activities (such as brochures and talks) may be developed to increase public awareness of the fragile environment, and hence encourage minimum impact camping techniques. The existing system trail would be maintained in its current condition.

Cranberry Bog Botanical Area: Emphasis will be on protection, education, and research. Educational activities and facilities (such as a trail) may occur on-site.

Pat's Prairie Botanical Area: Emphasis will be on education and research. Educational activities and facilities (such as a trail) may occur on-site.

Three O'Clock Ridge Botanical Area: Emphasis will be on protection and research. No development would occur on-site. Off-site information materials would be available to the public upon request.

Tyler Peak Botanical Area: Emphasis will be on protection and research. No development would occur on-site. Off-site public information materials would be available to the public upon request.

"Bill's Bog" Botanical Area: The emphasis will be resource protection and maintaining the area in its natural state while allowing people to continue the historic activity of gathering mushrooms for

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

personal use. Promotion of the area will be minimal, and commercial removal of forest products will not be allowed.

Matheny Prairie Old Western Redcedar Botanical Area: The emphasis will be resource protection and maintaining the ecological integrity of the site, along with minimum development to provide access for interpretation.

Matheny Ridge Old Alaska Yellowcedar Botanical Area: The emphasis will be resource protection and maintaining the ecologic integrity of this Alaska yellowcedar stand.

North Fork Matheny Ponds Old Alaska Yellowcedar Botanical Area: The emphasis will be on resource protection (because of the fragile nature of the wetland communities), elk habitat (as evidenced by the wallows and browsing), and maintaining the ecological integrity of this stand.

Pine Mountain Botanical Area: The emphasis will be on protection of this old Alaska yellowcedar area, while providing opportunities for research and study, public interpretation, and controlled use of some plant species, such as mushroom gathering for personal use.

South Fork Calawah River Botanical Area: The emphasis will be on protection of this river bottom rain forest plant community, while providing opportunities for public interpretive activities.

STANDARDS AND GUIDELINES:

General: A management direction document shall be prepared for each Botanical Area to specify the goals and management intensity appropriate to the area. Occasional vegetative management practices may be implemented to maintain unique plant communities.

A. Recreation

1. Developed recreation sites shall be prohibited.
2. Dispersed recreation use should be consistent with the goals specified for each area in the management direction document prepared for each during Forest Plan implementation.

B. Wildlife and Fish

Utilization of native bird or animal habitat is encouraged. However, control of excessive animal populations may take place where such populations threaten desired plants.

C. Range

Livestock grazing shall not be allowed.

D. Timber

1. Timber harvest, including salvage, shall not be scheduled.
2. Competing vegetation may be removed in order to preserve the continued existence of plant species of special interest.

STANDARDS AND GUIDELINES - MANAGEMENT AREA PRESCRIPTIONS

3. Hazard tree removal may only be permitted along roads when required for safety.

E. Minerals and Energy

Areas shall be recommended for withdrawal from mineral entry.

F. Facilities

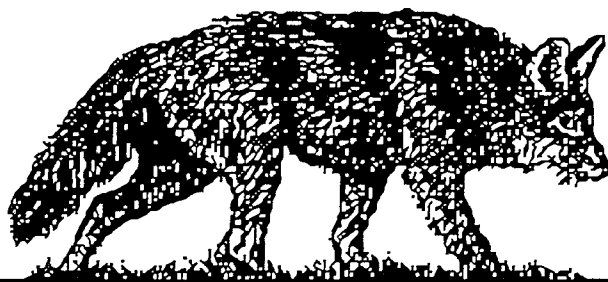
1. Construction of new transportation systems and utility corridors should generally not be allowed. When exceptions are permitted, developments must be consistent with the Goal and Desired Future Condition of this prescription.
2. Structures should not be permitted unless Botanical Area characteristics can be maintained.

G. Protection

1. For moderate to high intensity wildfire (flame length over two feet), the appropriate response (strategy) should be *Control*.
2. No action should be taken against insects and diseases unless an outbreak threatens the plants being protected or is inconsistent with management goals for adjacent areas.
3. Additional restrictions or constraints, such as requiring plant collection permits, may be called for in the management direction document prepared for each Botanical Area.

Chapter V

Implementation of the Forest Plan



Olympic National Forest

Chapter V

IMPLEMENTATION OF THE FOREST PLAN

INTRODUCTION

Implementation of the Olympic National Forest Plan requires transition from an existing management program, with its budget and "targets" for accomplishment, to a new program with a different budget, and other goals and objectives. Because of the length of time needed to prepare budget requests and schedule management activities, it is not feasible to implement the entire Plan in the first year. The Forest will "phase into" a schedule of activities designed to attain the desired output levels through the first decade. Forest programs will go through a transition as activity levels change from current program levels to those of this Plan.

This chapter incorporates direction for management of the Olympic National Forest in three sections under the headings of Implementation Direction, Monitoring and Evaluation Program, and Amendments and Revisions. Collectively, these sections explain how management direction will be implemented, how implementation activities will be monitored and evaluated, and how the Plan can be kept current in light of changing conditions or other findings.

IMPLEMENTATION DIRECTION

Implementation of the Forest Plan occurs through identification, selection, scheduling, and execution of management practices to meet management direction provided in the Plan. Implementation also involves responding to proposals by others for use and/or occupancy of National Forest System lands.

PROJECT SCHEDULING

A schedule of proposed and probable projects is displayed in Appendix A of this document. The projects displayed are an indication of the amount of activity needed to achieve goals and objectives of this Plan.

The listed projects are likely to change as projects are implemented, new information becomes available, or new, more cost-efficient projects are identified to accomplish the objectives. The projects in Appendix A are scheduled in response to the planned output of goods and services and the annual budget needed to achieve the Plan goals and objectives.

CONSISTENCY WITH OTHER INSTRUMENTS

The Forest Plan will supercede, maintain as is, or result in the revision of previous resource management and implementation plans for the Olympic National Forest. See Table V-1 for a list of the major plans being

IMPLEMENTATION DIRECTION

affected. As soon as practical after approval of the Forest Plan (subject to existing rights), the appropriate plans identified in Table V-1 will be revised as necessary to implement the direction contained in the Forest Plan. Future permits, contracts, cooperative agreements, and other instruments for the use and occupancy of National Forest system lands will generally be issued in compliance with Forest Plan requirements immediately on approval of the Forest Plan. Permits, contracts, and agreements existing at the time of Forest Plan approval will be updated and amended to Forest Plan standards whenever possible (see 36 CFR 219.10(e)), subject to valid, existing rights.

Table V-1. Disposition of Existing Olympic National Forest Plans

Plan Name	Incorporate/Amend	Su-percede
Soleduck Land Use Plan		X
Quinault Land Use Plan		X
Canal Front Land Management Plan		X
Satsop Block Land Management Plan		X
Timber Management Plan, Peninsula Working Circle		X
Timber Management Plan, Quinault Working Circle		X
Timber Management Plan, Shelton CSYU		X
Plan Designating Types of Travel Permitted on Trails (1976)		X
Olympic Peninsula Off-Road Vehicle Comprehensive Study (1990)	X	
Lake Quinault South Shore Composite Plan	X	
Dead and Defective Tree Management Plan	X	
Olympic National Forest Road Management Plan	X	
1972 Fire Management Plan		X
Olympic National Forest Trail Plan	X	
Memoranda of Understanding - Fire	X	
Wishkah Watershed Memorandum of Understanding	X	
Quilcene Municipal Watershed Letter of Intent	X	
Landownership Adjustment Plan	X	
Grays Harbor Federal Sustained Yield Unit Policy	X	
Shelton Cooperative Sustained Yield Unit Agreement	X	
Memoranda of Understanding with Washington State Departments of Fisheries and Game	X	
Olympic National Forest Tree Improvement Plan	X	
Statewide Comprehensive Wildlife and Fisheries Management Plan	X	
Approved Forest Species Management Guides	X	
High Lake and Stream Survey Report, Parts 1 and 2	X	
Columbia Basin Anadromous Fish Policy and Implementation Guide	X	

BUDGET PROPOSALS

The Forest Plan's scheduled projects and activities (presented in Appendix A) are translated into multi-year program budget proposals that identify needed expenditures to achieve the stated Plan objectives and output levels. The schedule is used for preparing budget requests and allocating funds needed to carry out planned management direction. Upon approval of a final budget for the Forest, the annual program of work will be finalized and carried out. Outputs and activities in individual years may be different from those shown in Chapter IV and Appendix A, depending on final budgets.

ENVIRONMENTAL ANALYSIS

Projects and activities described in, or permitted by management direction in this Plan will be further analyzed through the NEPA process. This analysis will be completed as projects are planned for implementation. If the environmental analysis for a project shows that: (1) management area prescriptions, standards and guidelines can be achieved, and (2) no new significant impacts have been identified or no new significant impacts have been identified beyond those identified and documented in the Environmental Statement for the Forest Plan, a categorical exclusion from further analysis may be warranted. This means that an analysis file and/or project file will be available for public review, but the analysis will not necessarily be documented in the form of an environmental assessment or environmental impact statement.

MONITORING AND EVALUATION

Monitoring and evaluation will provide the public, the Regional Forester, and Forest officials with information on the progress and results of implementing the Forest Plan. Monitoring identifies key activities and outputs to be tracked during implementation of this Plan. The tracking is done to ensure that activities reasonably conform to management area direction and that outputs and effects satisfy objectives of the Plan.

Monitoring and evaluation requirements of the Olympic Forest Plan are summarized in this section. More detail, in the form of Monitoring Worksheets, is included in Appendix B of this document.

The monitoring activities identified are not intended to spell out all monitoring that is occurring, or may occur, on the Forest. Currently, many activities are being monitored to comply with administrative and legal responsibilities. However, this monitoring is often not essential for the purpose of determining whether activities are meeting the objectives of this Plan. Only those items that are essential in this regard are addressed in the monitoring items identified here. The data collected during monitoring will be evaluated using the Decision Flow Diagram that is included at the end of this chapter.

Monitoring will be designed, amended, or revised to test the resolution and progress of the Issues, Concerns, and Opportunities (ICOs) that the Forest Plan was to resolve. Specific monitoring and evaluation efforts will determine if:

1. Defined goals and objectives are being achieved.
2. Specific program plans and activities are responsive to public issues and management concerns.
3. Management activities are in compliance with Standards and Guidelines.
4. Standards and Guidelines maintain environmental quality.
5. Projected Benefits and Costs assumptions were correct.
6. The Forest Plan needs to be revised or amended.
7. Conditions, information data, and plan assumptions have substantially changed.
8. Monitoring topics, intensities, and intervals are commensurate with risks, costs, and values and are functional and reliable for the needed results and expectations.

MONITORING

Each monitoring question is addressed and examined through a series of thirteen (13) items.

1. **Monitoring Topic:** These relate to the public issues, management concerns, and resource management opportunities (ICOs) the Forest Plan was designed to address. A full discussion of the ICOs can be found in Chapter I and Appendix A of the FEIS. They are also summarized in Chapter I of this document. In addition to the monitoring topics identified that respond to ICOs, other topics have been added to ensure complete monitoring coverage.
2. **Threshold of Variability:** This is the variation from the expected outputs, or activities, that is permitted before corrective action or further evaluation is necessary.
3. **Monitoring Questions:** These questions are the core of the intent for monitoring. The essence of each question is, "Are things going as the Forest Plan intended?" Information to answer these will be obtained and analyzed using valid statistical procedures.
4. **Suggested Methods/Information Sources:** For each monitoring question, methods and/or sources of information are suggested. The purpose of this section is only to suggest reasonable methods or sources of information. It is not intended to exclude other methods as long as information will respond to the questions at a reasonable cost.

For single resource monitoring activities, the person responsible for the monitoring activity will determine which technique is best at the time of data gathering. Data will be collected in a manner that ensures meeting statistical parameters suggested by the monitoring questions. For interdisciplinary reviews, the Forest Supervisor will select team members who represent appropriate resources, considering the monitoring question(s) involved. A team leader will be designated. This person will be responsible for preparing and submitting a report of the findings of the monitoring activity.

5. **Unit of Measure:** This is a quantifiable measure of the output, action or effect that is being monitored.
6. **Monitoring Frequency:** For each monitoring question, the frequency with which it must be addressed is indicated. A report will be prepared by the person responsible for the monitoring activity. The report will be submitted to a Monitoring Coordinator, who will summarize findings from all reports due that reporting period (usually a year). This summary report will be submitted to the Forest Supervisor. Copies of the summary report, and of the individual reports, will be kept on file at the Forest headquarters. The summary report may also be distributed to other interested agencies and the public.
7. **Precision and Reliability:** This indicates the validity and exactness with which monitoring data are to be collected. Precision is the exactness or accuracy of measurement, while reliability is the expected probability that information acquired through sampling will reflect actual conditions. Precision and reliability are rated as follows:
 - High - Maximum variation within 10 percent of sample mean.
 - Moderate - Maximum variation within 33 percent of sample mean.
 - Low - Maximum variation within 50 percent of sample mean.
8. **Data Storage:** This is where collected monitoring data, analyses, and evaluation reports for the monitoring question are stored. The information will be stored for the duration of the Forest Plan.

9. **Reports Due:** This is the date by which reports responding to monitoring questions must be submitted. Suggested possible causes for unfavorable reports are listed. Unfavorable reports are those which indicate that actual conditions are outside expected results of the Forest Plan.
10. **Cost:** Costs are estimated and shown as an annual cost for all monitoring activities associated with each monitoring question. When work or reports are not done on an annual basis, costs shown are the average annual cost over a ten-year period. Included in parentheses are the year and expected cost for the actual monitoring activity. Example: "\$1,000 (year 5 - \$5,000 and year 10 - \$5,000)" means a total annual cost of \$1,000, but \$5,000 will be needed in year 5 of the plan period and another \$5,000 in year 10.

The component of total annual cost which is currently included in normal operating costs (if any) is shown in parentheses. Ex: \$3,000 (\$2,000) means a total annual cost of \$3,000 of which \$2,000 is currently included in the Forest's operating budget.

11. **Responsibility:** The person responsible for responding to the monitoring question.
12. **Research Needs:** Indicates that additional research is needed to aid in fully responding to the monitoring question.
13. **Inventory Needs:** Indicates that additional data is needed to fully respond to the monitoring question.

Table V-2 provides a summary of the monitoring worksheets included in Appendix B. Not all steps have been summarized.

EVALUATION

When a Monitoring Evaluation Question is answered, "yes", then associated activities will proceed. When a Monitoring Question is answered, "no", then further investigation will occur in order to determine whether there is a need to: 1) take corrective action in implementing Forest Plan direction; 2) amend the Forest Plan; 3) revise the output schedule; or, 4) initiate revision of the Forest Plan. This evaluation will proceed according to the flow diagram displayed in Figure V-1, Decision Flow Diagram for the Evaluation of the Forest Plan.

A designated monitoring coordinator will prepare an annual evaluation report from the Decision Flow Diagram. As applicable, the evaluation report will:

1. Summarize the responses to each monitoring question which is to be answered in the current year.
2. Identify situations where further evaluation is needed, and describe the action which will be taken.
3. Describe the status of evaluations which are underway, including the identity of the person who is responsible for conducting the evaluation, and its projected timeframe.
4. Summarize the findings of evaluations which were completed during the year, and describe the actions which were taken in response to these findings.
5. List additional research needed to support the management of the Forest.

AMENDMENT AND REVISION

The Forest Plan incorporates legal mandates, professional judgment and the public's stated concerns into a future vision of the Forest. It charts a path for getting there by developing management goals and objectives and translating them into management direction in the form of standards and guidelines for management areas on the Forest. National Forest planning is a dynamic process, and the products--Forest Plans--are similarly dynamic. Forest Plans can and should be modified if conditions warrant. As management goals are applied on the ground or as new information is learned about resources, the Plan's goals, and objectives, or activities the goals generate, may no longer be appropriate. In such instances, activities may be tailored to fit the resource, or planning objectives as stated in the Plan may be amended. Plans do not apply direction in site-specific management activities. It would be unrealistic to try to identify, analyze, and schedule the myriad projects or activities that occur on a National Forest. Instead, this type of site-specific planning occurs at the project-level planning stage.

Additional plans and/or management direction may be needed in the future to guide implementation of the Olympic Forest Plan. Should the need for these arise, they will be incorporated through amendment or revision. The Forest Supervisor may amend the Forest Plan. Based on an analysis of objectives, standards, and other contents of the Forest Plan, the Forest Supervisor shall determine whether a proposed amendment would result in a significant change in the Plan. If the change resulting from the proposed amendment is determined to be significant, the Forest Supervisor shall follow the same procedure as that required for development and approval of a Forest Plan. If the change is determined not to be significant, the Forest Supervisor may implement the amendment following appropriate public notification, such as notices in local newspapers, and satisfactory completion of NEPA procedures. Specific written notice may also be sent to organizations and individuals who have expressed a desire to be kept informed of such changes. (Refer to the Interim Directive, Chapter 1920, Forest Service Manual, under 1922-Forest Planning.)

A Forest Plan shall ordinarily be revised on a ten-year cycle, or at least every fifteen years. It also may be revised whenever the Forest Supervisor determines that conditions or demands in the area covered by the Plan have changed significantly or when changes in RPA policies, goals, or objectives would have a significant effect on Forest-level programs. In the monitoring and evaluation process, the interdisciplinary team may recommend a revision of the Forest Plan at any time. Revisions are not effective until considered and approved in accordance with requirements for development and approval of the Forest Plan. The Forest Supervisor shall review conditions on land covered by the Plan at least every five years to determine whether conditions or demands of the public have changed significantly.

The management direction in this Forest Plan was developed prior to the U.S. Fish and Wildlife Service's (FWS) listing, effective July 23, 1990, of the northern spotted owl as threatened and subsequent anticipated development of a recovery plan for the owl. Implementation of this Forest Plan will comply with the Endangered Species Act, as interpreted through consultation with the FWS, any interim management guidance, and eventually the recovery plan.

Forest Plan implementation actions will be scheduled so that conflicts with recommendations of the Interagency Scientific Committee will be avoided until the Chief makes a decision on the Regional Guide, as mandated by Section 318 of the Interior Appropriations Act of 1990.

**FIGURE V-1
DECISION FLOW DIAGRAM**

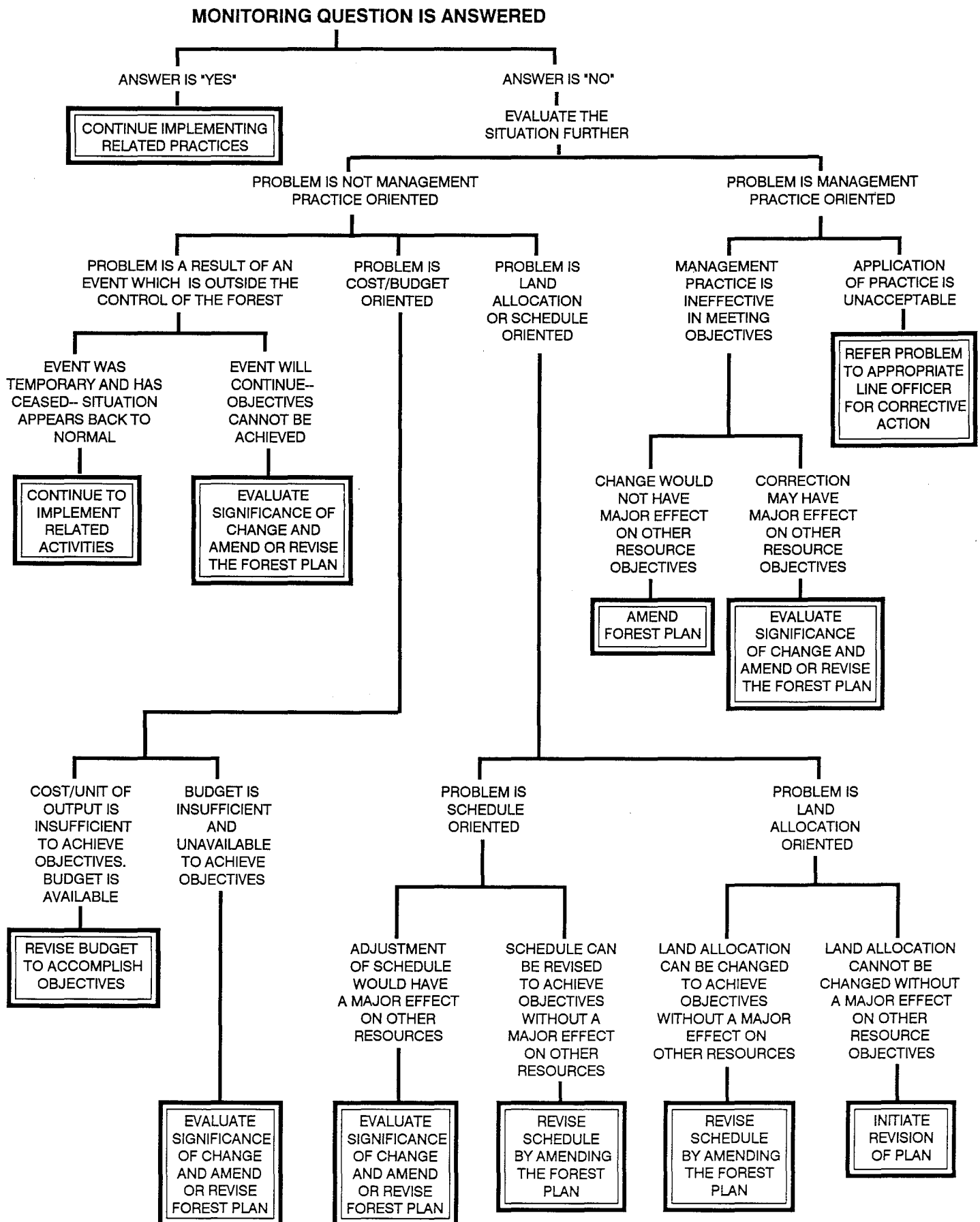


Table V-2. Summary of Monitoring Items

Monitoring Topic	Monitoring Question	Unit of Measure	Monitoring Frequency	Precision/ Reliability	Reports Due	Annual Cost \$	Responsibility	Threshold of Variability
Semi-Primitive and Primitive Recreation	Are Primitive, Semi-Primitive Non-Motorized and Semi-Primitive Motorized ROS areas provided?	Acres and ROS criteria	As projects completed	High/High	End of 5th year	200	Recreation Staff	No reduction in ROS classification acres within recreation allocations
Trails	Are trails objectives met?	# of conflicts and damage	Annually	High/High	Annually	10,000	Recreation Staff	Zero documented incidents of user conflict or resource damage
Scenery	Are VQOs met?	Acres by VQO	Annually	High/ Moderate	Every 5 years	3,000	Recreation Staff	10% of acres not in compliance with VQOs
Developed Recreation	Are sites receiving heavy use?	RVD and PAOT	Annually	High/High	Annually	10,000	Recreation Staff	Use is less than 40% of Theoretical Capacity
Wilderness	Is Wilderness character maintained?	Limits of acceptable change indicators	Annually	High/High	Annually	10,000	Recreation Staff	Change that is equal to or less than defined limits and indicators of limits
Off Road Vehicle (ORV) Use	Are adverse effects occurring?	Number of Violations, conflicts, & damage	Annually	Moderate/ Moderate	Every 3 years	8,000	Recreation Staff	Zero documentation of violations, conflicts or damage
Wild and Scenic Rivers	Are attributes maintained?	Wild and Scenic River classification criteria	As submitted, annually	High/High	Annually	500	EA Coordinator & Recreation Staff	Zero degradation of Wild and Scenic attributes

Table V-2. (Cont'd.)

Monitoring Topic	Monitoring Question	Unit of Measure	Monitoring Frequency	Precision/ Reliability	Reports Due	Annual Cost \$	Responsibility	Threshold of Variability
Cultural Resources	Are surveys performed?	Projects and acres	As projects implemented	High/High	Annually	5,000	Recreation Staff	Zero cases without survey work and SHPO consul- tation
Coordination with American Indians	Are programs and Indian concerns coordinated?	Contacts	Ongoing with annual summary	Moderate/ High	Annually	5,000	Forest Leadership Team	No incidents of conflict between For- est Policy and Indian rights; no deviation permitted in contacts/ coordination
Cultural and Histori- cal Site Protection	Are cultural resource properties (unevaluated or eligible for inclusion to the National Register of His- toric Places) being ade- quately protected?	Sites	Annual inspections	High/High	Ann. Acc. Reports	2,000	Recreation Staff	No damage or loss of values tied to National Reg- ister criteria
Cultural and Histori- cal Site Rehabilita- tion	Are repair, stabilization or rehabilitation projects scheduled and performed as necessary?	Secretary of Interior Standards and Guidelines	Annually and as implemented	High/High	With building main- tenance surveys and reports or annually	4,000	Engineering and Recreation Staff	No deviation permitted for inspections and no dam- age or loss of values
Wildlife Habitat	Are management indicator species using habitat areas set up for each species?	SOHA occupancy (% occupied)	Annually - 80%	High/High	Annually	120,000	Fish & Wildlife Program Manager	+/-20% of occupancy or expected populations
		Pileated Woodpecker & Marten area occupancy (% occupied)	Annually - 50%	High/High		25,000		

Table V-2. (Cont'd.)

Monitoring Topic	Monitoring Question	Unit of Measure	Monitoring Frequency	Precision/ Reliability	Reports Due	Annual Cost \$	Responsibility	Threshold of Variability
Wildlife Habitat (cont.)	Are management indicator species populations +/- 20% of that predicted in Habitat Capability Index	Percent being used by Primary Cavity Excavator	Annually/25%	High/High	1 report per 5 year period	15,000	Fish & Wildlife Program Manager	+/- 20% of predicted populations
		% of deer and elk in winter range	Annually/10%	Moderate/ Moderate		15,000		
		Number of bald eagle nests active	Annually	High/High		7,500		
		Number of owls	Annually - 80%/10%	High/High		12,000		
		Number of Pileated Woodpeckers and Marten	Annually/10%	Moderate/ Moderate		21,000		
		Number of birds	Annually - 10%	Moderate/ Moderate		9,000		
		Number of elk and deer	Annually	Moderate/ Moderate		2,000		
		Number of nests	Annually	High/High		7,500		
Fish Habitat	Is habitat capability being maintained?	Fish habitat capability	Annually	High/High	Annually	140,000	Fish & Wildlife Program Manager	+/- 10% of expected capability
	Are projects implemented?	Percent of projects implemented	Annually	High/High	Annually	64,000	Fish & Wildlife Program Manager	+/- 20% deviation of planned pro- gram
	Are S&Gs adequate and being implemented?	Reports	Annually	High/High	Annually	20,000	Fish & Wildlife Program Manager	Less than 10% of planned projects do not meet standards

Table V-2. (Cont'd.)

Monitoring Topic	Monitoring Question	Unit of Measure	Monitoring Frequency	Precision/ Reliability	Reports Due	Annual Cost \$	Responsibility	Threshold of Variability
Water Quality	Are water resource-related BMPs and S&Gs being implemented?	Project review report	Annually	Moderate/ High	Annually	8,000	Forest/District Hydrologist	5% of projects do not meet S&G's
	Are water resource-related BMPs and S&Gs effective?	Turbidity (NTU) and water chemistry (mg/l)	Daily/Periodic	Moderate/ High	Annually	36,000	Forest/District Hydrologist	Zero deviation of Water Quality Standards
	Are watershed improvement projects being accomplished?	% of projects implemented	Annually	High/High	Annually	1,000	Watershed Staff Officer	20% deviation of planned projects
Water Cumulative Effects	Are coefficients used in analysis valid?	Tons/year	Continuous	Moderate/ High	Annually	25,000(I), 36,000(O)	District Hydrologist or Soil Scientist	30-40% deviation in coefficients
	Are cumulative effects within range predicted in FEIS?	Acres Tons/Year	4-8 years continuous	Moderate/ High	Annually	17,000(I), 40,000(O)	Forest/District Resource Specialists	30-40% deviation from predicted effects
Riparian Areas	Are activities in riparian areas as planned?	Project review reports	Annually	Moderate/ Moderate	Annually	20,000	Watershed Staff	10% of planned projects do not meet S&G requirements
Soil Productivity	Is less than 20% of area disturbed?	Percent disturbed	25% of projects annually	Moderate/ Moderate	Annually	10,000	Watershed Staff	Adverse effects over less than 20% of Management Area
Air Quality	What are effects of prescribed burning and is State SIP Program Effective?	Incidents	100%	Moderate/ High	Each project & incident	3,600	Fire Staff	No incidents that do not meet standards for Class I control areas.

Table V-2. (Cont'd.)

Monitoring Topic	Monitoring Question	Unit of Measure	Monitoring Frequency	Precision/ Reliability	Reports Due	Annual Cost \$	Responsibility	Threshold of Variability
Costs and Values	Are allocations and prescriptions still cost-efficient?	Dollars	Annually	High/High for costs, Moderate/ Moderate for values	Annually and every 5 years	1,150	Administrative Officer and Forest Analyst	Changes that are less than 25% in experienced/ traditional costs and values
Budgets	Are projected Forest Plan programs and budgets realized?	Dollars	Annually	High/High	Annually	1,000	Planning Staff	Budget levels that deviate less than 25% from previous year
Social and Economic Effects	Are results consistent with predictions and expectations?	Numerous	Annually	High/High	Annually	1,000	Planning and Administration Staff Officers	(1) Payments to counties and U.S. Treasury vary less +/- 20% (2) Unemployment less than 12% (3) Local income level changes less than +/- 20% (4) New housing starts +/- 35% (5) Significant changes in lifestyles, values, environmental factors
Standards and Guidelines (General)	Are S&Gs implemented and do they meet objectives?	Program element or management unit S&G review	Every 2 years	High/High	Every 2 years	5,000	Staff and FLT	No results or standards less than prescribed Standards and Guidelines

Table V-2. (Cont'd.)

Monitoring Topic	Monitoring Question	Unit of Measure	Monitoring Frequency	Precision/ Reliability	Reports Due	Annual Cost \$	Responsibility	Threshold of Variability
Environmental Anal- ysis	Are proposed activities in compliance with NEPA?	Reports reviewed	As submitted	High/High	As reviewed	10,000	Forest EA Coordi- nator and District Rangers	Zero cases without NEPA documenta- tion
	Was project implementa- tion as stated in NEPA documentation?	Project review	Scheduled activity reviews	High/High	As reviewed	1,000	Activity Review Team	Zero cases not imple- mented as planned
Road Mileage	Does transportation sys- tem serve objectives and projections?	Miles of road	Annually	Moderate/ High	Every 2 years	5,000	Engineering Staff	15% of road miles con- structed do not meet resource mgt. objectives
Minerals Develop- ment & Rehabilita- tion	Are Standards and Guide- lines reasonable and effective?	Cases	Post operative and during Activity Reviews	Moderate/ Low	Every 5 years	500	Lands and Mineral Staff	No cases with inadequate protection measures or substandard rehabilitation
Insect & Disease Control	Are destructive insect and disease problems remain- ing below acceptable damage levels?	Frequency of infection centers	Bi-annual aerial flights	Medium	Bi-annual	\$1,000	Regional FPM	Less than 100% in- crease in infection fre- quency
		Acres of infection centers	Ongoing stand exams	High	Bi-annual	\$2,000 to \$4,000	Timber Staff	Less than 10% by area or less than 2 infection cen- ters per acre
Timber Offered	Is Forest offering of charge- able and nonchargeable volume commensurate with ASQ and TSPQ?	MMCF/MMBF	Annual	High	Annual	\$1,500	Timber Staff	Deviation of cumulative ASQ or TSPQ less than 15%

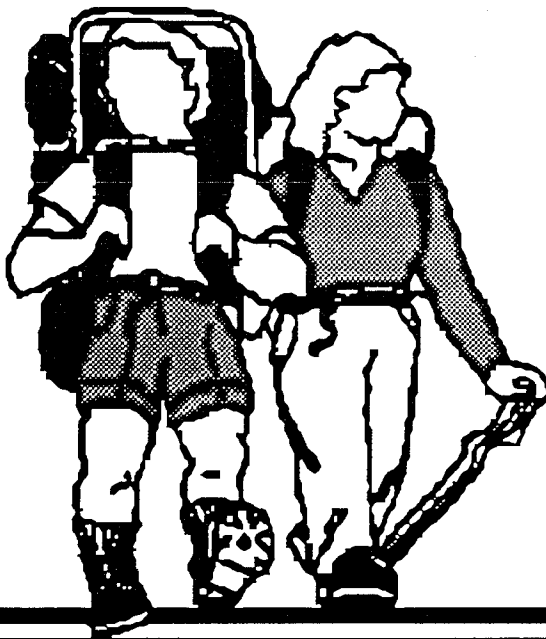
Table V-2. (Cont'd.)

Monitoring Topic	Monitoring Question	Unit of Measure	Monitoring Frequency	Precision/ Reliability	Reports Due	Annual Cost \$	Responsibility	Threshold of Variability
Silvicultural Practices	Are stands adequately restocked within three years?	Acres/years	Annual	High	3 years	\$1,200	Timber Staff	Average re-generation period less than 3.5 years
	Is precommercial and release completed according to silvicultural prescriptions?	Acres/years	Annual	High	Annual	\$600	Timber Staff	15% from prescribed levels
	Is fertilization completed on soils with demonstrated response according to silvicultural prescriptions?	Acres	Annual	High	Annual	\$200	Timber Staff	20% from prescribed levels
Silvicultural Practices (cont.)	Is genetic stock utilized for reforestation in the appropriate zone?	Trees per acre(s)	Annual	Medium	3 years	\$600	Timber Staff	25% from prescribed levels
	Are clearcuts within size limits and are objectives for variety, dispersal openings and vegetative stages effective?	Acres	Annual	High	3 years	\$400	Timber Staff	No deviation permitted. No cases where Standards and Guidelines for variety, dispersal, etc. were ineffective or not met
	Are harvest methods commensurate with Forest Plan objectives?	Acres	Annual	High	3 years	\$500	Timber Staff	Prescribed harvest methods less than +/- 25%
Lands Suitable for Timber Management	Are lands which were identified as not suitable for timber production still unsuitable? (And lands which were identified as suitable for timber production still suitable?)	Acres	5 years	High	5 years	\$2,000	Timber Staff	5% net deviation of base
Old-growth	Are acres as expected?	Acres	Annually, first 5 years, then every 5 years	High/High	Annually	2,500	Timber Staff	10% Change from expectation

Table V-2. (Cont'd.)

Monitoring Topic	Monitoring Question	Unit of Measure	Monitoring Frequency	Precision/ Reliability	Reports Due	Annual Cost \$	Responsibility	Threshold of Variability
Native Plants	Are native plant species and communities receiving adequate protection? Are introduced plant or animal species adversely impacting native plants?	Number, distribution and condition trend of sensitive or unusual species and communities.	Annually	Moderate/ Moderate	Annually	12,000	Resource Staff and Forest Botanist	No declining trend in condition and numbers

Abbreviations and Acronyms



Olympic National Forest

ABBREVIATIONS AND ACRONYMS

* Term is defined in Glossary

AA	Analysis Area *
Ac.	Acre *
ADT	Average Daily Traffic *
AF	Acre-Foot *
AMS	Analysis of the Management Situation *
ASQ	Allowable Sale Quantity *
ATV	All-Terrain Vehicle *
AUM	Animal Unit Month *
BA	Botanical Area *
BEMA	Bald Eagle Management Area *
BF	Board foot *
BIA	U.S. Bureau of Indian Affairs
BLM	U.S. Bureau of Land Management *
BMP	Best Management Practices *
BTU	British Thermal Unit *
CC	Clearcut *
CCC	Civilian Conservation Corps
CEQ	U.S. Council on Environmental Quality *
CF	Cubic Feet *
CFL	Commercial Forest Land *

CFR	U.S. Code of Federal Regulations *
CFS	Cubic feet per second
CMAI	Culmination of Mean Annual Increment *
CRM	Cultural Resource Management
CRT	Cultural Resource Technician
CSYU	Cooperative Sustained Yield Unit
CT	Commercial Thinning
DBH	Diameter at Breast Height *
DEIS	Draft Environmental Impact Statement *
DFSIM	Douglas-fir Growth and Yield Simulator
DNR	Washington State Department of Natural Resources
DOE	Washington State Department of Ecology or Department of Energy
DSEIS	Draft Supplement to the Environmental Impact Statement for an Amendment to the Pacific Northwest Regional Guide (Spotted Owl Guildlines)
EA	Environmental Analysis or Environmental Assessment *
EIS	Environmental Impact Statement *
EPA	Environmental Protection Agency *
EVC	Existing Visual Condition *
FERC	Federal Energy Regulatory Commission
FEIS	Final Environmental Impact Statement *
FIL	Fire Intensity Level *

FMAS	Fire Management Analysis System
FMEI	Fire Management Efficiency Index
FORPLAN	FOrest PLANning Model *
FSEIS	Final Supplement to the Environmental Impact Statement (See DSEIS)
FSH	Forest Service Handbook *
FSM	Forest Service Manual *
FSYU	Federal Sustained Yield Unit *
F&WL	Fish and Wildlife
GIS	Geographic Information System
GWh	Gigawatt hours (of energy).*
HCI	Habitat Capability Index *
HCRS	Heritage Conservation and Recreation Service
HCV	High Clearance Vehicle
HEI	Habitat Effectiveness Indices
HQI	Habitat Quality Index *
ICO	Issues, Concerns and Opportunities *
IDT	Interdisciplinary Team *
IPM	Integrated Pest Management *
IRAA	Integrated Resource Analysis Area *
KV	Knudson-Vanderberg
LAC	Limit of Acceptable Change *
LOD	Large Organic Debris *

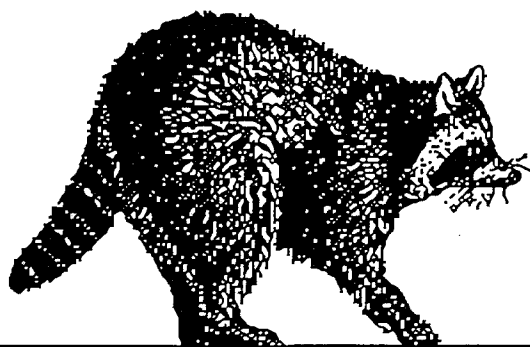
LTSYC	Long-Term Sustained Yield Capacity *
M	Modification *
M	Thousand
MAI	Mean Annual Increment *
MBF	One Thousand Board Feet
MCF	One Thousand Cubic Feet
MM	Maximum Modification *
MM	Million
MMBF	One Million Board Feet
MMCF	One Million Cubic Feet
MOU	Memorandum of Understanding *
MPN	Most Probable Number
MR	Management Requirement *
MSH	Maximum Sustained Harvest
NAS	National Accounting System
NDF	Nondeclining Flow (of timber volume) *
NEPA	(The) National Environmental Policy Act *
NF	National Forest *
NFMA	(The) National Forest Management Act *
NFS	National Forest Systems *
NOVA	Non-Highway Off-Road Vehicle Activity
NRT	National Recreation Trail *
NTU	Nephelometric Turbidity Unit
OG	Old-Growth (timber) *
ONF	Olympic National Forest

ONP	Olympic National Park
ORV	Off-Road Vehicle *
P	Preservation *
PAOT	Persons At One Time (Capacity) *
PCT	Precommercial Thinning *
PETS	Proposed Endangered, Threatened or Sensitive Species
PNV	Present Net Value *
PPM	Parts per million
PR	Partial Retention *
R	Retention *
RAM	Resource Allocation Model *
RARE II	The Second Roadless Area Review and Evaluation *
RD	Ranger District
RIM	(Forest Service) Recreation Information Management (system) *
R.M.	River Mile
RNA	Research Natural Area *
RO	Regional Forester's Office (Forest Service)
ROD	Record of Decision *
ROS	Recreation Opportunity Spectrum *
RPA	The (U.S.) Forest and Rangeland Renewable Resources Planning Act*
RVD	Recreation Visitor Day *
R/W	Right-of-Way *

S&Gs	Standards and Guidelines
SCORP	The Washington Statewide Comprehensive Outdoor Recreation Plan
SCSYU	Shelton Cooperative Sustained Yield Unit *
SHPO	Washington State Historic Preservation Officer, or the State of Washington Office of Archaeology and Historic Preservation.
SMU	Streamside Management Unit *
SO	Supervisor's Office (National Forest)
SOHA	Spotted Owl Habitat Area *
SPS	Stand Projection System
SRI	Soil Resource Inventory *
STARS	Sale Tracking and Reporting System
T&E	Threatened and Endangered Species *
T,E&S	Threatened, Endangered and Sensitive Species
TFW	Timber, Fish and Wildlife for non-Federal lands in the State of Washington
TIS	Transportation Inventory System
TSI	Timber Stand Improvement *
TSP	Total Suspended Particulates *
TSPIRS	Timber Sale Program Information Reporting System
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
VAC	Visual Absorption Capacity *
VQO	Visual Quality Objective *

WC	Working Circle *
WDF	Washington State Department of Fisheries
WDW	Washington State Department of Wildlife
WFUD	Wildlife and Fish User Day *
WIZ	Water Influence Zone *
WNH	Washington State Natural Heritage
WRS	Wilderness Resource Spectrum *
W&SRA	Wild and Scenic Rivers Act

Glossary



Olympic National Forest

GLOSSARY

Many of the definitions in this glossary are referenced to the following sources. The sources are identified by a number in parentheses following most glossary definitions. The glossary definition number corresponds to the list below. Some other terms will be referenced to Forest Service Manuals (FSM), Forest Service Handbooks (FSH), or other sources which are too numerous to list. Finally, many other definitions are not referenced, but are those in general use on the Forest.

SOURCE LIST

- (1) 36 CFR 219 National Forest Management Act Regulations.
- (2) Regional Guide for the Pacific Northwest Region, 1984.
- (3) Forestry Terminology, A Glossary of Technical Terms Used in Forestry, Society of American Foresters 1971.
- (4) The Random House College Dictionary, Revised Edition, 1975.
- (5) Webster's New International Dictionary, 1957.
- (6) Wildland Planning Glossary, Pacific Southwest Forest and Range Experiment Station, USDA Forest Service, General Technical Report PSW 13/1976.
- (7) Webster's Third New International Dictionary, 1981.
- (8) Wildlife Habitats in Managed Forests, The Blue Mountains of Oregon and Washington, 1979.
- (9) A Glossary of Terms Used in Range Management.
- (10) Forest Service Manual or Forest Service Handbook.
- (11) A Dictionary of Statistical Terms, Third Edition, M.G. Kendal and W. R. Buckland.
- (12) An Approach to Water Resources Evaluation of Non-Point Silvicultural Sources (CA Procedural Handbook), Environmental Protection Agency, Report #EPA-IAQ-D6-0660, 8/80.
- (13) Ecology Field Glossary - A Naturalists Vocabulary, Walter H. Lewis.
- (14) Eric Forsman, Consulting Wildlife Biologist, Olympia WA.
- (15) Glossary of Engineering Terms, Pacific Northwest Forest and Range Experiment Station, USDA Forest Service, 1979.
- (16) Management of Wildlife and Fish Habitats in Forest of Western Oregon and Washington, USDA Forest Service, Pacific Northwest Region, 1985.
- (17) National Forest Landscape Management, Volume 2, the Visual Management System, Chapter 1.
- (18) New American Dictionary.
- (19) Random House Dictionary of the English Language, College Edition, 1969.
- (20) Webster's New Collegiate Dictionary.

A

Abnormally heavy storms - Storms with a 10- to 100-year return period. That is, a 10-year storm occurs on the average of once every 10 years, a 20-year storm occurs on the average of once every 20 years, and so forth.

Access - Usually refers to a road or trail route over which a public agency claims a right-of-way for public use; a way of approach. (4)

Acquired lands - Lands added to the National Forest system by purchase, transfer, or donation under authority of the *Weeks Law* or related acts. Also, lands obtained by the Forest Service by exchange for other acquired lands.

Acre (Ac.) - A unit of area of land measurement equal to 43,560 square feet. (20)

Acre equivalent - Used to adjust actual acres of habitat improvement or improvement structures to reflect overall habitat benefits derived. It reflects the zone of influence of the habitat improvement for the benefiting species. (2)

Acre-foot (AF) - A measure of water or sediment volume, equal to the amount which would cover an area of one acre to a depth of one foot (i.e., 43,560 cubic feet or 325,851 gallons). (6)

Activity - An action, measure or treatment undertaken that directly or indirectly produces, enhances, or maintains forest and rangeland outputs, or achieves administrative or environmental quality objectives (FSM 1309, Management Information Handbook). An activity can generate multiple outputs. (2)

Activity fuels - Fuels generated or altered by a management activity. (10)

Administrative site - Buildings and other facilities which are used in the management of a National Forest.

Administrative unit - An area under the administration of one line officer, such as a District Ranger, Forest Supervisor, or Regional Forester. (6)

Aerial logging system - A timber yarding system employing aerial means, e.g., balloons or helicopters, to lift the log or logs. (3)

Age class - The average age of a timber stand, usually expressed in decades. (3)

Age group distribution - Age class distribution; the location and/or proportionate representation of different age classes in a forest. (3)

Airshed - A geographic area that, because of topography, meteorology, and climate, shares the same air. (2)

Allocation - See *Land Use Allocation* or *Resource Allocation*.

Allotment - Usually associated with grazing permits. A permitted area for grazing a specified number of cows, sheep, or horses for a special duration.

Allowable sale quantity (ASQ) - The quantity of timber that may be sold, from the area of suitable land covered by the Forest Plan, for a time period specified by the Plan. This quantity is usually expressed on an annual basis as the "average annual allowable sale quantity." (6) (1)

All-terrain vehicle (ATV) - A vehicle characterized by its ability to negotiate most kinds of terrain, by virtue of traction devices such as wide tracks, large, low-pressure rubber tires and/or four-wheel drive.

Alternative - One of several policies, plans, or projects proposed for decisionmaking. (2) (10)

Amenity - An object, feature, quality, or experience that gives pleasure or is pleasing to the mind or senses. The terms "amenity values" or "amenity resources" are typically used in land management planning to describe those resources for which monetary values are not or cannot be established (such as clean air and water, or scenic quality).

Anadromous fish - Those species of fish that mature in the sea and migrate into streams to spawn. Salmon, steelhead, and sea-run cutthroat trout are examples.

Analysis area (AA) - A delineated area of land subject to analysis of: (1) responses to proposed management practices in the production, enhancement, or maintenance of forest and rangeland outputs and environmental quality objectives, and (2) economic and social impacts. (FSM 1905) Tracts of land with relatively homogeneous characteristics in terms of the outputs and effects that are being analyzed in the FORPLAN model. (See FEIS Appendix B, Section entitled "Development of Analysis Areas.")

Analysis of the management situation (AMS) - A determination of the ability of the planning area to supply goods and services in response to society's demand for those goods and services. (6)

Animal Unit Month (AUM) - The amount of forage required by one mature (1,000 lb.) cow or its equivalent for one month (based upon average forage consumption of 26 lbs. dry matter per day). Animal Month is one month's use and occupancy of the range by one animal. For grazing fee purposes, it is a month's use and occupancy of range by one weaned or adult cow with or without calf, bull, steer, heifer, horse, burro, or mule, or five sheep or goats. (6)

Annual sale quantity (ASQ) - The quantity of timber that may be sold annually from the area of suitable land covered by the Forest Plan. (See also *Allowable Sale Quantity*.)

Anomalies - A deviation from the common rule, type, or form. An incongruity or inconsistency. (4)

Appropriated funds - Monies authorized by an act of Congress which permit Federal agencies to incur obligations and to make payments out of the U.S. Treasury for specified purposes.

Aquaculture - The cultivation of the natural produce of water. An example is commercial oyster cultivation. (20)

Aquatic ecosystems - Stream channels, lakes, marshes or ponds, and the plant and animal communities they support.

Aquifer - A geological formation or structure that contains water in sufficient quantity to supply needs for water development. (6)

Artifact - An object made or modified by humans. (4)

Assigned values - Monetary values given to nonmarket resources, based on estimates from comparable market transactions. For example, the benefits of dispersed recreation are given assigned monetary values for their production.

Association (wildlife) - A group of wildlife species whose requirements for habitat are satisfied by similar successional stages within given plant communities.

Available forest land - Land which has not been legislatively or administratively withdrawn by the Secretary of Agriculture or Forest Service Chief from timber production.

Average Daily Traffic (ADT) - The average 24-hour volume of traffic, being the total volume of traffic during a stated period divided by the number of days in that period. (6)

B

Background - See *Distance Zone*.

Bald Eagle Management Areas (BEMAs) - Areas managed for the protection of the bald eagle. BEMA's provide nesting, roosting and foraging habitat for the bird on each plot.

Basal area - The area of the cross-section of a tree stem near the base, generally at breast height and inclusive of bark. (3)

Base sale schedule - A timber sale schedule formulated on the basis that the quantity of timber planned for sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade, and this planned sale and harvest for any decade is not greater than the long-term sustained yield capacity. (This definition expresses the principle of nondeclining flow.) (1)

Basic resource - One of the principal resources; a resource upon which the production of other resources is dependent; e.g., the production of vegetation is dependent upon basic resources such as soils and water.

Benchmark - The analytical basis from which the alternatives were developed. The use of assessed land capability as a basis from which to estimate the effects of alternative patterns of management on the land. (6)

Benchmark - Reference points that define the bounds within which feasible management alternatives can be developed. Benchmarks may be defined by resource output or economic measures.

Benefit (value) - Inclusive terms used to quantify the results of a proposed activity, project or program expressed in monetary or nonmonetary terms. (10) Also:

1. *Direct benefit*. A primary benefit that responds to specified objectives of the policy, program, project, or expenditure. (10)
2. *Induced benefit*. A primary benefit that is incidental to the objectives of the policy, program, project, or expenditure. (10)

3. *Primary benefit.* A benefit accruing to resource owners from a primary output and that may be direct or induced or may be a residual asset. Primary benefits are components of net public benefits. (10)
4. *Secondary benefit.* A benefit accruing to parties other than the resource owners, including effects on local, Regional, and national economies and consumers. Secondary benefits are not necessarily included in net public benefits. (10)

Benefit/cost ratio - A measure of economic efficiency computed by dividing total discounted primary benefits by total discounted economic costs. (10)

Best Management Practices (BMP) - A practice or combination of practices that is determined by a State (or designated area-wide planning agency) after problem assessment, examination of alternative practices, and appropriate public participation, to be the most effective, practicable (including technological, economic, and institutional considerations) means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals (Federal Register, Volume 40, No. 230 dated 11/28/75).

Big game - Large mammals hunted for sport. On the National Forest these include animals such as deer, elk, and bear. (8)

Big game summer range - An area, usually at higher elevations, used by deer and elk during the summer. Summer ranges are usually much more extensive than winter ranges. (8)

Big game winter range - An area, usually at lower elevations, used by migratory deer and elk during the winter months; usually more clearly defined and smaller than summer ranges. (8)

Biological control - A method to control insect populations or tree diseases through the use of applied technology. Also used in noxious plant control. (3)

Biological growth potential - The average net growth attainable in a fully stocked natural forest stand. (1)

Biological potential - The maximum production of a selected organism that can be attained under optimum management. (8)

Biomass - The total quantity (at a given time) of living organisms of one or more species per unit of space (species biomass), or of all the species in a biotic community (community biomass).

Biosphere - The part of the world in which life can exist including parts of the lithosphere, hydrosphere and atmosphere. (7)

Blowdown - A tree or trees uprooted or felled by wind.

Board foot (BF) - The amount of wood equivalent to a piece of wood one foot by one foot by one inch thick. (3)

Board foot/cubic foot conversion ratio - Both board foot and cubic foot volumes can be determined for timber stands. The number of board feet per cubic foot of volume varies with tree species, diameter, height, and form factors. A specific factor by species is applied to the cubic foot FORPLAN outputs to give board foot estimates.

Botanical Area - A designated area which contains specimens or groups of plants, and plant communities which are significant because of form, color, occurrences, habitat, location, life history, arrangement, ecology, environment, rarity and/or other features.

British Thermal Unit (BTU) - The quantity of heat required to raise the temperature of one pound of water one degree Fahrenheit at or near 39.2 degrees F. (20)

Broadcast burn - A prescribed fire over a designated area within well-defined boundaries for reduction of fuel hazard or as a silvicultural treatment, or both.

Browse - Twigs, leaves, and young shoots of trees and shrubs on which animals feed; in particular, those shrubs which are used by big game animals for food. (6)

Brush - A growth of shrubs or small trees usually of a type undesirable to livestock or timber management.

Bureau of Land Management (BLM) - An agency within the Department of the Interior, with land management responsibility for the Public Domain lands.

C

Cable logging - Refers to methods used to skid or pull logs to a central landing or collection area by a cable connected to a remote power source. (6)

Canopy - The more-or-less continuous cover of branches and foliage formed collectively by the crown of adjacent trees and other woody growth. (3)

Capability - The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices at given levels of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils and geology, as well as the application of management practices, such as silviculture or protection from fire, insects, and disease. (1)

Capability area - Geographic delineations used to describe characteristics of the land and resources in integrated forest planning. Capability areas may be synonymous with ecological land units, ecosystems, or land response units. (10)

Capital formation - Used in IMPLAN as the value of purchases from sectors both inside and outside the Region by individuals, governments, and industries in the area as investment (land, plant, and equipment used in production processes). (10)

Capital Investment - Activities that create or improve capital assets for desired benefits during several planning periods. (10)

Carrying capacity - 1) The number of organisms of a given species and quality that can survive in, without causing deterioration of, a given ecosystem through the least favorable environmental conditions that occur within a stated interval of time. 2) In recreation, refers to the number of people that can occupy an area for a given social and experience goal. 3) In range, refers to the maximum stocking rate possible on a given range without causing deterioration to vegetation or related resources. (3)

Cavity - The hollow excavated in trees by birds or other natural phenomena; used for roosting, food storage, and reproduction by many birds and mammals. (2)

Cavity-dependent species - A wildlife species that digs or chips out cavities in wood to provide itself or its mate with a site for nesting, roosting, or foraging. (16)

Channel or stream scour - Erosion of the channel bottom caused by high flows of water, loss of channel stability, or debris torrents.

Characteristic landscape - In reference to the USDA Forest Service visual management system; the overall impression created by a landscape's unique combination of visual features (land, vegetation, water, structures), as seen in terms of form, line, color and texture; synonymous with "visual landscape character." (6)

Chargeable volume - All timber volume included in the growth and yield projections for the selected management prescriptions used to arrive at the allowable sale quantity, based on regional utilization standards. (10)

Clearcut (CC) - The cutting method that describes the silviculture system in which the old crop is cleared over a considerable area at one time. Regeneration then occurs from (a) natural seeding from adjacent stands, (b) seed contained in the slash or logging debris, (c) advance growth, or (d) planting or direct seeding. An even-aged forest usually results. (3)

Climatic regimes - A generalized climatic classification which applies to a specific land area; generally that area can be expected to experience that kind of climate in any given year.

Climax - The culminating stage in plant succession for a given site where the vegetation has reached a highly stable condition. (6)

Climax species - Those species that dominate a climax stand in either numbers per unit area or biomass.

Closure - An administrative order restricting either location, timing, or type of use in a specific area.

Coastal Douglas-Fir Zone - The area west of the crest of the Cascade Mountain Range in the States of Oregon and Washington.

Code of Federal Regulations (CFR) - A codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal Government. (1)

Commercial Forest Land (CFL) - 1. Historical use in Timber Management (TM) Plans: Forest land that is capable of producing commercial crops of wood not withdrawn from timber use by statute or administrative regulation; includes areas suitable for management to grow crops of industrial wood and generally capable of producing in excess of 20 cubic feet per acre of annual growth; includes both accessible and prospectively accessible areas and both operable and prospectively operable areas. 2. Definition in revised TM Handbook: Land that is producing, or is capable of producing, crops of industrial wood and (1) has not been withdrawn by Congress, the Secretary of Agriculture, or the Chief of the Forest Service; (2) land where existing technology and knowledge is available to ensure timber production without irreversible damage to soil productivity or watershed conditions; and (3) land where existing technology and knowledge, as reflected in current research and experience, provides reasonable assurance that adequate restocking can be obtained within 5 years after final harvesting.

Commercial thinning - Any type of tree thinning that produces merchantable material at least equal in value to the direct costs of harvesting. (3)

Commodities - A transportable resource with commercial value; all resource products that are articles of commerce. (6)

Common varieties - Nonmineralized sand, gravel, stone, etc. (See *Mineral Materials*.)

Community Cohesion - The degree of unity and cooperation evident in a community as it defines problems and attempts to resolve them. (10)

Community Group - An aggregation of individual communities having similar types and patterns of lifestyle and values related to Forest management.

Community stability - A community's capacity to handle change without major hardships or disruptions to component groups or institutions. Measurement of community stability requires identification of the type and rate of proposed change and an assessment of the community's capacity to accommodate that level of change. (10)

Compaction - The packing together of soil particles by forces exerted at the soil surface, resulting in increased soil density.

Composite - A reference to special planning areas designated under the Land and Water Conservation Act of 1965; an area identified for unique recreation and/or fish and wildlife values.

Composite Plan - A documented analysis which, at one time was required to justify the use of Land and Water Conservation Funds for acquisition of private lands within a designated composite.

Concern - A point, matter, or question raised by management that must be addressed in the planning process.

Condition class - 1) Timber: a grouping of timber strata into size-age-stocking classes for Forest planning. 2) Range: one of a series of arbitrary categories used to classify range conditions, usually expressed as excellent, good, fair, or poor. (9)

Congressionally Classified and Designated Areas - Areas that require congressional enactment for their establishment, such as Wildernesses, National Wild and Scenic Rivers, and National Recreation Areas.

Conifer - A tree belonging to the most important order of the Gymnospermae, comprising a wide range of trees that are mostly evergreens. Conifers bear cones (hence coniferous) and needle-shaped or scale-like leaves and produce timber known commercially as softwood. (3)

Constraint - In FORPLAN, a limit (either ceiling or floor) which may be placed on the level of inputs to or outputs from a forest.

Consumptive use - A use of resources that permanently reduces the supply, such as mining. (See also *Nonconsumptive Use*). (6)

Conversion period - The duration of a change from one silvicultural system to another or from one tree species to another. (3)

Core area - An area (as related to the spotted owl) encompassing at least 300 contiguous acres of old growth suitable for nesting and reproduction. The area consists of a pair's territory, in part, the nest site, and principal roost areas.

Corridor - A linear strip of land identified for the present or future location of transportation or utility rights-of-way within its boundaries. (1)

Cost, capital investment - The cost of manmade structures, facilities, or improvements in natural resources used as inputs in production processes to produce outputs over one or more planning periods. (FSM 1905)

Cost-effective - Achieving specified outputs or objectives under given conditions for the least cost. (6)

Cost-efficiency - The usefulness of specified inputs (costs) to produce specified outputs (benefits). In measuring cost efficiency, some outputs, including environmental, economic, or social impacts, are not assigned monetary values, but are achieved at specified levels in the least costly manner. Cost efficiency is usually measured using present net value, although use of benefit-cost ratios and internal rate-of-return may be appropriate. (1)

Costs -

1. *Direct cost.* A cost that directly contributes to the production of primary outputs of an activity, project, or program. (10)
2. *Economic cost.* Total fixed and variable costs for inputs, including costs incurred by other public parties and, if appropriate, opportunity costs and cost savings. (10)
3. *Fixed cost.* A cost that is committed for the time horizon of planning or the decision being considered. Fixed costs include fixed ownership requirements, fixed protection, short-term maintenance, and long-term planning and inventory costs. (10)
4. *Investment cost.* A cost of creating or enhancing capital assets, including costs of administrative or common-use transport facilities and resource management investments. (10)
5. *Joint cost.* A cost contributing to the production of more than one type of output. (10)
6. *Non-Forest Service cost.* A cost of investment and operating activities paid by cooperators or other non-Forest Service agencies which are part of Forest Service management programs, or which contribute to the outputs included in the analysis. (10)
7. *Opportunity cost.* The value of a resource's foregone net benefits in its most economically efficient alternative use. (10)
8. *Unit cost or cost per unit.* Total cost of production divided by the number of units produced. (10)
9. *Variable cost.* A cost that varies with the level of controlled outputs in the time horizon covered by the planning period or decisions being considered. (10)

Cost sensitivity analysis - A type of analysis done to estimate how a particular problem's solution would change if the costs were increased or decreased.

Council on Environmental Quality (CEQ) - An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters. (Abstracted from the National Environmental Policy Act of 1969, as Amended.)

Cover/forage ratio - The mixture of cover and forage areas on a unit of land, expressed as a ratio.

Created opening - An opening in the Forest created by the silvicultural practices of: final removal harvest of shelterwood; clearcutting; seed tree cutting; or group selection cutting. (2)

Crown height - In a standing tree, the vertical distance from ground level to the base of the crown, measured either to the lowest live branch whorl, or to the lowest live branch (excluding shoots arising spontaneously from buds on the stem of a woody plant), or to a point halfway between. (3)

Cubic foot (CF) - The amount of timber (or water) equivalent to a piece of wood (or water) one foot by one foot by one foot. (3)

Culmination of mean annual increment (CMAI) - The age at which average annual growth is greatest for a stand of trees. Mean annual increment is expressed in cubic feet measure, and is based upon expected growth according to the management intensities and utilization standards assumed in accordance with 36 CFR 219.16(a)(2)(i) and (ii). Culmination of mean annual increment includes regeneration harvest yields and any additional yields from planned intermediate harvests. (10)

Cultural resource - The remains of sites, structures, or objects used by humans in the past--historic or prehistoric. (2)

Cumulative effects or impacts - Cumulative effect or impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR 1508.7 - these regulations use effects and impacts synonymously.)

Current Direction Alternative - This term is often used interchangeably with the "No Action" Alternative required by the National Environmental Policy Act. It is Alternative A in this EIS.

Cutting cycle - The planned lapse of time between successive cuttings in a stand. (6)

D

Data - Any recorded measurements, facts, evidence, or observations reduced to written, graphical, tabular, or computer form. The term implies reliability, and therefore provides an explanation of source, type, precision and accuracy. (6)

Debris slide - A shallow landslide of soil, rock, and organic material that occurs on steep slopes.

Debris torrent - A large debris slide that is charged with water and confined to a steep stream channel. Debris torrents may travel several thousand feet.

Decadent (stands) - Decaying; deteriorating. (4)

Decision Criteria - Essentially the rules or standards used to evaluate alternatives. They are measurements of indicators that are designed to assist a decisionmaker in identifying a preferred choice from an array of possible alternatives.

Deer winter range - See *Big Game Winter Range*.

De facto outputs - Resource outputs produced from lands not necessarily being managed or allocated for the specific production of these outputs. De facto resource outputs are most commonly recreation and wildlife opportunities. For example, an area may not be allocated to emphasize recreation management and, in fact, may be scheduled for timber harvest in a later decade. However, the area can usually continue to provide recreation opportunities until it is entered for harvesting.

De facto supply - In dispersed recreation, those acres that are available for timber harvests but not entered.

Demand - The amount of an output that users are willing to take at a specified price, time period, and condition of sale. (10)

Demand Analysis - A study of the factors affecting the schedule of demand for an output, including the price-quantity relationship, if applicable. (10)

Department of Energy (DOE) - A department of the Executive branch of the Federal Government which oversees national matters involving the development and use of energy.

Departure - A schedule which deviates from the principle of nondeclining flow by exhibiting a planned decrease in the timber sale and harvest schedule at any time in the future. (10)

Dependent communities - Communities whose social, economic, or political life would change in important respects if market or nonmarket outputs from the National Forests were substantially altered.

Designated Area (Air Quality) - Those areas delineated in the Washington Smoke Management Plan as centers of air quality concern.

Design standard - Approved design and construction specifications used mainly for recreation facilities and roads--includes specified materials, colors, dimensions, etc.

Desirable residual vegetation - The remaining vegetation after application of harvest cutting methods that meets management area objectives. The vegetation may be trees, shrubs, grass, or a combination.

Developed recreation - Recreation that requires facilities that, in turn, result in concentrated use of an area. Examples of developed recreation areas are campgrounds and ski areas; facilities in these areas might include roads, parking lots, picnic tables, toilets, drinking water, ski lifts, and buildings. (2)

Developed recreation site - Relatively small, distinctly defined areas where facilities are provided for concentrated public use; e.g., campgrounds, picnic areas, swimming areas, and downhill ski areas. (6)

Developed Site Management Schedule - A document identifying management direction for operating and maintaining developed recreation sites and their facilities.

Diameter at breast height (DBH) - The diameter of a tree measured 4 feet 6 inches above the ground. (6)

Discount rate - An interest rate that represents the cost or time value of money in determining the present value of future costs and benefits. A "real" discount rate is one adjusted to exclude the effects of inflation. (6) (10)

Discounting - An adjustment, using a discount rate, for the value of money over time so that costs and benefits occurring in the future are reduced to a common time, usually the present, for comparison. (6)
FSM 1905

Dispersed recreation - Synonymous with undeveloped recreation. A general term referring to recreation use outside developed recreation sites; this includes activities such as scenic driving, hiking, backpacking, hunting, fishing, snowmobiling, horseback riding, cross-country skiing, and recreation in primitive environments. (2)

Distance zone - One of three categories used in the Visual Management System to divide a view into near and far components. The three categories are:

1. *Foreground* - The visible terrain between the observer and middleground. The detailed landscape found within 0 to 1/4 to 1/2 mile from the observer. (6)

2. *Middleground* - The visible terrain between the foreground and background. The area located from 1/4 to 1/2 to 3 to 5 miles from the observer. (6)

3. *Background* - The visible terrain beyond the middleground where individual trees are not visible, but are blended into the total fabric of the stand. The view beyond 3 to 5 miles from the observer, and as far as the eye can detect objects. (6)

Diversity - The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan. (2) (1)

Doghair stand - Excessively overstocked and stagnated timber stands occupying substantial areas of potentially productive forest land on the east side of the Olympic National Forest.

Douglas-fir Type - An association of tree species in which Douglas-fir is recognized as one of the principal seral species.

Draft Environmental Impact Statement (DEIS) - The draft statement of environmental effects which is required for major federal actions under Section 102 of the National Environmental Policy Act, and released to the public and other agencies for comment and review. (6)

Dry Ravel - The slow to very rapid gravity driven movement of dry soil. Dry ravel usually occurs when the organic materials in the surface layers of the soil are severely altered by fire. Dry ravel occurs most likely where soils are medium to coarse textured and slopes are over 60 percent gradient.

Duff - Organic matter in various stages of decomposition on the floor of the forest. (4)

E

Early forest succession - The early stage or condition of a plant community that occurs during its development from bare ground to climax. (6)

Eastside Zone - The portion of the Olympic National Forest that includes the Hood Canal and Quilcene Ranger Districts.

Economic efficiency - The usefulness of inputs (costs) to produce outputs (benefits) and effects when all costs and benefits that can be identified and valued are included in the computations. Economic efficiency is usually measured using present net value, though use of benefit-cost ratios and rates-of-return may sometimes be appropriate. (10)

Economic growth - Increased economic output in real terms over time. (6)

Economic Impacts -

1. *Direct economic impact.* Effects caused directly by forest product harvest or processing or by forest uses. (10)
2. *Indirect economic impact.* Effects that occur when supporting industries sell goods or services to directly affected industries. (10)
3. *Induced economic impact.* Effects that occur when employees or owners of directly or indirectly affected industries spend their income within the economy. (10)

Ecosystem - An interacting system of organisms considered together with their environment; for example, marsh, watershed, and lake ecosystems. (2)

Edge - An area where plant communities meet or where successional stages or vegetation conditions within the plant communities come together. (2)

Effects - Environmental changes resulting from a proposed action. Included are direct effects, which are caused by the action and occur at the same time and place, and indirect effects, which are caused by the action and are later in time or further removed in distance, but which are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density, or growth rate, and related effects on air and water and other natural systems, including ecosystems.

Effects and impacts as used in this FEIS are synonymous. Effects include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic quality, historic, cultural, economic, social, or healthy effects, whether direct, indirect, or cumulative. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if on balance the agency believes that the effects will be beneficial. (40 CFR 1508.8, 2)

Electronic sites - Formally-designated areas of National Forest System land suitable for the location of electronic communication equipment. Equipment may include: receive-only passive reflectors, antennas, satellite dishes, etc., or transmit/receive facilities for two-way radio, microwave, and AM-FM broadcast characterized by continuous transmission when operating.

Employment - Labor input into a production process, measured in the number of person-years or jobs. A person-year is 2,000 working hours by one person working year long or by several persons working seasonally. (10)

Endangered species - Any species of animal or plant that is in danger of extinction throughout all or a significant portion of its range. Plant or animal species identified by the Secretary of the Interior as endangered in accordance with the 1973 Endangered Species Act. (6)

Endemic Plant - A plant confined to a certain country or region and with a comparatively restricted geographic distribution.

Ending Inventory Constraint - The standing volume left in the inventory at the end of the planning horizon. The constraint insures that there is enough standing inventory at the end of the planning horizon to perpetuate long-term sustained yield capacity harvest levels on a nondeclining flow basis.

Enhancement - A short-term management practice having the specific purpose of increasing the positive aspects of a resource, such as enhancing scenic variety where little variety now exists.

Environment - The aggregate of physical, biological, economic, and social factors affecting all organisms in an area.

Environmental Analysis (EA) - A comprehensive evaluation of alternative actions and their predictable short- and long-term environmental effects, which include physical, biological, economic, social, and environmental design factors and their interactions. (2)

Environmental Assessment (EA) - The concise public document required by the regulations for implementing the procedural requirements of the National Environmental Policy Act. (40 CFR 1508.9, 2)

Environmental Consequences - The effects upon a given environment as a result of a proposed action.

Environmental Impact Statement (EIS) - A statement of the environmental effects of a proposed action and alternatives to it. It is required for major federal actions under Section 102 of the National Environmental Policy Act (NEPA), and released to the public and other agencies for comment and review. It is a formal document that must follow the requirements of NEPA, the Council on Environmental Quality (CEQ) guidelines, and directives of the agency responsible for the project proposal. (6)

Environmental Protection Agency (EPA) - An agency of the Executive Branch of the Federal Government which has the responsibility for environmental matters of national concern.

Ephemeral draw - A drainage way which conveys surface water for short periods of time in direct response to snowmelt or rainfall runoff.

Erosion - (1) The wearing away of the land surface by running water, wind, ice, or other geologic agents, including such processes as gravitation creep; or (2) detachment and movement of soil or rock fragments by water, wind, ice, or gravity. The following terms are used to describe different types of erosion:

Accelerated Erosion - Erosion which is much more rapid than natural erosion, with the increase in erosion rate resulting primarily from the influence of human activities, or, in some cases, of other events that expose mineral soil surfaces, such as wildfire.

Gully erosion - The erosion process whereby water accumulates in narrow channels, and over short periods, removes the soil from this narrow area to considerable depths, ranging from 4 inches to as much as 75 to 100 feet.

Rill erosion - An erosion process in which numerous small channels less than 4 inches deep and 6 inches wide are formed.

Sheet erosion - The removal of a fairly uniform layer of soil from the land surface by runoff water.

Erosion Hazard Rating - A rating system (low, medium, and high) which denotes the susceptibility of a land area to surface and mass wasting erosional processes.

Escapement - The numbers of adult anadromous fish that successfully escape commercial and sport fishing pressure and return to their streams of origin to spawn.

Estuary - A semiclosed body of water which has a free connection with the open sea. The sea water in an estuary is measurably diluted with fresh water from streams, rivers, or ground water.

Eutrophic - Of habitats, particularly soils and water, that are rich or adequate in nutrients. (3)

Even-aged management - The application of a combination of actions that results in the creation of stands in which trees of essentially the same age grow together. Managed even-aged forests are characterized by a distribution of stands of varying ages (and, therefore, tree sizes) throughout the forest area. The difference in age between trees forming the main canopy level of a stand usually does not exceed 20 percent of the age of the stand at harvest rotation age. Regeneration in a particular stand is obtained during a short period at or near the time that a stand has reached the desired age or size for regeneration and is harvested. Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands. (1)

Even-aged stands - Stands in which all trees are about the same age. (A spread of 10 to 20 years is generally considered one age class.) Cutting methods producing even-aged stands are clearcut, shelterwood, or seed tree systems.

Exchange reserved - Lands which have been added to the National Forest System by exchange under the General Exchange Act for reserved/proclaimed National Forest System Lands.

Existing visual condition (EVC) - An inventory of existing visual impacts as seen from sensitive travel corridors or use areas; measures visual changes to the landscape caused by natural or human activities.

Exports - As used in IMPLAN are defined as outputs or products produced but not consumed or used in production of other outputs in the impact area. Includes both exports to other areas of the U.S. and international exports. (10)

Extended rotation - A period of years that is longer than the time necessary to grow timber crop to a specified condition of maturity. (3)

Extensive forest management - A low investment level of management on regulated timberlands that requires initial harvest, regeneration, and final harvest. Some precommercial thinning may be done to prevent stagnation and disease buildup.

F

Facility Condition Class Inventory - A Recreation Information Management (RIM) system for classifying the existing condition of recreation facilities.

Fault - A ground surface fracture or fracture zone along which there has been a displacement of one side with respect to the other. (6)

Fault scarp - An abrupt change in surface elevation resulting from earthquake activity. Fault scarps may vary from as little as a few inches to two or three thousand feet.

Federal Sustained Yield Unit (FSYU) - A Federal timber management unit established under the authority of the Sustained Yield Forest Management Act of 1944.

Fee Site - A developed recreation site in which the visitor is charged a user fee for overnight camping. The amount of the fee will vary from site to site depending on the facilities and services provided.

Feral - Non-native species, or their progeny, which were once domesticated but have since escaped from captivity and are now living free. (6)

Final cut - See *Final Removal Harvest*.

Final Environmental Impact Statement (FEIS) - The final version of the statement of environmental effects required for major federal actions under section 102 of the National Environmental Policy Act. It is a revision of the draft environmental impact statement to include public and agency responses to the draft. (6)

Final removal harvest - The removal of the last seed bearers or shelter trees after regeneration is established under a shelterwood system. (6)

Fire management - All activities required for protection of resources from fire and for the use of fire to meet land management goals and objectives. (6)

Fire Intensity Level (FIL) - An expression of the amount of energy released as fuel is consumed in a fire.

Fire suppression - Action to limit the spread of and/or prevent damage by wildfire.

Fisheries habitats - Streams, lakes, and reservoirs that support fish populations.

Flood plain - The lowland and relatively flat area adjoining inland waters, including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year. (2)

Forage - All browse and nonwoody plants that are available to livestock or game animals and used for grazing or harvested for feeding. (6)

Forb - Any herb other than grass. (7)

Foreground - See *Distance Zone*.

Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) - An Act of Congress requiring the preparation of a program for the management of the National Forests' renewable resources, and the

preparation of land and resource management plans for units of the National Forest System. It also requires a continuing inventory of all National Forest System lands and renewable resources. (6)

Forest land - Land at least 10 percent occupied by forest trees or formerly having had such tree cover and not currently developed for nonforest use. Lands developed for nonforest use include areas for crops, improved pasture, residential, or administrative areas, improved roads of any width, and adjoining road clearings and powerline clearings of any width. (1) (10)

Forest Program - A forest program is the summary or aggregation of project or activity information that makes up an integrated (multifunctional) course of action for a given level of funding on a national forest that is consistent with the Forest plan.

Forest Service Handbook (FSH) - For Forest Service use, directives that provide detailed instructions on how to proceed with a specialized phase of a program or activity. (10)

Forest Service Manual (FSM) - A system of manuals which provides direction for Forest Service activities.

Forest succession - The orderly process of change in a forest as one plant community or stand condition is replaced by another, evolving towards the climax type of vegetation. (16)

Forest system roads - Roads that are part of the Forest development transportation system, which includes all existing and planned roads as well as other special and terminal facilities designated as Forest development transportation facilities. (See *Arterial Roads*, *Collector Roads*, and *Local Roads*.)

Forest type - A classification of forest land based upon the tree species presently forming a plurality of basal area stocking in live trees.

Formally dedicated area - An area of the Forest set aside for a specific use by virtue of a formal ceremony or congressional designation.

FORPLAN - A linear programming system used for developing and analyzing forest planning activities. (10)

Free-to-grow - A term used by silviculturists to indicate that trees are free of growth restraints, the most common of which is competing, over-topping vegetation.

Fuel break - A zone in which fuel quantity has been reduced or altered to provide a position for suppression forces to make a stand against wildfire. Fuel breaks are designated or constructed before the outbreak of a fire. Fuel breaks may consist of one or a combination of the following: natural barriers, constructed fuel breaks, constructed barriers. (6)

Fuel management - The practice of planning and executing the treatment or control of living or dead vegetative material in accordance with fire management direction. (10)

Fuel treatment - The rearrangement or disposal of natural or activity fuels (generated by management activity, such as slash left from logging) to reduce fire hazard. Fuels are defined as both living and dead vegetative materials consumable by fire.

Fuels - Combustible wildland vegetative materials. While usually applied to above ground living and dead surface vegetation, this definition also includes roots and organic soils such as peat. (10)

Fuelwood - Wood which is primarily used by residential homeowners for heating purposes.

Full cable suspension - A cable yarding system capable of lifting and transporting logs above the ground and vegetation to a landing, resulting in minimum disturbance to the environment. Not all cable yarding systems have this capability. (16)

Full-service management - Management of developed recreation sites to furnish the full range of amenities and maintenance for the public enjoyment. Management objectives are based on site capacity, site protection needs, seasonal demands for public use, and desired levels of service to enhance visitor's experience and convenience and provide optimum maintenance.

Furbearing species - See *Game Species*.

G

Game species - Any species of wildlife or fish for which seasons and bag limits have been prescribed and which are normally harvested by hunters, trappers, and fishermen under state or federal laws, codes, and regulations. (6)

Genetic seedlings - Tree seedlings from a genetically superior seed source. The seeds are collected from trees displaying exceptional form and raised in nurseries before outplanting. The seedlings usually have faster growth rates than naturally regenerated seedlings.

Genetic tree improvement - A general term including all practices designed to produce genetically better trees, such as forest tree breeding, selection and protection of superior seed trees. (3)

Genetic Integrity - Refers to a normal, healthy genetic pool (foundation) within a biological population to provide for long-term maintenance and survival of the species. Of specific concern in management direction is the prevention of loss of genetic variance (heterozygosity) and the avoidance of inbreeding depression, an important part of a given population's genetic integrity within the gene pool. (2)

Geomorphology - The science that deals with land and submarine relief features of the Earth's surface and seeks a genetic interpretation of them, using the principles of physiography in its descriptive aspects and dynamic and structural geology in its explanatory phases. (6)

Geothermal - Of or pertaining to the internal heat of the earth. (4)

Gigawatt hour (GWh) - A unit of energy equal to 1 billion watt hours.

Goal - A concise statement that describes a desired condition to be achieved sometime in the future. It is normally expressed in broad, general terms and is timeless in that it has no specific date by which it is to be completed. Goal statements form the principal basis from which objectives are developed. (2) (1)

Goods -

1. **Nonmarket good.** An output that is not normally exchanged for money in a market. Usually no market has evolved because ownership of the good is not clear, exclusive use is not possible under current laws, or it is not possible to consistently define good. (10)

2. **Public good.** An output for which it is impractical to impose a charge, either because it must be supplied to all if it is supplied to one or because the costs of collection and control exceed likely revenue. (10)

Goods and services - The various outputs, including on-site uses, produced from forest and rangeland resources. (2,1)

Grass/forb - An early forest successional stage where grasses and forbs are the dominant vegetation.

Grays Harbor Federal Sustained Yield Unit - Includes all National Forest land managed by the Quinault Ranger District. At present, 50 percent of the timber harvested from the District must receive primary manufacturing within Grays Harbor County.

Group selection cutting - See *Uneven-Aged Silvicultural Systems*.

Growing season - That part of the year when temperature and moisture are favorable for vegetation growth.

Guideline - An indication or outline of policy or conduct; i.e., any issuance that assists in determining the course of direction to be taken in any planned action to accomplish a specific objective. (2)

H

Habitat - The place where a plant or animal naturally or normally lives or grows. (2)

Habitat capability - The estimated ability of an area, given existing or predicted habitat conditions, to support a wildlife, fish or plant population. It is measured in terms of potential population numbers.

Habitat Capability Index (HCI) - A numerical expression of habitat capability measured in terms of potential population numbers.

Habitat diversity - The distribution and abundance of different plant and animal communities and species within a specific area.

Habitat Quality Index (HQI) - A numerical estimate of habitat quality expressed as a percentage of optimum.

Hardwood - A broad-leaved flowering tree.

Harvest cutting method - A combination of interrelated actions whereby forests are tended, harvested, and replaced. The combination of management practices used to manipulate the vegetation results in forests of distinctive form and character. Harvest cutting methods are classified as even-aged and uneven-aged.

Harvest dispersion (factor) - The dispersion of cutting units over the land base in order to meet clearcut size limitations, or other resource constraints. An example of a harvest dispersion constraint is: no more than 25 percent of an analysis area may be harvested in one decade.

Headwaters - The upper tributaries of a river. (4)

Herbaceous - An adjective describing seed-producing plants that do not develop persistent woody tissue, but die down to ground level at the end of the growing season.

Herbicide - An agent used to destroy or inhibit plant growth. (20)

Hiding cover - Vegetation that will hide 90 percent of an adult deer or elk from the view of a human at a distance of 200 feet or less. The distance at which the animal is essentially hidden is called a "sight distance."

High-lead logging - A system of cable logging wherein the main lead block is placed on a spar tree, generally 100 to 125 feet above the ground, giving a lifting effect to the incoming logs.

High-site timbered lands - A relative measure of resource productivity.

Hog fuel - Waste wood shredded into bits to be utilized as fuel. (3--Definition modified)

Human Resource Programs - Programs providing human and natural resource benefits through work, training, and education for the unemployed, the underemployed, the elderly, the young and others with special needs.

Hydrology - The scientific study of the properties distribution and effects of water in the atmosphere, on the earth's surface, and in soil and rocks.

Hydropower - Hydroelectric power; of or relating to production of electricity by waterpower. (20)

I

ID Team - See *Interdisciplinary Team*.

Impacts - See *Effects*.

IMPLAN - A computer-based system used by the Forest Service for constructing nonsurvey input/output models to measure economic input. The system includes a data base for all countries in the U.S. and a set of computer programs to retrieve data and perform the computational tasks for input/output analysis. (10)

Imports - Used in IMPLAN and defined as purchases of products for use in production of other products and for final consumption from outside the impact area. Includes both imports from other areas of the U.S. and international imports. Competitive imports are the same as local domestic products which are not produced in quantities sufficient to meet local demands or which obtain a share of the local market formerly supplied by local producers. Noncompetitive imports are products not produced locally. (10)

Improved genetic stock - Group of plants (trees) that have been improved genetically (4).

Income - Employee compensation, profits, rents, and other payments to households. (10)

Indicator species - See *Management Indicator Species*.

Indirect outputs - Outputs caused by an action, but which are later in time or farther removed in distance, although still reasonably foreseeable. (See *Effects*.)

Individual (single) tree selection - See *Uneven-Aged Silvicultural Systems*.

Induced outputs - Outputs in the private sector induced by the direct outputs produced on the Forest. (6)

Influence zone - See *Zone of influence*.

Input/output analysis - A quantitative study of the interdependence of a group of activities, based on the relationship between inputs and outputs of the activities. The basic tool of analysis is an input-output model for a given period that shows simultaneously for each economic sector the value of inputs and outputs, as well as the value of transactions within each economic sector. It has especially been applied to estimate the effects of changes in Forest output levels on local economic activity. (3)

Insecticide - A pesticide for control of insects. (16)

Instream flows - A prescribed level (or levels) of streamflow, usually expressed as a stipulation in a permit authorizing a dam or water diversion, for the purpose of meeting National Forest System management objectives.

Integrated pest management (IPM) - A process for selecting strategies to regulate forest pests in which all aspects of a pest-host system are studied and weighed. The information considered in selecting appropriate strategies includes the impact of the unregulated population on various resource values, alternative regulation tactics and strategies, and benefit/cost estimates of those alternative strategies. Regulatory strategies are based on sound silvicultural practices and ecology of the pest-host system, and consist of a combination of tactics such as timber stand improvement plus selective use of pesticides. A basic principle in the choice of strategy is that it be ecologically compatible or acceptable. (2) (1)

Integrated Resource Analysis Areas (IRAA) - An area of the Forest, generally defined by watershed or basin boundaries, which is used for planning, analysis, and scheduling of project activities.

Integrated resource management - A management strategy which emphasizes no resource element to the exclusion or violation of the minimum legal standards of others. (FSM 1905)

Intensive management (Intensive forest management) - A high investment level of timber management that includes use of precommercial thinnings, commercial thinnings, genetically improved stock, and control of competing vegetation. (2)

Interdisciplinary Team (IDT) - A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of recognition that no one scientific discipline is sufficiently broad to adequately solve the problem. (6)

Intermediate cutting - Any removal of trees from a stand between the time of its formation and the regeneration cut. Most commonly applied intermediate cuttings are release, thinning, improvement, and salvage. (6)

Intermingled ownerships - Lands that are owned by private interests or other government agencies and located within the National Forest boundaries or surrounded by National Forest land.

Intermittent stream - A stream with running water in most months, but without water in the summer season during most years.

Intertile - A link between two points, objects, or concepts. (5)

Inventory data and information collection - The process of obtaining, storing, and using current inventory data appropriate for planning and managing the Forest. (6)

Irretrievable - Applies to losses of production, harvest, or commitment of renewable natural resources. For example, some or all of the timber production from an area is irretrievably lost during the time an area is used as a winter sports site. If the use is changed, timber production can be resumed. The production lost is irretrievable, but the action is not irreversible. (10)

Irreversible - Applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors that are renewable only over long time spans, such as soil productivity. Irreversible also includes loss of future options. (10)

Issue - A point, matter, or question of public discussion or interest to be addressed or decided through the planning process. (See also *Public Issue*.) (2)

L

Land allocation - The assignment of management emphases to particular land areas with the purpose of achieving goals and objectives of a specific alternative.

Land and Water Conservation Fund (L&WCF) - Funds collected from sales of surplus Government real property, motorboat fuels taxes, recreation use fees, etc. which are available to purchase and develop certain qualifying lands for recreational purposes.

Land class - The topographic relief of a unit of land. Land classes are separated by degrees of slope, and is a classification system used in the timber inventory process. The three land classes used in the Olympic National Forest Plan are defined by the following slope ranges: 0 to 40 percent; 40 to 60 percent; and greater than 60 percent.

Land exchange - The acquisition of non-Federal land and/or interests in exchange for National Forest System land or interests.

Landform - An area of that is defined by its particular combination of bedrock and soils, erosion processes and climatic influences.

Landing - Any place where round timber is handled and assembled for further transport. (3)

Land management - The intentional process of planning, organizing, programming, coordinating, directing, and controlling land use actions. (6)

Landownership pattern - The National Forest System resource land base, in relation to other land ownerships within given boundaries. (2)

Landscape management - The art and science of planning the use of Forest lands in ways that visual resource values are protected or enhanced. The planning and design of the visual aspects related to multiple-use land management.

Lands not appropriate for timber production - Includes lands that: 1) are proposed for resource uses that preclude timber production, such as Wilderness; 2) have other management objectives that limit timber production to the point where management requirements set forth in CFR 219.27 cannot be met; or, 3) are not cost efficient over the planning horizon in meeting forest objectives including timber production. (1)

Lands not suited (unsuitable) for timber production - Includes lands that: 1) are not forest land as defined in CFR 219.3; 2) are likely, given current technology, to suffer irreversible resource damage to soils productivity, or watershed conditions; 3) cannot be adequately restocked as provided in 36 CFR 219.27(c)(3); or, 4) have been withdrawn from timber production by an Act of Congress, the Secretary of Agriculture, or the Chief of the Forest Service. In addition, Forest lands in alternatives that are otherwise suited (items 1,2,3 and 4), but are located in Management Areas with prescriptions that preclude management timber production, such as Wilderness or Research Natural Areas.

Lands suitable for timber production - Includes all lands not classified as either Not Suited or Not Appropriate for Timber Production.

Landtype - A portion of the Forest mapped in the National Forest Soil Resource Inventory that has a defined arrangement of specific landforms that reacts to management activities in generally predictable ways. Landtypes range from 60 to 600 acres in size.

Landtype association - A group of landtypes that make up a large portion of the Forest. The landtypes are sufficiently homogeneous to be considered as a whole for modeling the future outputs and effects of planned management activities. Landtype Associations do not usually follow watershed boundaries and are defined on the basis of general similarities in geology, climate, landform and vegetation.

Land use allocation - The commitment of a given area of land or a resource to one or more specific uses--for example, to campgrounds or wilderness. (6)

Large organic debris (LOD) (Large woody debris) - Large downed trees, primarily conifers, that accumulate on land or in streams or other water bodies. This material is important for wildlife and fishery habitat and stream channel stability.

Large saw timber - A stand condition in which the average tree diameter exceeds 21 inches DBH.

Leasable minerals - Coal, gas, oil, phosphate, sodium, potassium, oil shale, sulphur, geothermal steam. Also includes other minerals on acquired National Forest lands. (6)

Least-cost analysis - Determination of the least cost means of attaining specified results. (10)

Level IV Law Enforcement Officer - A Forest Service employee who has graduated from the Federal Law Enforcement Academy and holds a law enforcement commission signed by the Regional Forester. District Level IV officers generally perform other duties as well as law enforcement.

Lifestyle - The characteristic way people live, indicated by consumption patterns, work, leisure, and other activities. (10)

Limit of Acceptable Change (LAC) - The amount of change to be allowed while maintaining the desired Wilderness conditions.

Linear programming - A mathematical method used to determine the cost-effective allocation of limited resources between competing demands when both the objective (e.g., profit or cost) and the restrictions on its attainment are expressible as a system of linear equalities or inequalities. (6)

Locatable minerals - Those hardrock minerals which can be obtained by filing a claim on Public Domain or National Forest System lands reserved from the Public Domain. In general, the locatable minerals are those hardrock minerals which are mined and processed for the recovery of metals, but may also include certain nonmetallic minerals and uncommon varieties of mineral materials. (6)

Logging residues - See *Slash*.

Long-term sustained yield capacity (LTSYC) - The highest uniform wood yield from lands being managed for timber production that may be sustained under a specified management intensity, consistent with multiple-use objectives. (1)

M

Management Area - An area with similar management objectives and a common management prescription. (1) (10)

Management concern - An issue, problem, or condition which influences the range of management practices identified by the Forest Service in the planning process. (1)

Management direction - A statement of multiple use and other goals and objectives, and the associated management prescriptions, and standards and guidelines for attainment. (1)

Management emphasis - That portion of a management scheme which receives the most stress or is of the greatest significance or importance. It may be the resources being produced, or it may be the way in which they are produced.

Management Indicator species - A species selected because it's welfare is presumed to be an indicator of the welfare of other species using the same habitat. A species whose condition can be used to assess the impacts of management actions on a particular area. (8)

Management Intensity - The management practices or combination of management practices and associated costs to obtain different levels of goods and services (1). In FORPLAN management prescriptions, a set of activities designed to accomplish a particular management emphasis (see also *Management Prescription*).

Management practice - A specific activity, measure, course of action, or treatment. (1)

Management prescription - The management practices and intensity selected and scheduled for application on a specific area to attain multiple use and other goals and objectives (1). In FORPLAN, the combination of a management emphasis and associated management intensities with a variety of timing choices for implementation. (2)

Management Requirement (MR) - Standards for resource protection, vegetation manipulation, silvicultural practices, even-aged management, riparian areas, wildlife population viability, soil and water protection and diversity, to be met in accomplishing National Forest System goals and objectives. (1)

Management Strategy - See *Management Prescription*.

Marginal timber component - Timber on which the income just equals or could just equal the costs of production under a given form of management. (3)

Market - The processes of exchanging a good or service for money or other goods or services according to a customary procedure. A market may occur in a specific place or throughout an area by individual transactions. (10)

Market area - The area from which a market draws or to which it distributes its goods or services and for which the same general price structure and price influences prevail. (10)

Market value - The unit price of an output normally exchanged in a market after at least one stage of production. Market value is expressed in terms of prices as evidenced by market transactions. (10)

Mass movement (mass wasting) - A general term for any of the variety of processes by which large masses of earth material are moved downslope by gravitational forces - either slowly or quickly. (6)

Mature timber - Trees that have attained full development, particularly height, and are in full seed production. When used for seral stage, it refers to trees which are 9 inches DBH to 20.9 inches DBH. When used for wildlife habitat, it refers to stands of conifer trees with a multi-layered canopy of at least two layers. The overstory trees will be dominated by conifers, 21 inches DBH or larger. (3)

Mature saw timber - Trees or stands of trees which generally have reached culmination mean annual increment. (10)

Maximum modification (MM) - See *Visual Quality Objective*.

Mean annual increment (MAI) (of growth) - The total volume of a tree or stand of trees up to a given age divided by that age. (2)

Memorandum of Understanding (MOU) - A written plan between the Forest Service and non-Federal parties for carrying out their separate activities in a coordinated and mutually beneficial manner. Each party directs its own activities and uses its own resources. A Memorandum of Understanding is not a fund obligating document. (10)

Mesotrophic - Habitats, particularly soil and water, of moderate nutrient capacity. (3)

Middleground - See *Distance Zone*.

Mineral entry - The filing of a mining claim upon public domain or related land to obtain the right to any minerals it may contain. (6)

Mineral entry withdrawal - The exclusion of mining locations and mineral development work on areas required for administrative sites by the Forest Service and other areas highly valued by the public. (6)

Mineral materials - Deposits such as sand, stone, gravel, and clay. (6)

Mineral soil - Weathered rock materials usually containing less than 20 percent organic matter. (6)

Minimum level management - FORPLAN term designating lands that will not be actively managed for timber or forage production. Often, these are lands that have high costs and low benefits associated with their management.

Minimum streamflows - A specified level of streamflow that must be maintained to benefit biological, physical, or other purposes.

Mining claim - A portion of public land which a claimant takes and holds in accordance with mining laws. (6)

Mitigation - Mitigation includes: (a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or elimination the impact over time by preservation and maintenance operations during the life of the action; and, (e) compensating for the impact by replacing or providing substitute resources or environments. (40 CFR Part 1508.20)

Mitigation measures - Actions to avoid, minimize, reduce, eliminate, or rectify adverse impacts of management practices.

Model - A representation of reality used to describe, analyze, or understand a particular concept. A "model" may be a relatively simple qualitative description of a system or organization, or a highly abstract set of mathematical equations. (6)

Modification (M) - See *Visual Quality Objective*.

Monitoring and evaluation - The periodic evaluation of Forest Plan management practices on a sample basis to determine how well objectives have been met.

Monoculture - The raising of a crop of trees consisting of only one species; such crops are usually even-aged. (16)

Mortality - In wildlife management, the loss in a population from any cause, including hunter kill, poaching, predation, accident, and disease. In forestry, trees in a stand that die of natural causes. (8)

Mountain pine beetle - A tiny black insect, ranging in size from 1/8 to 3/4 inch, that bores its way into a tree's cambium and cuts off its supply of nutrients, thus killing the tree.

Multiple use - The management of all the various renewable surface resources of the National Forest System so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some lands will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land and with consideration being given to the relative values of the various resources; and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output. (1)

Multiplier - A ratio of a measure of total change in income or employment to the direct income or employment change. The measure to total change may be direct plus indirect change (Type I Multipliers); or direct, indirect, and induced change (Type II Multipliers); or direct, indirect, and interactive increased induced demands based on population increase (Type III Multipliers). (10)

Municipal watershed - A watershed which provides water for human consumption and Forest Service management could have a significant effect on the quality of water at the intake point. Water is utilized by a community or any other water system that regularly serves: (1) at least 25 people at least 60 days in a year, or (2) at least 15 service connections. In addition to cities, campgrounds, residential developments, and restaurants may be included under regulations and standards applicable to municipal watersheds. (10)

N

National Direction - Statements of missions, goals, and objectives that guide Forest Service planning. (FSM 1905)

National Environmental Policy Act (NEPA) of 1969 - An Act, "to declare a National policy which will encourage productive and enjoyable harmony between humankind and the environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of humanity; to enrich the understanding of the ecological systems and natural resources important to the Nation; and to establish a Council on Environmental Quality." (The Principal Laws Relating to Forest Service Activities, Agriculture Handbook No. 453, USDA, Forest Service, 359 pp.)

National Forest Land and Resource Management Plan - A Plan which "... shall provide for multiple use and sustained yield of goods and services from the National Forest System in a way that maximizes long-term net public benefits in an environmentally sound manner." (1)

National Forest Management Act (NFMA) - A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring the preparation of Regional Guides and Forest Plans and the preparation of regulations to guide that development.

National Forest Systems (NFS) - All National Forest lands reserved or withdrawn from the public domain of the United States, all National Forest lands acquired through purchase, exchange, donation, or other means, the National Grasslands and land utilization projects administered under Title III of the Bankhead-Jones Farm Tenant Act (50 Stat. 525, 7 U.S.C. 1010-1012), and other lands, waters, or interests therein which are administered by the Forest Service or are designated for administration through the Forest Service as a part of the system. (16 U.S.C. 1608)

National Recreation Trails (NRT) - Trails designated by the Secretary of the Interior or the Secretary of Agriculture as part of the National system of trails authorized by the National Trails System Act. National Recreation Trails provide a variety of outdoor recreation uses. (6)

National Recreation Strategy - A conceptual framework aimed at finding creative and imaginative ways to take advantage of outdoor recreation opportunities by working with people to strengthen and round out the multiple-use management of the National Forests.

National Register of Historic Places - A register of cultural resources of national, state, or local significance maintained by the USDI, National Park Service. (10)

National Wilderness Preservation System - All lands covered by the Wilderness Act and subsequent Wilderness designations, regardless of the governmental department having jurisdiction.

Natural barrier - A natural feature that restricts livestock or wildlife movements, such as a dense stand of trees or a cliff.

Natural regeneration - Reforestation of a site by natural seeding from the surrounding trees. Natural regeneration may or may not be preceded by site preparation.

Net cash flow - The difference between the annual receipts of an alternative and costs required to implement that alternative.

Net public benefits - An expression used to signify the overall long-term value to the nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs), whether they can be quantitatively valued or not. Net public benefits are measured by both quantitative and qualitative criteria rather than a single measure or index. The maximization of net public benefits to be derived from management of units of the National Forest System is consistent with the principles of multiple use and sustained yield. (1)

Net receipts - Receipts minus costs.

Net returns to the Treasury, net cash flow - The difference between the total dollar receipts projected for an alternative and the total budget required to implement the alternative.

Nitrogen-fixing (Nitrogen fixation) - Conversion of free nitrogen by plants such as red alder into combined forms useful in nutrient cycles and other functions in the biosphere.

No Action Alternative (Alt. A) - This alternative is the "No Action" alternative required by the National Environmental Policy Act. It analyzes the effects of continuing management under direction established by the Olympic National Forest's Timber Management Plans, using updated timber resource inventories and yield tables. Often used interchangeably with "Current Direction" Alternative throughout the EIS.

No Change Alternative (Alt. NC) - This alternative would implement the Olympic National Forest Timber Management Plans, using the yield tables and timber resource inventories developed for the Plans. This alternative does not include all management requirements and would not meet the intent of the National Forest Management Act of 1976.

Nominal value - A monetary value relative to time that does not account for the effects of inflation.

Nonchargeable volume - All volume not included in the growth and yield projections for the selected management prescriptions used to arrive at the allowable sale quantity. (FSH 2409.13)

Noncommodity outputs - Resource outputs that are not normally bought and sold, or cannot be bought and sold, such as air quality or scenic beauty.

Nonconsumptive use - That use of a resource that does not reduce the supply. For example, nonconsumptive use of water includes hydroelectric power generation, boating, and swimming. (2)

Nondeclining flow (NDF) - Where the quantity of timber planned for sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade, and this planned sale and harvest for any decade is not greater than the long-term sustained yield capacity. (1)

Nonforest land - Lands that never have had or that are incapable of having 10 percent or more of the area occupied by forest trees; or lands previously having such cover and currently developed for nonforest use. (6)

Nongame species - Animal species which are not hunted, fished, or trapped.

Nonmarket value - The unit price of a nonmarket output normally not exchanged in a market at any stage before consumption; it is thus necessary to impute nonmarket value from other economic information. (10)

Nonmarket valued outputs - Assessed value of a goods or service which is not traded in the market place and has no market value. Because it is not bought and sold, some measure other than price must be used in establishing the value. (6)

Nonpoint source pollution - Pollution whose source is general rather than specific in location. It is widely used in reference to agricultural and related pollutants. For example, production of sediments by logging operations, agricultural pesticide applications, or automobile exhaust pollution. (6)

Nonpriced outputs - Nonpriced outputs are those for which there is no available market transaction evidence and no reasonable basis for estimating a dollar value. Subjective nondollar values are given to nonpriced outputs.

No surface occupancy - A clause used in mineral leases to prevent activities in sensitive areas. Sometimes results in closure of an area and sometimes has little impact if directional drilling can tap resources underlying restricted area.

Noxious weeds - Undesirable plant species that are unwholesome to the range or to animals. (6)

O

Objective - A concise, time-specific statement of measurable planned results that respond to pre-established goals. An objective forms the basis for further planning to define the precise steps to be taken and the resources to be used in achieving identified goals. (1)

Off-road vehicle (ORV) - Any motorized vehicle designed or capable of cross-county travel or travel on trails or low-standard roads (e.g., motorbikes, ATVs, 4-wheel drive vehicles, snowmobiles). (2)

Old-growth deficit - A forest without the excess volume of mature/overmature old-growth trees that could be used to offset reductions in programmed harvest volume resulting from allocation changes.

Old-growth habitat - Habitat for certain wildlife that is characterized by overmature coniferous forest stands with large snags and decaying logs.

Old-growth stand (old-growth) (OG) - Any stand of trees 10 acres or greater generally containing the following characteristics: 1) contain mature and overmature trees in the overstory and are well into the mature growth stage; 2) will usually contain a multilayered canopy and trees of several age classes; 3) standing dead trees and down material are present; and 4) evidences of man's activities may be present, but do not significantly alter the other characteristics and would be a subordinate factor in a description of such a stand. See the Regional Guide. (2)

Oligotrophic - Lakes characterized by a low accumulation of dissolved nutrient salts, supporting only sparse plant and animal life, and having a high oxygen content, owing to the low organic content. (4)

Open to entry - With respect to minerals management, lands available for mineral exploration and development under the mining laws.

Operational costs - Those costs associated with administering and maintaining National Forest facilities and resource programs.

Operational Plan - A document approved by the Forest Supervisor which specifies at the project level, implementation of the management direction established in the Forest Plan. (6)

Opportunity - A proposal that is considered in developing alternative activities, projects or programs where an option exists to invest profitably to improve or maintain a present condition.

Opportunity cost - The net value that is foregone when a given resource is employed in something other than its most efficient alternative use.

Optimal cover - Habitat for deer and elk which has tree overstory and understory, shrub and herb-aceous layers; the overstory canopy generally exceeds 70% crown closure, and dominant trees generally exceed 21" DBH, which provide snow intercept, thermal cover, and maintenance forage.

Output - A good, service, or on-site use that is produced from forest and rangeland resources. See FSH 1309.11 for forest and rangeland outputs codes and units measure. Examples: X06-Softwood Sawtimber Production MBF; X80-Increased Water Yield - Acre Feet; W01-Primitive Recreation Use RVD's. (FSM 1905)

Output, Market - A good, service, or on-site use that can be purchased at a price. (FSM 1905)

Output, Nonmarket - A good, service, or on-site use not normally exchanged in a market. (FSM 1905)

Overbid - To bid more than the appraised value. (4)

Overmature timber - The stage at which a tree declines in vigor and soundness. For example, a stage past the period of rapid height growth. (2)

Overstory - That portion of the trees, in a Forest or stand with more than one crown canopy, that forms the uppermost canopy. (3)

Overuse (overutilization) - Utilizing an excessive amount of the current year's growth which, if continued, will result in overgrazing and range deterioration.

Overwood removal - A harvest method that removes the overstory of a two-story stand and leaves the smaller understory for further treatment (thinning or harvesting).

P

Partial cut - Covers a variety of silvicultural practices where a portion of the stand is removed and a portion is left.

Partial retention (PR) - See *Visual Quality Objective*.

Particulates - Small particles suspended in the air and generally considered pollutants. (See *Total Suspended Particulates*.) (5)

Perennial stream - A stream that flows year round.

Permittee - Any person or business formally allowed to graze livestock on the land of another person or business (e.g.; on state or federal land). (3)

Personal use - Normally used to describe the type of permit issued for removal of wood products (firewood, posts, poles, and Christmas trees) from National Forest land when the product is for home use and not to be resold for profit.

Persons-at-one-time (PAOT) - A recreation capacity measurement term indicating the number of people who can use a facility or area at one time. (2)

Pests - Any animal or plant that, during some portion of its life cycle, inhibits the establishment or growth of some other species of plant or animal favored by man.

Pesticide - A substance intended for controlling insects, rodents, weeds, and other forms of plant or animal life that are considered to be pests. (16)

Phenology - The science dealing with the influence of climate on the recurrence of such annual phenomena of animal and plant life as bird migrations, budding, etc. (4)

Physiographic province - A Region having a particular pattern of relief features or land forms that differs significantly from that of adjacent Regions. (6)

Planned Ignition - A fire started deliberately, and controlled to accomplish a resource management objective.

Planning area - The area of the National Forest System covered by a Regional guide or forest plan. (1)

Planning criteria - Criteria prepared to guide the planning process. Criteria applied to collection and use of inventory data and information, analysis of the management situation, and the design, formulation, and evaluation of alternatives. (1)

Planning horizon - The overall time period considered in the planning process. It spans all activities covered in the analysis or plan and all future conditions and effects of proposed actions which would influence the planning decisions (1). In this FEIS and Forest Plan, the planning horizon is considered to be 15 decades.

Planning period - One decade. The time interval within the planning horizon that is used to show incremental changes in yields, costs, effects, and benefits. (1)

Planning records - The body of information documenting the decisions and activities which result from the process of developing a Forest Plan, revision, or significant amendment.

Plan of Operations - A document required from any person proposing to conduct mineral-related activities which utilize earth moving equipment and which will cause disturbance to surface resources or involve the cutting of trees. (36 CFR 228.4)

Plant associations - Abstract units of the potential vegetation which are characterized by the same overstory and understory dominants.

Plant community - A vegetative complex unique in its combination of plants; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site such as soils, temperature, elevation, solar radiation, slope, aspect, and rainfall; as used in this publication: plant associations where composition or structure provide significantly different wildlife habitat characteristics (e.g., herbaceous wetland, conifer/hardwood forest, high-temperate coniferous forest). (16)

Pole/sapling - A Forest successional stage in which trees between five and nine inches in diameter are the dominant vegetation. (See also *Size Class*.)

Pole timber - Trees of at least five inches in diameter at breast height, but smaller than the minimum utilization standard for sawtimber. (See also *Size Class*.)

Policy - A guiding principle upon which is based a specific decision or set of decisions. (FSM 1905)

Potential yield - (*This term is in reference to the 1979 Timber Resource Plan only.*) Optimum sustained yield of timber harvest volume attainable with intensive forestry on available commercial forest land (forest lands able to produce 20 cubic feet of timber per acre per year or more) while considering the interrelationship with other forest resources and uses. Intensive forestry includes planting only with genetic stock, precommercial thinning, commercial thinning and release. Programmable net salvage volume and volume from marginally economical lands are also included (in reference to 155.2 MMBF per year in the 1979 TM Plan).

Practices - Those management activities that are proposed or expected to occur.

Precommercial thinning (PCT) - The practice of removing some of the trees less than marketable size from a stand so that the remaining trees will grow faster. (2)

Prehistoric site - An area which contains important evidence and remains of the life and activities of early societies which did not record their history.

Preparatory cut - The removal of trees near the end of a rotation, which permanently opens the canopy and enables the crowns of seed bearers to enlarge, to improve conditions for seed production and natural regeneration. Typically done in the shelterwood system. (3)

Prescribed fire - A wildland fire burning under specified conditions which will accomplish certain planned objectives. The fire may result from either planned or unplanned ignitions. Proposals for use of unplanned ignitions for this purpose must be approved by the Regional Forester. (2)

Prescription - A written direction for harvest activities and regeneration methods.

Present net value (PNV) - The difference between the discounted value (benefits) of all outputs to which monetary values or established market prices are assigned and the total discounted costs of managing the planning area. (1)

Preservation (P) - See *Visual Quality Objective*. (2)

Presuppression - Activities organized in advance of fire occurrence to ensure effective suppression action. (2)

Price - The unit value of an output expressed in dollars. (10)

Price elasticity - A measure of the sensitivity of the quantity of a good or service exchanged to changes in price. (10)

Priced outputs - Priced outputs are those that are or can be exchanged in the market place. The dollar values for these outputs fall into two categories: market or nonmarket (assigned values).

Price-quantity relationship - A schedule of prices that would prevail in a market for various quantities of the output exchanged. (10)

Price trend analysis - An analysis done to estimate how a particular FORPLAN solution would change if predicted price trends were increased or decreased.

Primary cavity excavator - Wildlife species that excavate cavities in snags (dead trees). (16)

Primary manufacture - The cutting of logs into rough green products (lumber, veneer, chips, shingles, or shakes) of various dimensions.

Proclaimed land - Lands reserved from the Public Domain for National Forest purposes by presidential proclamation.

Program - Sets of activities or projects with specific objectives, defined in terms of specific results and responsibilities for accomplishments. (10)

Program Budget - A plan that allocates annual funds, work force ceilings, and targets among agencies. (10)

Program Budget Level - A single, comprehensive integrated program responsive to the Chief's direction that specifies a level of production attainable from a given investment of dollars and other resources. Each budget level represents a complete, full, and independent package within the criteria and constraints identified. (10)

Programmatic Memorandum of Agreement - An agreement between the USDA Forest Service, Pacific Northwest Region, the Washington State Historic Preservation Office (SHPO), and the Advisory Council on Historic Preservation on the management of two types of cultural resource sites found on the Forest: Depression-era administrative structures and prehistoric lithic scatters.

Programmed harvest - The amount of timber on the Forest that is scheduled for harvesting. The programmed harvest is based on current demand, funding, and multiple-use considerations.

Project - An organized effort to achieve an objective identified by location, timing, activities, outputs, effects, and time period and responsibilities for executions. (10)

Project design - The process of developing specific information necessary to describe the location, timing, activities, outputs, effects, accountability, and control of a project.

Public Involvement - A Forest Service process designed to broaden the information base upon which agency decisions are made by (1) informing the public about Forest Service activities, plan, and decisions, and (2) encouraging public understanding about and participation in the planning processes which lead to final decisionmaking. (10)

Public Issue - A subject or question of widespread public interest relating to management of the National Forest System. (1)

Public participation - Meetings, conferences, seminars, workshops, tours, written comments, responses to survey questionnaires, and similar activities designed and held to obtain comments from the public about Forest Service planning. (2)

Public participation activities - Meetings, conferences, seminars, workshops, tours, written comments, survey questionnaires, and similar activities designed or held to obtain comments from the general public and specific publics.

Purchaser credit - Credit earned by the purchaser of a National Forest timber sale by construction of contract-specified roads. Earned purchaser credit may be used by the purchaser as payment for National Forest timber removed. (2)

R

Range management - The art and science of planning and directing range utilization to secure sustained maximum production of livestock, milk, and/or cut forage, consistent with other uses and conserving natural resources. (3)

Raptors - Predatory birds, such as falcons, hawks, eagles, and owls.

Rate of return - The financial yield per unit cost determined as the rate of interest at which total discounted benefits equal total discounted costs. (Internal rate of return is a similar measure appropriate to the benefits and costs that affect private firms or individuals.) (10)

Real dollar value - A monetary value that compensates for the effects of inflation. (1)

Rearing habitat - Aquatic environments that have chemical properties and physical and biological characteristics suitable for raising juvenile fish species.

Receipts - Those priced benefits for which money will actually be paid to the Forest Service: recreation, timber harvest, mineral leases and special use fees.

Receipt shares - The portion of receipts derived from Forest Service resource management that is distributed to State and county governments, such as the Forest Service 25-percent fund payments. (1)

Record of Decision (ROD) - A document separate from, but associated with, an Environmental Impact Statement which states the decision, identifies all alternatives, specifies which alternatives were environmentally preferable, and states whether all practicable means to avoid environmental harm from the alternative have been adopted, and if not, why not. (40 CFR 1505.2)

Recreation capacity - The number of people that can take advantage of the recreation opportunity at any one time without substantially diminishing the quality of the recreation experience or the biophysical resources. (2)

Recreation Information Management (RIM) - A computer-oriented system for the organization and management of information concerning recreation use, occupancy, and management of National Forest resources.

Recreation opportunity - The availability of choice for a user to participate in a preferred activity within a preferred setting, in order to realize desired, satisfying, recreational experiences.

Recreation Opportunity Spectrum (ROS) - A framework for stratifying and defining classes of outdoor recreation environments, activities, and experience opportunities. The settings, activities, and opportunities for obtaining experiences have been arranged along a continuum or spectrum divided into seven classes: Primitive, Semi-Primitive Non-Motorized, Semi-Primitive Motorized, Roaded Modified, Roaded Natural, Rural, Urban.

1 - Primitive - Area is characterized by an essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other users is minimal. The area is managed to be essentially free from evidence of human-induced restrictions and controls. Motorized use within the area is not permitted.

2 - Semi-Primitive Non-Motorized - Area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Interaction between users is low, but there is often evidence of other users. The area is managed in such a way that subtle, minimum on-site controls and restrictions may be present. Motorized recreation use is not permitted, but local roads used for other resource management activities may be present on a limited basis. Use of such roads is restricted to minimize impacts on recreational experience opportunities.

3 - Semi-Primitive Motorized - Area is characterized by a predominantly natural or natural-appearing environment of moderate to large size. Concentration of users is low, but there is often evidence of other users. The area is managed in such a way that minimum on-site controls and restrictions, use of local primitive or collector roads with predominantly natural surfaces, and trails suitable for motor bikes are permitted.

4 - Roaded Natural - Area is characterized by predominantly natural-appearing environments with moderate evidence of the sights and sounds of humans. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident, but harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.

5 - Roaded Modified - A subclass of the Roaded Natural ROS class. Involves areas that are characterized by predominantly natural-appearing environments with high evidence of the sights and sounds of humans. Such evidence may not harmonize with the natural environment. Interaction between users may be moderate to high, with evidence of other users prevalent. Resource modification and utilization practices are evident and may not harmonize with the natural environment. Conventional motorized use is allowed and incorporated into construction standards and design of facilities.

6 - Rural - Area is characterized by a natural environment that has been substantially modified by development of structures, vegetative manipulation, or pastoral agricultural development. Resource

modification and utilization practices may be used to enhance specific recreation activities and maintain vegetative cover and soil. Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high. A considerable number of facilities are designed for use by a large number of people. Facilities are often provided for special activities. Moderate user densities are present in areas adjacent to developed sites. Facilities for intensified motorized use and parking are available.

7 - Urban - Area is characterized by a substantially urbanized environment, although the background may have natural-appearing elements. Renewable resource modification and utilization practices are often used to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans are predominant on site. Large numbers of users can be expected both on site and in nearby areas. Facilities for highly intensified motor use and parking are available with forms of mass transit often available to carry people throughout the site.

Recreation Visitor Day (RVD) - A measure of recreation use, in which one RVD equals twelve visitor hours, which may be aggregated continuously, intermittently, or simultaneously by one or more persons. (2)

Recreational river - See *Wild and Scenic River*.

Reduced service management - Management of developed recreation facilities below optimum maintenance standards.

Reforestation - The natural or artificial restocking of an area with forest trees. (2)

Regeneration - The renewal of a tree crop, whether by natural or artificial means. Also, the young crop itself, which is commonly referred to as reproduction. (2)

Region - An area covered by a Regional guide. See FSM 1221.3 for organizational definitions. (10)

Regional Forester - The Forest Service official responsible for administering a single Region.

Regional Guide - The guide developed to meet the requirements of the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended. It guides all natural resource management activities, and establishes management standards and guidelines for the National Forest System lands within a given Region. It also disaggregates the assigned Regional RPA objectives to the Forests within that Region.

Regulations - Generally refers to the Code of Federal Regulations, Title 36, Chapter II, which covers management of the Forest Service. (2)

Rehabilitation - Action taken to restore site productivity, water quality, or other resource values over a period of time.

Release - Freeing trees from competition for light, water, and nutrients by removing or reducing the vegetation growth that is overtopping or closely surrounding them.

Removal cut (final cut) - The removal of the last seed bearers or shelter trees after regeneration is established under a shelterwood method. (6)

Renewable resources - Resources that are possible to use indefinitely, when the use rate does not exceed the ability to renew the supply.

Renewable Resources Assessment - An appraisal of the Nation's renewable resources that recognizes their vital importance and the necessity for long-term planning and associated program development. The Assessment meets the requirements of Section 3 of the Resources Planning Act and includes analyses of present and anticipated uses, demands, and supplies of the renewable resources; a description of Forest Service programs and responsibilities; and a discussion of policy considerations, laws, and regulations.

Research Natural Area (RNA) - An area set aside by a public or private agency specifically to preserve a representative sample of an ecological community, primarily for scientific and educational purposes. In U.S.D.A. Forest Service usage, Research Natural Areas are areas designated to ensure representative samples of as many of the major naturally-occurring plant communities as possible. (6)

Reserved lands - Lands which have been removed from the acreage base used to calculate timber yields. These lands often have a preservation or protection status. Wildernesses, Research Natural Areas, and National Recreation Areas are examples of reserved lands. These areas are designated as reserved by the authority of the Chief of the Forest Service, or a higher official (see *Proclaimed Land*). (2)

Resident fish - Fish that do not require extended migrations to complete their life cycles. (16)

Residue - The vegetative material left on the ground after timber cutting and/or accumulating there as a result of storm, fire, or other damage. It includes unused logs, uprooted stumps, broken or uprooted stems, branches, twigs, leaves, bark, and chips.

Residual stand - The trees remaining standing after some activity such as selection cutting. (2)

Resource - Anything which is beneficial or useful - be it animal, vegetable, mineral, a location, a labor force, a view, an experience, etc. Resources, in the context of land use planning, thus vary from such commodities as timber and minerals to such amenities as scenery, scenic view points, or recreation opportunities. (6)

Resource allocation - The action of apportioning the supply of a resource to specific uses or to particular persons or organizations. (6)

Resource Allocation Model (RAM) - A mathematical model using linear programming which will allocate land to different management prescriptions and schedule implementation of those prescriptions simultaneously. The purpose of the model is to find a schedule and allocation that meets the goals of the Forest and optimizes some objective function, such as "minimize costs."

Resource Management Plan - A Plan developed prior to the Forest Plan that outlined the activities and projects for a particular resource element independently of considerations for other resources. Such Plans will be superseded by the Forest Plan.

Resource Planning Act (RPA) - The Forest and Rangeland Renewable Resources Planning Act of 1974. Also refers to the National Assessment and Recommended Program developed to fulfill the requirements of the Act. (2)

Responsible line officer - The Forest Service employee who has the authority to select and/or carry out a specific planning action. (1)

Retention (R) - See *Visual Quality Objective*.

Returns to counties - The portion of receipts derived from Forest Service resource management that is distributed to State and county governments such as the Forest Service 25 percent fund payments.

Right-of-way (R/W) - An accurately located strip of land with defined width, point of beginning, and point of ending; the area within which the user has authority to conduct operations approved or granted by the landowner in an authorizing document, such as a permit, easement, lease, license, or Memorandum of Understanding. (6)

Riparian - Pertaining to areas of land directly influenced by water. Riparian areas usually have visible vegetative or physical characteristics reflecting this water influence. Stream sides, lake borders, or marshes are typical riparian areas. (3)

Riparian area - Geographically delineated areas, with distinctive resource values and characteristics, that are comprised of aquatic and riparian ecosystems.

Riparian ecosystem - A transition between the aquatic ecosystem, and the adjacent upland terrestrial ecosystem. Identified by soil characteristics and distinctive vegetation communities that require free or unbound water.

Road - A general term denoting a way for purposes of travel by vehicles greater than 40 inches in width.

1. *Forest Arterial Road*. Provides services to large land areas and usually connects with public highways or other forest arterial roads to form an integrated network of primary travel routes. The location and standard are often determined by a demand for maximum mobility and travel efficiency rather than specific resource management service. It is usually developed and operated for long-term land and resource management purposes and constant service. (10)
2. *Forest Collector Road*. Serves smaller land areas than a forest arterial road and is usually connected to a forest arterial or public highway. Collects traffic from forest local roads and/or terminal facilities. The location and standard are influenced by both long-term multiresource service needs as well as travel efficiency. May be operated for either constant or intermittent service, depending on land use and resource management objectives for the area served by the facility. (10)
3. *Forest Local Road*. Connects terminal facilities with forest collector or forest arterial roads or public highways. The location and standard are usually controlled by specific resource activity requirements rather than travel efficiency needs. (10)

Roadless area - Areas studied during the Roadless Area Review and Evaluation process (RARE II) which are roadless and at least 5,000 acres in size.

Roadless Area Review and Evaluation II (RARE II) - The national inventory of roadless and undeveloped areas within the National Forest and Grasslands. This refers to the second such assessment, which was documented in the Final Environmental Impact Statement of the Roadless Area Review and Evaluation, January 1979. (2)

Rotation - Planned number of years between the formation of a generation of trees and its final harvest at a specified stage of maturity. Appropriate for even-aged management only. (6)

Roundwood products - Logs, bolts, or other round sections cut from trees.

Runoff - That part of precipitation which travels over the soil surface to the nearest outlet or channel.

Run-of-the-river facility - A hydropower project utilizing a diversion dam without a reservoir. Has some minor ponding, but generation is controlled by the available flow of the river.

S

Salable minerals - Mineral deposits outside the scope of the General Mining Law because of widespread occurrence and "common" nature (disposal under the Materials Act of 1947, as amended).

Sale preparation costs - Costs associated with preparing a timber harvest on Forest Service lands for sale to the public; usually include all administrative costs for developing sale layout, writing an Environmental Assessment and selling the timber sale.

Sale schedule - The quantity of timber planned for sale by time period, from the area of suitable land covered by a Forest plan. The first period, usually a decade, of the selected sale schedule provides the allowable sale quantity. Future periods are shown to establish that long-term sustained yield will be achieved and maintained. (1) For planning purposes, the sale schedule and the allowable sale quantity are synonymous for all periods or decades over the planning horizon. (1)

Salmonids - Fish within the family Salmonidae; e.g., salmon and trout. (16)

Salvage cuttings - Intermediate cuttings made to remove trees that are dead or in imminent danger of being killed by injurious agents. (10)

Sanitation cuttings - Intermediate cuttings made to remove dead, damaged, or susceptible trees to prevent the spread of pests or pathogens. (10)

Sanitation-salvage treatment - See *Salvage Cutting*; *Sanitation Cutting*.

Sawtimber - Trees containing at least one 12-foot sawlog or two noncontiguous 8-foot logs, and meeting regional specifications for freedom from defect. Softwood trees must be at least 9 inches in diameter and hardwood trees 11 inches in diameter at breast height.

Scarified - Land in which the topsoil has been broken up or loosened in preparation for regenerating by direct seeding or natural seedfall. Also refers to ripping or loosening road surfaces to a specified depth for obliteration or "putting a road to bed." (3)

Scenario - An account or synopsis of a projected course of action or event. (20)

Scenic River Areas - See *Wild and Scenic River*.

Scheduled timber harvests - Volumes and acres programmed for harvest which are within the allowable sale quantity. This does not include salvage and sanitation harvesting.

Scoping process - A part of the National Environmental Policy Act (NEPA) process; early and open activities used to determine the scope and significance of the issues, and the range of actions, alternatives, and impacts to be considered in an Environmental Impact Statement. (40 CFR 1501.7)

Second growth - Forest growth that has become established following some interference, such as cutting, serious fire, or insect attack, with the previous Forest crop. (6)

Sediment - Earth material transported, suspended, or deposited by water. (6)

Sediment Yield Index - An estimate, derived from the Forest's sediment yield estimation model, of the total sediment (suspended load and bedload) that is transported by a stream. The estimates include sediment resulting from roading, logging, and broadcast burning activities.

Seed tree cutting - Removal in one cut of the mature timber from an area, except for a small number of seed bearers left singly or in small groups. (3)

Seedlings and saplings - Live trees less than five inches in diameter at breast height. (See also *Size Class*.) (3)

Selection cutting - The annual or periodic removal of trees (particularly mature trees), individually or in small groups, from an uneven-aged forest, to realize the yield and establish a new crop of irregular constitution. (3)

Sensitive species - Plant or animal species which are susceptible or vulnerable to activity impacts or habitat alterations. Those species that have appeared in the Federal Register as proposed for classification or are under consideration for official listing as endangered or threatened species; that are on an official State list; or that are recognized by the Regional Forester as needing special management to prevent placement on Federal or State lists. (2)

Sensitivity analysis - A determination of the effects of varying the level of one or more factors, while holding the other factors constant. (6) (10)

Sensitivity level - A measure of people's concern for the scenic quality of the National Forests. Three sensitivity levels are employed, each identifying a different level of user concern for the visual environment.

LEVEL 1 - Highest sensitivity

LEVEL 2 - Average sensitivity

LEVEL 3 - Lowest sensitivity (2)

Separate suitability components (SSC lands) - Those forested lands tentatively suitable for timber production that grow less than 20 cubic feet per acre per year of timber but have greater than ten percent occupancy (trees cover more than ten percent of the acre).

Sequential Upper and Lower Bounds - A FORPLAN term referring to the constraint that sets upper and lower limits by which harvest levels can increase or decrease from decade to decade. This constraint constitutes a departure from nondeclining flow and allows the harvest to rise or fall by decade according to the bounds that are set. (See *Constraint*.)

Seral - A biotic community which is a developmental, transitory stage in an ecologic succession. (6)

Shelterwood - The cutting method that describes the silvicultural system which provides a source of seed and/or protection for regeneration, and the old crop (the shelterwood) is removed in two or more successive shelterwood cuttings. The first cutting is ordinarily the seed cutting, though it may be preceded by a preparatory cutting, and the last entry is the final cutting. Any intervening cutting is termed removal cutting. An even-aged stand results. (3)

Shelton Cooperative Sustained Yield Unit (SCSYU) - An area of land that includes both National Forest and private (Simpson Timber Company) lands. This area is cooperatively managed for a sustained yield of timber. Also referred to as "The Unit," or CSYU.

Silvicultural examination - The process used to gather the detailed in-place field data needed to determine management opportunities and direction for the timber resource within a small subdivision of a Forest area, such as a stand.

Silviculture - The art and science of controlling the establishment, composition, and growth of forests. (2)

Single-tree selection - See *Individual (Single) Tree Selection*.

Site Development Plan - A document containing information, data and drawings essential to the reconstruction of existing facilities or development of future facilities on a given site within the National Forest.

Site Index - A numerical evaluation of the quality of land for plant productivity, (6) . . . based on the height of dominant trees in a stand at an arbitrarily chosen age. (3)

Site preparation - 1) An activity (such as prescribed burning, disking, and tilling) performed in advance of reforestation, to ensure adequate survival and growth of the future crop; or 2) manipulation of the vegetation or soil of an area prior to planting or seeding. The manipulation follows harvest, wildfire, or construction in order to encourage the survival and growth of favored species. Site preparation may include the application of herbicides; burning, or cutting living vegetation that competes with the favored species; tilling the soil; or burning of organic debris (usually logging slash).

Site productivity - Production capability of specific areas of land.

Size class - For the purposes of Forest planning, size class refers to a range of stem diameters used for classifying timber in the Forest Plan data base.

SEEDLING / SAPLING = less than five-inch diameter

POLE / SAPLING OR POLE TIMBER = five-inch to nine-inch diameter

SAWTIMBER = greater than nine-inch diameter

Skidding - A general term for moving logs by sliding; not on wheels; developed originally from "skidways" to move logs from stump to roadside, deck, skidway, or other landing.

Skyline logging - A system of cable yarding in which all or part of the weight of the logs is supported by a suspended cable.

Slash - The residue left on the ground after timber harvest, and/or accumulations that result from storm, fire, girdling or poisoning. It includes unutilized logs, uprooted stumps, broken or uprooted stems, the heavier branchwood, etc.

Small game - Birds and small mammals normally hunted or trapped as defined by State regulations. (2)

Small sawtimber - Trees (9.0-20.9 inches DBH) that will yield logs suitable in size and quality for the production of lumber. (3--Definition modified)

Smolt - The juvenile life stage of salmon or steelhead trout migrating to the ocean and undergoing physiological changes from a freshwater existence to a saltwater existence. (16)

Snag - A standing dead tree.

Socioeconomic - Pertaining to, or signifying the combination or interaction of social and economic factors. (2)

Softwoods - Coniferous trees, usually evergreen, having needles or scale-like leaves.

Soil - The portion of the earth's surface consisting of disintegrated rock and humus. (7)

Soil productivity - The capacity of a soil to produce a specific crop such as fiber or forage under defined levels of management. Productivity is generally dependent on available soil moisture and nutrients, and length of growing season.

Soil Resource Inventory (SRI) - See *Soil Surveys*.

Soil surveys - Systematic examinations of soils in the field and in laboratories; their description and classification; the mapping of kinds of soil; the interpretation according to their adaptability for various crops, grasses, and trees; their behavior under use or treatment for plant production or for other purposes; and their productivity under different management systems. (6)

Soil texture - The relative proportions of the various soil separates in a soil, described by the classes of soil texture. Twelve basic soil texture classes are recognized, such as "loam." The textural classes may be modified by the addition of suitable adjectives when coarse fragments are present in substantial amounts; for example, "stony loam."

Spawning habitat - Aquatic environments that provide adequate gravel, water quality properties and flow characteristics suitable for spawning and subsequent egg incubation.

Special Interest Areas - Areas managed to make recreation opportunities available for the understanding of the earth and its geological, historical, archeological, botanical, and memorial features. (6)

Special Management Areas (SMA) - Areas of unusual public interest or other significance, e.g.; wilderness, primitive areas, scenic areas, or archeological areas. SMAs do not require formal designation, however, Special Interest Areas do. (10)

Special Use Permit - A permit issued under established laws and regulations to an individual, organization, or company for occupancy or use of National Forest land for some special purpose.

Spotted Owl Habitat Area (SOHA) - A habitat area designated to support one pair of northern spotted owls. (2)

Spotted owl network - All lands contained in SOHAs and all suitable spotted owl habitat contained in management prescriptions which preclude timber harvest.

Stand (tree stand, timber stand) - An aggregation of trees or other vegetation occupying a specific area and sufficiently uniform in species composition, age arrangement, and condition as to be distinguishable from the forest or other vegetation or land cover on adjoining areas. (2)

Stand diversity - Any attribute that makes one timber stand biologically or physically different from other stands. This difference can be measured by, but not limited to: different age classes; species; densities; or non-tree floristic composition.

Stand examination surveys - Procedures to collect data on Forest stands.

Standard - A statement which describes a condition when a job is done properly. Standards show how well something should be done, rather than what should be done. (6)

Standards and Guidelines - Principles specifying conditions or levels of environmental quality to be achieved.

Statewide Comprehensive Outdoor Recreation Plan (SCORP) - The Statewide Comprehensive Outdoor Recreation Plan for the State of Washington.

Stocking - The degree of land occupancy by trees as measured by basal area or number of trees and compared to a stocking standard that is the basal area or number of trees required to fully use the growth potential of the land.

Stream blockage - Accumulation of soil, rock, and organic material deposited in a stream channel by landslides that prevent fish from moving upstream.

Stream buffer - Vegetation left along a stream channel to protect the channel or water from the effects of logging, road building, or other management activity. (See *Vegetation Leave Area*.)

Stream class - Classification of streams based on the present and foreseeable uses of the water, and the potential effects of on-site changes on downstream uses. Four classes are defined:

CLASS I - Perennial or intermittent streams that: provide a source of water for domestic use; are used by large numbers of fish for spawning, rearing or migration; and/or are major tributaries to other Class I streams.

CLASS II - Perennial or intermittent streams that: are used by moderate though significant numbers of fish for spawning, rearing or migration; and/or may be tributaries to Class I streams or other Class II streams.

CLASS III - All other perennial streams not meeting higher class criteria.

CLASS IV - All other intermittent streams not meeting higher class criteria. (10)

Streamflow - The flow of water, generally with its suspended load, down a well-defined water course. (6)

Streamside Management Unit (SMU) - An area of varying width adjacent to a stream where practices that might affect water quality, fish, and other aquatic resources are modified to meet water quality goals, for each class of stream. The width of this area will vary with the management goals for each class of stream, characteristics of the stream and surrounding terrain, and the type and extent of the planned activity.

Stream structure - The arrangement of logs, boulders, and meanders which modify the flow of water, thereby causing the formation of pools and gravel bars in streams. Generally, there is a direct relationship between complexity of structure and fish habitat. Complex structure is also an indication of watershed stability.

Structural habitat components - The configuration of elements, parts, or constituents of a habitat. (3--Definition modified)

Stumpage (stumpage value) - The value of timber as it stands uncut, in terms of an amount per unit of volume. (6)

Substantive comment - A comment that provides factual information, professional opinion, or informed judgment germane to the action being proposed. (10)

Successional stage - A stage or recognizable condition of a plant community that occurs during its development from bare ground to climax; for example, coniferous forests in the Blue Mountains progress through six recognized stages: grass-forb; shrub-seedling; pole-sapling timber; young timber; mature timber; old-growth timber. (2)

Suitability - The appropriateness of applying certain resource management practices to a particular area of land, as determined by an analysis of the economic and environmental consequences and the alternative uses foregone. A unit of land may be suitable for a variety of individual or combined management practices. (1) (2) (FSM 1905)

Suitable Forest land - Land to be managed for timber production on a regulated basis.

Supply - The amount of an output that producers are willing to provide at the specified price, time period, and condition of sale.

Supply Schedule (Curve) - A schedule of amounts of an output that producers are willing to provide at a range of prices, at a given point in time and condition of sale. (See *Price-Quantity Relationship*.)

Suppression - The process of extinguishing or confining fire. (2)

Suspended sediment - Any material carried in suspension by water, which will ultimately settle to the bottom. (16)

Sustained-yield of products and services - The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forest System without impairment of the productivity of the land. (1) (6)

System trail - A narrow travel way which is managed and maintained on a regular basis to specific trail standards.

T

Technology change - A change in the relationship between inputs and outputs in a production process resulting from the implementation of new technology, or a new application of existing technology. (10)

Tentatively suitable Forest land - Forest land that is producing or is capable of producing crops of industrial wood and: (a) has not been withdrawn by Congress, the Secretary, or the Chief; (b) existing technology and knowledge is available to ensure timber production without irreversible damage to soils productivity, or watershed conditions; (c) existing technology and knowledge, as reflected in current research and experience, provides reasonable assurance that it is possible to restock adequately within five years after final harvest; and (d) adequate information is available to project responses to timber management activities.

The Nature Conservancy (TNC) - A private organization whose primary function consists of the acquisition of land which The Nature Conservancy believes should be under management by a public agency. The land usually has some specific environmental or conservation value attached to it; such as land which fits one of the ecological niches identified for inclusion in the Research Natural Area program, or which has some unique values for wildlife management.

Theoretical capacity - The maximum annual amount of recreation use a developed site is designed to accommodate.

Thermal cover - Cover used by animals to ameliorate effects of weather.

Thinning - A felling made in an immature stand primarily to maintain or accelerate diameter increment and also to improve the average form of the remaining trees without permanently breaking the canopy. An intermediate cutting. (3)

Threatened species - Those plant or animal species likely to become endangered throughout all or a significant portion of their range within the foreseeable future. A plant or animal species identified by the Secretary of Interior as threatened in accordance with the 1973 Endangered Species Act. (See also *Endangered Species*.) (2)

Tiering - Refers to the coverage of general matters in broader environmental impact statements (such as National program or policy statements) with subsequent narrower statements or environmental analyses (such as Regional or Basin-wide program statements, or ultimately, site-specific statements) incorporating, by reference, the general discussions and concentrating solely on the issues specific to the statement subsequently prepared. (40 CFR 1508.28)

Timber classification - Forest land is classified under each of the land management alternatives according to how it relates to the management of the timber resource. The following are definitions of timber classifications used for this purpose.

1. *Nonforest* - Land that has never supported forests and land formerly forested where use for timber production is precluded by development or other uses.
2. *Forest* - Land at least 10-percent stocked (based on crown cover) by forest trees of any size, or formerly having had such tree cover and not currently developed for nonforest use.
3. *Suitable* - Commercial forest land identified as appropriate for timber production in the forest planning process.
4. *Unsuitable* - Forest land withdrawn from timber utilization by statute or administrative regulation (for example, wilderness) or identified as not appropriate for timber production in the forest planning process.

Timber harvest schedule - See *Sale Schedule*.

Timber Management - The management of the forest to enhance production of wood products for commercial use. (16)

Timber Management Resource Plan (TM Plan) - A functional resource plan which establishes a sale volume to be sold each year based upon an analysis of the most recent resource inventories. This plan is an integrated plan which considers implications to other resources on the Forest.

Timber production - The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use. For purposes of Forest planning, the term "timber production" does not include production of fuelwood or harvest of unsuitable lands. (1) (2)

Timber Sale Program Quantity - The volume of timber planned for sale during the first decade of the planning horizon. It includes the allowable sale quantity (chargeable volume) and any additional material (nonchargeable volume) planned for sale. Expressed as the average for the first decade.

Timber stand improvement (TSI) - Measures such as thinning, pruning, release cutting, prescribed fire, girdling, weeding, or poisoning of unwanted trees aimed at improving the growing condition of the remaining trees. (2)

Topography - The configuration of a surface including its relief, elevation, and the position of its natural and human-created features. (6)

Total suspended particulates (TSP) - Any finely divided material (solid or liquid) that is airborne with an aerodynamic diameter smaller than a few hundred micrometers.

Tractor logging - Any logging method which uses a tractor as the motive power for transporting logs from the stumps to a collecting point--whether by dragging or carrying the logs. (3)

Tradeoff - The combination of benefits and costs which are gained and lost in switching between alternative courses of action. Trade-offs include only those portions of benefits and costs which are not common to all alternative courses of action under consideration. (6)

Trailhead - An area at the beginning of a trail with facilities ranging from roadside parking to a parking lot with toilets.

Trail Management Objective - The Primary Management Objective or planned type (hiker, ORV, stock, etc.), difficulty level (easiest, more difficult, and most difficult) and level of use (low, moderate or heavy) a trail is designed and maintained to serve.

Transitory range - Land that is suitable for grazing use of a nonenduring nature over a period of time; often found in the openings created by timber harvesting activities. For example, on particularly disturbed lands, grass may cover the area for a period of time before being replaced by trees or shrubs not suitable for forage. (6)

Treasury deposit - Forest cash income, less payments to counties. Calculated by subtracting direct costs and payments to counties from total Forest receipts. These represent actual deposits from the Forest to the Treasury.

Turbidity - The degree of opaqueness, or cloudiness, produced in water by suspended particulate matter, either organic or inorganic. Measured by light filtration or transmission and expressed in Jackson Turbidity Units (JTUs) or Nephelometric Turbidity Units (NTUs).

U

Unavailable Forest land - Land that can grow productive forest crops (timber) but has been legislatively or administratively allocated to forest uses that preclude timber harvest.

Understory - The trees and other woody species growing under a more-or-less continuous cover of branches and foliage formed collectively by the upper portion of adjacent trees and other woody growth. (6)

Undeveloped area - Portion of the National Forest that is essentially unroaded.

Undeveloped recreation - A general term referring to recreation use outside developed recreation sites; this includes activities such as scenic driving, hiking, backpacking, hunting, fishing, snowmobiling, horse-back riding, cross-country skiing, and recreation in primitive environments. (2)

Uneven-aged management - The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection. (1)

Uneven-aged silviculture systems - The combination of actions that result in the creation of forests or stands of trees, in which trees of several or many ages grow together. Cutting methods that develop and maintain uneven-aged stands are individual tree and group selecting cutting methods:

INDIVIDUAL TREE SELECTION CUTTING - The removal of selected trees of all size classes on an individual basis.

GROUP SELECTION CUTTING - The removal of all trees in groups for regeneration purposes. The size of the group will be small enough in area that all subsequent regeneration will be influenced by the surrounding uncut stand. Cuts are generally .25 - 2.0 acres in size.

Unplanned ignition - A fire started at random by either natural or human causes, or a deliberate incendiary fire.

Unsuitable Forest Land - Forest land not managed for timber production because: (a) Congress, the Secretary of Agriculture, or the Chief of the Forest Service has withdrawn it; (b) it is not producing or capable of producing crops of industrial wood; (c) technology is not available to prevent irreversible damage to soils, productivity, or watershed conditions; (d) there is no reasonable assurance, based on existing technology and knowledge, that it is possible to restock lands within five years after final harvest, as reflected in current research and experience; (e) there is, at present, a lack of adequate information about responses to timber management activities; or (f) timber management is inconsistent with or not cost-efficient in meeting the management requirements and multiple-use objectives specified in the Forest Plan. (10)

Utility corridor - A strip of land, up to approximately 600 feet in width, designated for the transportation of people, energy, commodities, and communications by: railroad, state highway, electrical power transmission (66 KV and above), and/or oil, gas, and coal slurry pipelines 10 inches in diameter and larger; and telecommunication cable and electronic sites for interstate use. (1)

Utilization standards - Standards guiding the projection of timber yields and the use and removal of timber. The standards are described in terms of minimum diameter at breast height, minimum length, and percent soundness of the wood, as appropriate. (1)

V

Variety Classes - A particular level of visual variety or diversity of landscape character. Variety Classes are obtained by classifying the landscape into different degrees of variety based on the premise that all landscapes have some value, but those with the most variety or diversity have the greatest potential for high scenic value.

There are three variety classes which identify the scenic quality of the natural landscape:

CLASS A (DISTINCTIVE) - Areas with landforms, water features, vegetative patterns, or rock formations that create a landscape of unusual and outstanding visual quality.

CLASS B (COMMON) - Areas with landscape features that provide an average amount of variety and create a landscape that is common to the area.

CLASS C (MINIMAL) - Areas with little change in their landscape features and little scenic quality.

Vegetation leave area - Area of land in which vegetation is left undisturbed in order to provide shade and organic debris to streams, or to prevent the acceleration of natural erosion processes. No regulated timber harvest is planned in these areas.

Vegetative management - Activities designed primarily to promote the health of the crop forest cover for multiple-use purposes.

Vertical relief - A contour variation of the land surface perpendicular in relation to the surrounding land. (3) (4)

Viable population - A population which has adequate numbers and dispersion of reproductive individuals to ensure the continued existence of the species population on the planning area. (FSM 1905)

Viewshed - Portion of the Forest that is seen from a major travel route, or high use location.

Viewshed Schedule - A document identifying management direction for meeting the goal and desired future condition described for areas allocated to the Scenic A2 management prescription.

Visual Absorption Capacity (VAC) - The physical capability of the land to support management activities without significantly affecting its visual character. Rated as high, moderate, and low.

HIGH (H) - High visual capability to absorb change.

MODERATE (M) - Moderate visual capability to absorb change.

LOW (L) - Low visual capability to absorb change.

Visual Enhancement - A short-term management alternative which is done with the express purpose of increasing positive visual variety where little variety now exists. (2)

Visual Management System - A process for identifying the visual characteristics of National Forest landscapes for the purpose of planning and analyzing ways to maintain or upgrade an area's scenic values and design resource management activities in order to minimize their visual effects as viewed from public use areas.

Visual Prescription - Management guidelines aimed at meeting Visual Quality Objectives. Visual prescriptions are identified by two major factors: Visual Quality Objective and Distance Zone.

Visually Sensitive Area - A viewshed seen from Visual Sensitivity Level One or Two--travel routes, use areas, or water bodies.

Visual quality objective (VQO) - Categories of acceptable landscape alteration measured in degrees of deviation from the natural-appearing landscape.

PRESERVATION (P) - Provides for ecological changes only.

RETENTION (R) - Management activities should not be evident but remain visually subordinate to the characteristic landscape.

MODIFICATION (M) - Management activities may dominate the characteristic landscape but must, at the same time, follow naturally established form, line, color, and texture. It should appear as a natural occurrence when viewed in foreground or middleground.

MAXIMUM MODIFICATION (MM) - Management activities may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.

Visual resource - The composite of basic terrain, geologic features, water features, vegetative patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors. (2)

Visual Sensitivity Level - A particular degree or measure of viewer interest in the scenic qualities of the landscape:

1. *LEVEL ONE* - High viewer interest.

2. *LEVEL TWO* - Moderate viewer interest.

3. *LEVEL THREE* - Low viewer interest. (17)

W

Water Influence Zone (WIZ) - An area comprised of aquatic, riparian, and adjacent terrestrial ecosystems. Includes flood plains, wetlands, and other lands adjacent to streams and lakes that can directly influence aquatic and riparian habitats. (10)

Water rights - Rights to divert and use water or to use it in place.

Water yield - The measured output of the Forest's streams. (6)

Watershed - The entire land area that contributes water to a drainage system or stream. (6)

Watershed Impact area - Areas within a watershed that are being affected by harvesting, road building, etc. Impact areas are limited to a percent of the total watershed area by the Standards and Guidelines in Chapter IV of the Forest Plan.

Westside Zone - The portion of the Olympic National Forest that includes the Soleduck and Quinault Ranger Districts and the Satsop Block area of the Hood Canal Ranger District.

Wetlands - Areas that are inundated by surface or ground water often enough to support, and usually do support plants and animals that require saturated or seasonally saturated soil conditions for growth and reproduction. (E.O. 11990)

Wild and Scenic River - Those rivers or sections of rivers designated as such by congressional action under the 1968 Wild and Scenic Rivers Act, as supplemented and amended, or those sections of rivers designated as wild, scenic, or recreational by an act of the legislature of the state or states through which they flow. Wild and scenic rivers may be classified and administered under one or more of the following categories:

1. **WILD RIVER AREAS** - Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted.
2. **SCENIC RIVER AREAS** - Those rivers or sections of rivers that are free of impoundments, with watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
3. **RECREATIONAL RIVER AREAS** - Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past. (2) (6)

Wilderness - Areas designated by congressional action under the 1964 Wilderness Act. Wilderness is defined as undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitation. Wildernesses are protected and managed to preserve their natural conditions, which generally appear to have been affected primarily by the forces of nature with the imprint of human activity substantially unnoticeable; have outstanding opportunities for solitude or a primitive and unconfined type of recreation; are of sufficient size to make practical their preservation, enjoyment, and use in an unimpaired condition; and may contain features of scientific, educational, scenic, or historical value as well as ecologic and geologic interest. Five Wildernesses were designated as a result of the Washington Wilderness Act of 1984. (2)

Wilderness Implementation Schedule - A document providing management direction aimed at meeting the goal and desired future condition for areas allocated to the Wilderness B1 management prescription.

Wilderness Resource Spectrum (WRS) - A framework for stratifying and defining classes of Wilderness environment, activities, and experience opportunities. The settings, activities, and opportunities for obtaining experiences have been arranged along a continuum or spectrum divided into the following classes:

CLASS I (LEAST PRISTINE)

An area that is characterized by a predominantly unmodified natural environment. The area generally receives high to very high use and day use may be a significant portion of the visitation. Evidence of other users within the area is high and campsites may be present. Fire rings at campsites may be present where campfires are permitted. System trails are present and their difficulty level generally ranges from Easiest to More Difficult. Stock users may stay overnight. Visitors will generally not experience a high level of solitude, risk, or challenge. Rustic signs and structures may be present. There will be a high frequency of contact with management personnel. This is a semi-primitive and the least pristine WRS class.

CLASS II

An area that is characterized by an unmodified natural environment. The area generally receives moderate to high use and day use may be a minor portion of the visitation. Evidence of other users within the area is moderate and campsites may be present. Fire rings at campsites may be present where campfires are permitted. System trails are present and their difficulty level generally ranges from More Difficult to Most Difficult. Stock users infrequently stay overnight. Visitors will generally have a moderate level of solitude, risk, and challenge. Rustic signs and structures may be present. There will be a moderate frequency of contact with management personnel. This is a semi-primitive WRS class.

CLASS III

An area that is characterized by an unmodified natural environment. The area generally receives low to moderate use and day use may be a minor portion of the visitation. Evidence of other users within the area is low to moderate and campsites without fire rings exist but are not noticeable from other campsites. System trails are not present. Stock users infrequently stay overnight. Visitors will generally have a high level of solitude, risk, and challenge. There are no signs or structures. There will be a low frequency of contact with management personnel. This is a primitive WRS class.

CLASS IV (MOST PRISTINE)

An area that is characterized by an unmodified natural environment. The area generally receives very low to low use and there is generally no day use. Evidence of other users within the area is very low and campsites and fire rings do not exist. System trails are not present. Stock users do not visit this area. Visitors will have a high level of solitude, risk, and challenge. There are no signs or structures. There will be a very low frequency of contact with management personnel. This is the most pristine WRS class.

Wildfire - Any wildland fire that is not a prescribed fire (see also *Prescribed Fire*). (2)

Wildlife and Fish User Day (WFUD) - Twelve visitor hours which may be aggregated continuously, intermittently, or simultaneously by one or more persons.

Windthrow - See *Blowdown*.

Withdrawal - A legislative or administrative order removing specific land areas from availability for certain uses.

Wood fiber production - The growing, tending, harvesting, and regeneration of harvestable trees.

Woody material - Organic materials necessary for stream channel stability and maintenance of watershed condition. It includes large logs and root wads.

Working circle (WC) - The primary unit of forest management, with well-defined boundaries, usually based on topography, large enough to furnish a sustained yield of forest products sufficient to support dependent communities or industries. (6)

Working group - A term used for planning purposes to identify and group the major commercial tree species harvested from the Forest. These classifications are based on the vegetative potential of a site and not necessarily the actual vegetative occupancy of the site. Working groups are further stratified by productivity potential.

X, Y, Z

Xeric - A dry soil moisture regime. Some moisture is present but does not occur at optimum levels for plant growth. Irrigation or summer fallow is often necessary for crop production. (3)

Yarding - Hauling timber from the stump to a collection point. (2)

Yield tables - Tables that estimate the level of outputs that would result from implementing a particular activity. Usually referred to in conjunction with FORPLAN input or output. Yield tables can be developed for timber volumes, range production, soil and water outputs, and other resources.

Zone of Influence - The geographic area whose social, economic and/or environmental condition is significantly affected by changes in Forest resource production or management.

Appendix A

Project Schedules



Olympic National Forest

APPENDIX A

PROJECT SCHEDULES

This appendix includes the schedule of projects and activities needed to achieve the outputs contained in Table IV-1 of Chapter IV, including the timber sale activity schedule.

The project schedules displayed here have been developed to facilitate transition in management from current direction to direction described in Chapter IV of this Forest Plan. This requires a "phase in" period for many programs. Also, outputs displayed elsewhere in this Plan, and in the FEIS, are average annual outputs. These schedules are specific to individual years within the first decade and fluctuate up or down from the average annual figures. However, they do approximate the decade totals.

The project schedules sometimes were developed from existing action plans and inventories, as well as activities developed specifically for this Plan. In some cases, the project list calls for new inventories or resource management schedules which will result in new projects and priorities. This will require periodic updating of the schedules displayed in this appendix. It is also expected that these schedules will need to be updated or adjusted annually to reflect results of the budgeting process and new action plans.

TIMBER SALE PROGRAM SCHEDULE

The timber sale schedule has been developed using the concept of Integrated Resource Analysis Areas (IRAAs). 164 IRAAs have been delineated on the Forest based largely on watershed boundaries. These areas are considerably smaller geographic areas than can be reasonably analyzed within the FORPLAN model. The timber outputs for the 21 major drainages defined in the FORPLAN solution have been disaggregated to the IRAAs based on acres of suitable land within species/productivity groups and management areas within each IRAA. Scheduling and volume goals are therefore directly tied to the FORPLAN model while considering more site specific issues, concerns, and opportunities (ICOs) for each IRAA.

Individual timber sale project decisions will be derived from the NEPA analyses completed during Plan implementation. The Integrated Resource Analysis will be used for scoping of ICOs and providing a framework upon which to base project level environmental analyses as documented in an environmental assessments (EA). This process ties the Forest Plan to the project decision in a meaningful way which does not assume a higher level of site specific analysis in the Forest Plan than actually exists.

A map of IRAAs has been included with the alternative maps. This map has been printed on transparent paper for overlay with the Forest Plan map, Alternative C-Preferred. The management areas within each IRAA can be determined by the map overlay. Each IRAA has been numbered on the map allowing location of the sale area IRAAs specified in this timber sale program schedule.

TIMBER SALE PROGRAM SCHEDULE BY FISCAL YEAR 1991 - 2000

Sale Area - IRAA Name/Number	Harvest Acre Goal		Harvest Volume Goal (MMBF)	
	CC	CT	CC	CT
YEAR SELL - 1991				
Hood Canal Ranger District (Non-SCYU)				
Fulton (05)	78		3.5	
Mt. Rose (18)	32		1.5	
Big (17)	64		4.3	
Lilliwaup (16)	8		1.5	
TOTAL	182		9.8	
Hood Canal (CSYU)				
Harris (37)	45		2.0	
Grisdale (44)	43		2.0	
Middle Skok (27)	147		5.0	
Govey (40)		250		2.0
TOTAL	235	250	9.0	2.0
Quilcene Ranger District				
Rocky Brook (65)	230		6.0	
Spencer (64)	150	75	4.0	1.0
Snow Creek (53)	150		2.0	
TOTAL	530	75	12.0	1.0
Quinault Ranger District				
Upper Matheny (76)	180		10.0	
East Fork (88)	110		6.0	
Queets (70)	145	45	8.0	.4
Cougar Mtn. (98)	70	80	4.0	.6
Chester (Worch) (89)	70		4.0	
Rainbow (St Rd) (96)	40		2.0	
Sams Rvr (N.Thin) (72)		40		.3
Stevens/Phillips (S. Thinning) (95/93)		400		3.0
Various Small Salvage Sales	20		1.0	
TOTAL	635	565	35.0	4.3
Soleduck Ranger District				
Kugel Creek (128)	50		2.5	
Middle Soleduck (123)	178		6.0	
Pistol Creek (139)	80		3.0	
West Sitkum (153)	70		2.4	
East Twin (113)	70		2.3	
Tom Creek (137)	70		3.5	
E. Soleduck (120)	85		2.0	
E. N. Fk Calawah (130)	72		5.7	
Various Small Salvage Sales	100		3.0	

Sale Area - IRAA Name/Number	CC	CT	CC	CT
TOTAL	775		30.4	
YEAR SELL - 1992				
Hood Canal Ranger District (Non-CSYU)				
Murhut (03)	216		8.6	
Washington (14)	50		0.9	
TOTAL	266		9.5	
Hood Canal Ranger District (CSYU)				
Neby (41)	178		8.8	
Quilcene Ranger District				
Townsend Creek (59)	140		5.0	
Marjack (67)	40	40	1.0	0.5
Jimmycomelately (49)	100		3.2	
Little Quilcene (58)	100		4.0	
TOTAL	380	40	13.2	0.5
Quinault Ranger District				
Park Boundary (73)	275		15.0	
Cook (99)	50	400	3.0	3.0
Rainbow (96)	130	200	7.0	1.5
Canoe (81)	90	100	5.0	.8
Matheny Prairie (78)	100		5.5	
Finley (77)	180		10.0	
Various Small Salvage Sales	20		1.0	
TOTAL	845	700	46.5	5.3
Soleduck Ranger District				
Elk Creek (154)	39		2.1	
Middle Creek (110)	57		2.1	
Beaver Creek (112)	77		3.5	
Little River (126)	90		3.1	
S. Branch Little River (135)	230		9.7	
Rainbow Creek (150)	97		4.6	
Bockman Creek (129)		250		1.5
East Soleduck (120)		133		0.8
Various Small Salvage Sales	66		3.0	
TOTAL	656	383	28.1	2.3
YEAR SELL - 1993				
Hood Canal Ranger District (Non-CSYU)				
Lilliwaup (16)	176		8.0	
Fulton (05)		200		1.5
TOTAL	176	200	8.0	1.5

Sale Area - IRAA Name/Number	CC	CT	CC	CT
Hood Canal Ranger District (CSYU)				
LeBar (26)	170		10.0	
Quilcene Ranger District				
Tunnel Creek (62)	125		5.0	
Upper Big Quilcene (61)	145		4.3	
Penny Creek (60)	125		2.0	
Sleepy Hollow (56)	80		3.0	
Rocky Brook (65)		100		0.5
TOTAL	475	100	14.3	0.5
Quinalt Ranger District				
Flatbottom (100)	180	300	10.0	2.4
S. Milbourn (86)	80		4.4	
Colonel Bob (82)	100	50	5.5	.4
Hook Branch (74)	180		10.0	
Elk Lake (84)	145		8.0	
Dilly (71)	145		8.0	
Various Small Salvage Sales	20		1.0	
TOTAL	850	350	46.9	2.8
Soleduck Ranger District				
Pistol Creek (139)	212		10.0	
Boundary Crk. (164)	138		4.6	
Hoh (162)	26		1.4	
Lost Creek (156)	137		7.2	
Upper Soleduck (134)	42		1.7	
Shuwah Creek (133)	30		1.2	
Middle Soleduck (123)		150		0.9
West Twin (109)		217		1.3
Various Small Salvage Sales	42		2.1	
TOTAL	627	367	28.2	2.2
YEAR SELL - 1994				
Hood Canal Ranger District (Non-CSYU)				
Grisdale (44)	45		2.2	
Schafer (36)	55		2.8	
E.Wynoochee (34)	35		1.8	
Canal (10)	100		2.4	
TOTAL	235		9.2	
Hood Canal Ranger District (CSYU)				
Vance (43)	103		6.8	
Rock (42)		300		2.4
TOTAL	103	300	6.8	2.4

Sale Area - IRAA Name/Number	CC	CT	CC	CT
Quilcene Ranger District				
Marjack (67)	75	100	2.7	1.3
Jimmycomelately (49)	100		3.2	
Cedar Flat (57)	140		3.0	
Caraco Creek (48)	110		2.0	
TOTAL	425	100	10.9	1.3
Quinault Ranger District				
Lost (92)	160		8.7	
Middle Matheny (79)	130		7.0	
Sweet (97)	130	250	7.0	2.0
Park Boundary (73)	180		10.0	
Boulder (90)		100		.8
West Shelter (85)	145		8.0	
W. Fk. Dam (91)	90		5.0	
Various Small Salvage Sales	20		1.0	
TOTAL	855	350	46.7	2.8
Soleduck Ranger District				
Lk Sutherland (119)	175		6.7	
Goodman Creek (132)	231		8.9	
Albion Creek (142)	98		5.3	
East Sitkum (148)	80		4.0	
Bockman Creek (129)		267		1.6
Upper Soleduck (134)		117		0.7
Various Small Salvage Sales	70		3.2	
TOTAL	654	384	28.1	2.3
YEAR SELL - 1995				
Hood Canal Ranger District (Non-CSYU)				
Four Stream (22)	168		9.5	
Hood Canal Ranger District (CSYU)				
Browns (30)	205		9.7	
Quilcene Ranger District				
Gold Creek (52)	90		3.0	
Rocky Brook (65)	200		5.5	
Upper Big Quil (61)	100		3.0	
Salmon Creek (50)	150		4.0	
TOTAL	540		15.5	

Sale Area - IRAA Name/Number	CC	CT	CC	CT
Quinault Ranger District				
Sams River (72)	200	100	11.0	.8
W. Boundary (75)	180	100	10.0	.8
Stevens (95)	100	150	5.5	1.2
Phillips (93)	70	150	4.0	1.2
Salmon (80)	200		11.0	
Various Small Salvage Sales	30		1.5	
TOTAL	780	500	43.0	4.0
Soleduck Ranger District				
East Sitkum (148)	200		9.0	
Middle Sitkum (151)	150		7.6	
Bear Creek (157)	123		6.7	
Eaton Creek (160)	39		2.1	
Middle Soleduck (123)		367		2.2
Various Small Salvage Sales	36		2.8	
TOTAL	548	367	28.2	2.2
YEAR SELL - 1996				
Hood Canal Ranger District (Non-CSYU)				
Hamma Hamma (11)	114		3.0	
Boulder (12)	59		3.1	
Cabin (7)	80		2.6	
TOTAL	253		8.7	
Hood Canal Ranger District (CSYU)				
Pine (28)	168		7.6	
Quilcene Ranger District				
Jimmycomelately (49)	70		2.5	
McDonald Creek (46)	50		1.0	
Lower Big Quil (63)	160		5.3	
Grey Wolf (51)	70		1.8	
Snow Creek (53)	160		4.0	
TOTAL	510		14.6	
Quinault Ranger District				
East Fork (88)	200		12.0	
Chester (89)	165	80	9.0	.6
Park Boundary (73)	180		10.0	
Grouse (94)	200	200	11.0	1.6
Sams River/W. Boundary (72)		200		1.6
Various Small Salvage Sales	40		2.0	
TOTAL	805	480	44.0	3.8

Sale Area - IRAA Name/Number	CC	CT	CC	CT
Soleduck Ranger District				
West Sitkum (153)	200		10.0	
Morganroth Crk (158)	96		5.3	
N. Fk. Sitkum (146)	166		9.0	
S. Branch Little River (135)	25		1.1	
S. Fk. Soleduck (136)		333		2.0
Various Small Salvage Sales	60		3.0	
TOTAL	547	333	28.4	2.0
YEAR SELL - 1997				
Hood Canal Ranger District (Non-CSYU)				
Washington (14)	124		5.4	
Mt. Rose (18)	132		4.5	
TOTAL	256		9.9	
Hood Canal Ranger District (CSYU)				
Cedar (35)	142		6.3	
Vance (43)	36		1.9	
TOTAL	178		8.2	
Quilcene Ranger District				
Tunnel Creek (62)	125		5.0	
Dosewallips I (66)	115		3.0	
Jimmycomelately (49)	85		3.0	
Little Quil (58)	75		3.0	
TOTAL	400		14.0	
Quinault Ranger District				
Finley (77)	70		4.0	
Rainbow (96)	145	100	8.0	.8
Canoe (81)	160		9.0	
Flatbottom (100)	80		4.0	
Dilly (71)	110		6.0	
Elk Lake (84)	180		10.0	
Salmon (80)	100	150	5.5	1.2
Stevens (95)		150		1.2
Various Small Salvage Sales	40		2.0	
TOTAL	885	400	48.5	3.2
Soleduck Ranger District				
Middle NF Calawah (131)	121		4.7	
Camp Creek (127)	211		8.1	
Cool Creek (143)	41		1.6	
Middle Sitkum (151)	210		10.6	
West Soleduck (125)		400		2.4
Various Small Salvage Sales	60		3.0	

Sale Area - IRAA Name/Number	CC	CT	CC	CT
TOTAL	643	400	28.0	2.4
Hood Canal Ranger District (Non-CSYU)				
Jefferson (15)	145		6.7	
Schafer (36)		400		2.8
TOTAL	145	400	6.7	2.8
Hood Canal Ranger District (CSYU)				
Rock (42)	199		9.3	
Quilcene Ranger District				
Caraco Creek (48)	135		4.0	
Green Hill (68)	50	110	1.5	1.0
Rixon (55)	80		2.0	
Snow Creek (53)	180		4.5	
TOTAL	445	110	12.0	1.0
Quinalt Ranger District				
West Shelter (85)	165		9.0	
Cook (99)		200		1.6
Sweet (97)	145	300	8.0	2.4
Park Boundary (73)	200		11.0	
Queets (70)	145	45	8.0	.4
Colonel Bob (82)	50		3.0	
Various Small Salvage Sales	40		2.0	
TOTAL	745	545	41.0	4.4
Soleduck Ranger District				
East Twin (113)	312		10.0	
Pysht (101)	104		4.0	
Middle Soleduck (123)	98		1.7	
Bockman Creek (129)	119		4.5	
East Sitkum (148)	108		5.4	
S. Fk. Soleduck (136)		333		2.0
Various Small Salvage Sales	60		2.8	
TOTAL	801	333	28.4	2.0
YEAR SELL - 1999				
Hood Canal Ranger District (Non-CSYU)				
Big (17)	87		3.9	
Dry Mountain (23)	40		1.6	
Canal (10)		200		1.5
Hamma Hamma (11)		200		2.5
TOTAL	127	400	5.5	4.0

Sale Area - IRAA Name/Number	CC	CT	CC	CT
Hood Canal Ranger District (CSYU)				
Canyon (39)	116		5.1	
E. Wynoochee (34)	120		4.9	
TOTAL	236		10.0	
Quilcene Ranger District				
Jimmycomelately (49)	80		2.2	
Dungeness (54)	30		1.0	
Dosewallips II (69)	70		1.7	
Salmon Creek (50)	150		4.0	
Canyon Creek (47)	120		3.0	
TOTAL	450		11.9	
Quinault Ranger District				
Upper Matheny (76)	200		11.0	
Middle Matheny (79)	165		9.0	
Phillips (93)	145	200	8.0	1.6
W. Fork Dam (91)	180		10.0	
Sweet (97)	90	150	5.0	1.2
Various Small Salvage Sales	40		2.0	
TOTAL	820	350	45.0	2.8
Soleduck Ranger District				
West Sitkum (153)	139		9.5	
Lower SF Calawah (152)	136		6.4	
Alcree Creek (147)	204		9.6	
Mid. NF Calawah (131)		333		2.0
Various Small Salvage Sales	56		2.9	
TOTAL	535	333	28.4	2.0
YEAR SELL - 2000				
Hood Canal Ranger District (Non-CSYU)				
Duckabush (04)	150	250	5.1	2.0
Watetickeh (08)		100		1.4
Washington (14)	30		1.4	
TOTAL	180	350	6.5	3.4
Hood Canal Ranger District (CSYU)				
W. Wynoochee (24)	107		5.0	
Scatter (33)	84		4.2	
TOTAL	191		9.2	

Sale Area - IRAA Name/Number	CC	CT	CC	CT
Quilcene Ranger District				
Jimmycomelately (49)	90		3.5	
Dosewallips I (66)	140		4.0	
Snow Creek (53)	190		5.0	
Caraco Creek (48)	100		2.5	
TOTAL	520		15.0	
Quinalt Ranger District				
Rainbow (96)	90	100	5.0	.8
Sams River (72)	200		11.0	
Chester (89)	180	100	10.0	.8
Boulder (90)	100	100	5.5	.8
Elk Lake (84)	90		5.0	
Park Boundary (73)	100		5.5	
Grouse (94)	60	100	3.0	.8
Various Small Salvage Sales	40		2.0	
TOTAL	860	400	47.0	3.2
Soleduck Ranger District				
S. Fk. Pysht (104)	70		2.5	
West Twin (109)	205		5.9	
Deep Creek (114)	71		2.1	
Indian Creek (124)	132		4.7	
West Soleduck (125)	101		3.3	
E NF Calawah (130)	140		4.0	
Pistol Creek (139)	80		2.9	
East Twin (113)		333		2.0
Various Small Salvage Sales	60		3.0	
TOTAL	859	333	28.4	2.0

DEVELOPED RECREATION SITES
(Unit of Measure - PAOT)

		Costs (thousands of dollars)		
Project Name/Type	Number of Units 1/	Feasibility Study	Preconstruction	Construction
FIRST 5 YEARS, 1991-1995				
Hood Canal Ranger District				
Big Creek Campground/Expansion	0/200	15.0	30.0	300.0
Coho Campground/Water System Reconstruction	0/0	7.0	14.0	135.0
Oxbow Campground/Construction	0/250	13.0	26.0	260.0
Quilcene Ranger District				
Elkhorn Campground/Reconstruction-Expansion	100/75	13.0	26.0	260.0
Falls View Campground/Reconstruction	150/0	10.0	20.0	200.0
Rainbow Campground/Reconstruction-Expansion	45/50	7.0	14.0	140.0
Quinault Ranger District				
Julas Campground/Construction	0/500	37.0	75.0	750.0
Gatton Creek Campground/Reconstruction-Expansion	75/45	6.0	12.0	120.0
Willaby Campground/Reconstruct Facilities	0/0	3.0	6.0	60.0
Soleduck Ranger District				
Klahowya Campground/Reconstruction	275/0	14.0	28.0	275.0
Kugel Creek Campground/Construction	0/100	8.0	15.0	150.0
Klahanie Campground/Construction	0/100	5.0	10.0	100.0
SECOND 5 YEARS, 1996-2000				
Hood Canal Ranger District				
High Steel Bridge Observation/Construction	0/80	8.0	15.0	150.0
Lena Lake Campground/Reconstruction	145/0	8.0	15.0	150.0
Wynoochee Falls Campground/Construction	0/120	6.0	12.0	120.0
Quilcene Ranger District				
Dungeness Forks Campground/Reconstruction-Expansion	50/85	10.0	20.0	200.0
N. Quilcene ORV Campground/Construction	0/100	8.0	15.0	150.0
N. Quilcene Horse Campground/Construction	0/75	6.0	12.0	120.0
Quinault Ranger District				
Falls Creek Campground/Reconstruction-Expansion	155/125	17.0	34.0	340.0
Lower E. Fork Humptulips Campground/Construction	0/60	5.0	9.0	90.0
Olallie Bike Campground/Construction	0/50	4.0	8.0	75.0
Soleduck Ranger District				
Hoh River Boat/Construction	0/50	4.0	8.0	75.0
S. Fork Soleduck Campground/Construction	0/225	17.0	34.0	335.0

		Costs (thousands of dollars)		
Project Name/Type	Number of Units ^{1/}	Feasibility Study	Preconstruction	Construction
ADDITIONAL DEVELOPED SITE PROJECTS (Potential projects but not expected to be completed during this planning period.)				
Hood Canal Ranger District				
Collins Campground/Reconstruction	80/0	5.0	10.0	100.0
Coho Campground/Addition of Facility	0/0	9.0	17.0	170.0
Chetwood Campground/Reconstruction	40/0	2.0	4.0	40.0
Spider Lake Picnic/Construction	0/50	3.0	5.0	50.0
Big Creek Campground/Additional Facility	0/0	6.0	12.0	120.0
Lena Creek Campground/Expansion	0/120	4.0	8.0	80.0
Chakchak Campground/Construction	0/200	15.0	30.0	300.0
Quilcene Ranger District				
Lower Dowewallips Campground/Construction	0/100	8.0	15.0	150.0
East Cross Campground/Reconstruction-Expansion	50/100	12.0	24.0	225.0
Seal Rock Campground & Picnic/Reconstruction	255/0	19.0	38.0	375.0
Mt. Walker Observation/Reconstruction-Expansion	50/50	8.0	15.0	150.0
Quinault Ranger District				
Sam's River Campground/Construction	0/100	8.0	15.0	150.0
Campbell Tree Grove Campground/Reconstruction	60/0	3.0	6.0	60.0
Willaby Campground/Reconstruction	150/0	8.0	15.0	150.0

^{1/} Number of existing PAOT to be reconstructed/Number of new PAOT to be constructed.

UNDEVELOPED RECREATION

			Costs (thousands of dollars)		
Project Name/Type	Unit of Measure	Number of Units	Feasibility Study	Preconstruction	Construction
FIRST 5 YEARS, 1991-1995					
Hood Canal Ranger District					
Undeveloped Recreation Implementation Schedule	Schedule	1	40.0		
Sanitation Facility/Reconstruction	Each	6	2.0	4.0	40.0
Jefferson Lake/Rehabilitation	PAOT	70	2.0	3.0	30.0
Quilcene Ranger District					
Dungeness Recreation Area Schedule	Schedule	1	10.0		
Snow Play Area/Construction	PAOT	200	3.0	5.0	50.0
Undeveloped Recreation Implementation Schedule	Schedule	1	20.0		
Quinault Ranger District					
Undeveloped Recreation Shelters/Construction Phase 1	Each	5	3.0	5.0	50.0
Undeveloped Recreation Implementation Schedule	Schedule	1	20.0		
Shelter/Reconstruction	Each	1	1.0	1.0	10.0
Soleduck Ranger District					
Undeveloped Recreation Implementation Schedule	Schedule	1	20.0		
Shelter/Construction	Each	4	2.0	4.0	40.0
Bridge Day Use	PAOT	10	1.0	2.0	15.0
SECOND 5 YEARS, 1996-2000					
Hood Canal Ranger District					
Snow Play Area/Construction	PAOT	200	3.0	5.0	50.0
Shelters/Reconstruction	Each	3	3.0	3.0	9.0
Undeveloped Recreation Rehabilitation	Each	10	5.0	10.0	100.0
Lena Creek Day Use/Rehabilitation	PAOT	25	2.0	3.0	25.0
Quilcene Ranger District					
Big Quilcene Viewpoint/Construction	PAOT	30	3.0	5.0	50.0
Quinault Ranger District					
Undeveloped Recreation Shelters/Construction Phase 2	Each	3	2.0	3.0	30.0
Undeveloped Recreation Development Schedule	Schedule	1	2.0	3.0	30.0

TRAILS

			Costs (thousands of dollars)		
Project Name/Type	Unit of Measure	Number of Units	Feasibility Study	Preconstruction	Construction
FIRST 5 YEARS, 1991-1995					
Hood Canal Ranger District					
Huckleberry Creek/Construction	Mile	5.0	6.0	12.0	75.0
Spider Lake/Reconstruction	Mile	2.1	2.0	3.0	17.0
Church Creek/Reconstruction	Mile	3.5	3.0	6.0	40.0
Skokomish ORV/Construction	Mile	20.0	20.0	45.0	300.0
Bear Gulch/Construction	Mile	3.0	4.0	7.0	45.0
Quilcene Ranger District					
Gold Creek/Reconstruction	Mile	8.7	10.0	20.0	130.0
Seal Rock/Reconstruction	Mile	0.2	2.0	3.0	20.0
Quilcene ORV/Construction	Mile	30.0	30.0	65.0	450.0
Falls View Canyon/Reconstruction	Mile	0.6	1.0	2.0	5.0
Little Quilcene/Reconstruction	Mile	4.1	3.0	5.0	33.0
Quinault Ranger District					
Gatton Creek Extension/Construction	Mile	4.0	5.0	9.0	60.0
Quinault Loop Extension/Construction	Mile	3.2	6.0	11.0	125.0
Colonel Bob-Pete's Creek/Reconstruction	Mile	9.7	5.0	12.0	79.0
Quinault Lake Loop/Beach Front Reconstruction	Mile	1.2	2.0	3.0	20.0
Julas/Construction	Mile	0.5	2.0	3.0	20.0
Soleduck Ranger District					
Mt. Muller/Construction	Mile	5.0	6.0	12.0	75.0
Spruce PAW RR/Construction	Mile	9.0	10.0	20.0	200.0
Littleton Loop/Construction	Mile	5.0	6.0	12.0	75.0
Kloshe-Nanich/Construction	Mile	3.0	4.0	7.0	45.0
Pine Mtn. Botanical Area/Construction	Mile	2.0	3.0	5.0	30.0
SECOND 5 YEARS, 1996-2000					
Hood Canal Ranger District					
Mt. Rose/Reconstruction	Mile	4.8	3.0	6.0	38.0
Dry Creek/Reconstruction	Mile	6.6	4.0	8.0	53.0
Jefferson Ridge/Reconstruction	Mile	5.5	5.0	10.0	63.0
Labar Horse Loop/Construction	Mile	17.0	19.0	38.0	255.0
Wynoochee Lake Shore/River Bridge Construction	Each	1	6.0	8.0	80.0
Quilcene Ranger District					
Mt. Walker/Reconstruction	Mile	2.0	2.0	3.0	16.0
Big Quilcene/Reconstruction	Mile	5.3	4.0	7.0	43.0
Deadfall Construction	Mile	3.5	4.0	8.0	53.0
East Zion/Construction	Mile	3.5	4.0	8.0	53.0
North Zion/Construction	Mile	4.5	5.0	10.0	68.0

			Costs (thousands of dollars)		
Project Name/Type	Unit of Measure	Number of Units	Feasibility Study	Preconstruction	Construction
Quinalt					
Willaby Creek/Reconstruction	Mile	1.7	1.0	2.0	14.0
Rain Forest/Reconstruction	Mile	0.6	1.0	2.0	10.0
Fitness/Construction	Mile	0.5	1.0	2.0	12.0
Quinalt Loop Bridges/Reconstruction	Each	3	4.0	8.0	36.0
Soleduck Ranger District					
N. Fork Calawah ORV/Construction	Mile	20.0	20.0	45.0	300.0
Snider Ridge/Construction	Mile	3.5	4.0	8.0	53.0
Bogachiel/Construction	Mile	2.0	3.0	5.0	30.0
Klahanie Eagle/Construction	Mile	2.0	2.0	3.0	16.0
Baldy Ridge/Construction	Mile	8.0	9.0	18.0	120.0
ADDITIONAL TRAIL PROJECTS (Potential projects but not expected to be completed during this planning period.)					
Hood Canal Ranger District					
Big Creek Loop/Reconstruction	Mile	1.1	1.0	2.0	8.0
Big Creek/Reconstruction	Mile	1.0	2.0	4.0	28.0
Wynoochee ORV/Construction	Mile	20.0	22.0	45.0	300.0
Nature Trail/Construction	Mile	2.5	3.0	6.0	38.0
Church Creek Shelter/Reconstruction	Mile	0.7	1.0	2.0	8.0
Quilcene Ranger District					
Bear Mountain/Reconstruction	Mile	2.0	3.0	5.0	30.0
Ned Hill/Reconstruction	Mile	1.0	1.0	2.0	8.0
Quilcene ORV/Construction	Mile	30.0	34.0	68.0	450.0
Deadfall/Construction	Mile	3.5	4.0	8.0	53.0
East Zion/Construction	Mile	3.5	4.0	8.0	53.0
Quinalt Ranger District					
Willaby Creek/Construction	Mile	5.0	6.0	12.0	75.0
E. Fork Humptulips/Construction	Mile	14.0	17.0	32.0	210.0
W. Fork Humptulips/Reconstruction	Mile	4.0	3.0	5.0	32.0
Fletcher Canyon/Reconstruction	Mile	2.4	2.0	3.0	20.0
Sam's River/Construction	Mile	8.1	10.0	19.0	128.0
Soleduck Ranger District					
Elwha/Construction	Mile	2.0	3.0	5.0	30.0
Snider-Jackson/Construction	Mile	9.0	10.0	20.0	135.0

TRAILHEADS
(Unit of Measure - PAOT)

		Costs (thousands of dollars)		
Project Name/Type	Number of Units 1/	Feasibility Study	Preconstruction	Construction
FIRST 5 YEARS, 1991-1995				
Hood Canal Ranger District				
Big Creek/Construction	60	3.0	3.0	22.0
Upper S. Fork Skokomish/Reconstruction	60	4.0	4.0	25.0
Upper Elk Lake/Construction	50	3.0	6.0	15.0
Bear Gulch/Construction	50	3.0	5.0	25.0
Spider Lake/Construction	50	2.0	5.0	22.0
Quilcene Ranger District				
Little Quilcene/Reconstruction	75	3.0	5.0	50.0
Gold Creek/Reconstruction	75	3.0	5.0	75.0
Tubal Cain/Reconstruction	175	5.0	7.0	95.0
Quinault Ranger District				
Gatton Creek/Construction Phase 2	75	3.0	10.0	100.0
Fletcher Canyon/Reconstruction	50	2.0	4.0	20.0
Soleduck Ranger District				
Rugged Ridge/Reconstruction	50	2.0	4.0	15.0
Mt. Muller/Construction	75	2.0	5.0	20.0
Littleton Loop/Construction	50	2.0	4.0	15.0
Kloshe-Nanich/Construction	50	2.0	5.0	15.0
Pine Mtn. Botanical Area/Construction	50	2.0	3.0	25.0
SECOND 5 YEARS, 1996-2000				
Hood Canal Ranger District				
Monarch Tree Grove/Construction	50	2.0	5.0	22.0
Mt. Rose/Construction	50	2.0	5.0	25.0
Quilcene Ranger District				
Lower Quilcene/Reconstruction	75	5.0	12.0	50.0
Big Quilcene/Reconstruction	75	3.0	5.0	50.0
Deadfall/Construction	75	5.0	7.0	75.0
Tunnel Creek (Quilcene Drainage)/Construction	80	3.0	5.0	50.0
Quinault Ranger District				
Quinault Botanical Area/Construction	155/125	17.0	34.0	340.0
Soleduck Ranger District				
N. Fork Calawah ORV/Construction	50	2.0	3.0	25.0
Bogachiel/Construction	50	2.0	3.0	20.0
Klahanie Eagle/Construction	50	2.0	3.0	25.0

		Costs (thousands of dollars)		
Project Name/Type	Number of Units 1/	Feasibility Study	Preconstruction	Construction
ADDITIONAL DEVELOPED SITE PROJECTS (Potential projects but not expected to be completed during this planning period.)				
Hood Canal Ranger District				
Putvin/Construction	100	3.0	6.0	30.0
Pine Lake/Construction	50	3.0	5.0	25.0
Quillcene Ranger District				
Tunnel Creek (Dosewallips Drainage)/Construction	80	3.0	5.0	50.0
Gray Wolf/Reconstruction	100	3.0	5.0	50.0
Dungeness/Reconstruction	250	5.0	7.0	50.0
Mt. Townsend/Construction	75	5.0	7.0	75.0
Quinault Ranger District				
W. Fork Humptulips/Construction	70	4.0	7.0	27.0
E. Fork Humptulips/Construction	50	3.0	5.0	25.0
Sam's River/Construction	80	3.0	5.0	50.0
Baldy Ridge/Construction	50	2.0	3.0	25.0

INTERPRETATION

			Costs (thousands of dollars)		
Project Name/Type	Unit of Measure	Number of Units	Feasibility Study	Preconstruction	Construction
FIRST 5 YEARS, 1991-1995					
All Districts					
District Interpretive Schedule	Schedule	4	20.0		
Hood Canal Ranger District					
Reception Office	Site	1	1.0	3.0	25.0
High Steel Bridge and Gorge	Project	1	1.0	3.0	25.0
Quinault Ranger District					
Quinault Sockeye Hatchery	Project	1	4.0	8.0	80.0
Quinault Loop	Project	1	2.0	6.0	20.0
Shades of Green Brochure	Project	1	1.0	2.0	10.0
Soleduck Ranger District					
Pine Mtn. Botanical Area	Project	1	2.0	11.0	25.0
SECOND 5 YEARS, 1996-2000					
Hood Canal Ranger District					
Resource Auto Tour	Mile	20	5.0	10.0	30.0
Coho Vista	Project	1	1.0	12.0	15.0
District Brochure	Project	1	1.0	6.0	10.0
Quilcene Ranger District					
Falls View	Project	1	5.0	8.0	50.0
Quinault Ranger District					
Campbell Tree Grove	Project	1	3.0	6.0	30.0
Reception Office	Project	1	1.0	3.0	25.0
W. Fork Humptulips Gorge	Project	1	3.0	6.0	25.0
Soleduck Ranger District					
Klahanie Eagle	Project	1	3.0	5.0	20.0
Reception Office	Site	1	1.0	3.0	25.0
ADDITIONAL INTERPRETIVE PROJECTS (Potential projects but not expected to be completed during this planning period.)					
Hood Canal Ranger District					
District Video	Project	1	3.0	4.0	36.0
Highway 101 Interpretive Station	Project	1	7.0	9.0	14.0
Denny Ahl	Project	1	8.0	10.0	94.0
Alaska Cedar Botanical Area	Project	1	2.0	6.0	30.0
Nature Trail	Project	3	4.0	8.0	45.0

WILDERNESS

			Costs (thousands of dollars)		
Project Name/Type	Unit of Measure	Number of Units	Feasibility Study	Preconstruction	Construction
FIRST 5 YEARS, 1991-1995					
Hood Canal Ranger District					
Mt. Skokomish Implementation Schedule	Schedule	1	10.0		
The Bros. Implementation Schedule	Schedule	1	10.0		
Wonder Mtn. Implementation Schedule	Schedule	1	10.0		
Quilcene Ranger District					
Buckhorn Implementation Schedule	Schedule	1	10.0		
Sensitive Plant Survey	Survey	1	60.0		
Mountain Goat Analysis	Analysis	1	100.0		
Quinault Ranger District					
Colonel Bob Implementation Schedule	Schedule	1	10.0		
Sensitive Plant Survey	Survey	1	20.0		
Search & Rescue Schedule	Schedule	1	5.0		
SECOND 5 YEARS, 1996-2000					
Hood Canal Ranger District					
Trail Brochure	Project	1	2.0	10.0	30.0
Sensitive Plant Survey	Survey	1	10.0		
Water Quality Analysis	Analysis	1	10.0		
Quilcene Ranger District					
Fire Management Analysis	Analysis	1	75.0		
Water Quality Analysis	Analysis	1	75.0		
Air Quality Analysis	Analysis	1	75.0		
Site Rehabilitation	Project	1	50.0		
Quinault Ranger District					
Water Quality Analysis	Analysis	1	10.0		
Air Quality Analysis	Analysis	1	10.0		
Site Rehabilitation	Project	1	8.0		

SCENERY
(Unit of Measure - Schedule)

Project Name/Type	Number of Units	Feasibility Study Costs (thousands of dollars)
FIRST 5 YEARS, 1991-1995		
Hood Canal Ranger District		
Scenic Byway	1	10.0
Viewshed Schedule	2	40.0
Vegetative Management Schedule	2	20.0
Quilcene Ranger District		
Viewshed Schedule	2	40.0
Vegetative Management Schedule	2	20.0
Quinault Ranger District		
Scenic Byway	2	20.0
Viewshed Schedule	2	40.0
Vegetative Management Schedule	2	20.0
Soleduck Ranger District		
Viewshed Schedule	2	40.0
Vegetative Management Schedule	1	10.0
SECOND 5 YEARS, 1996-2000		
Hood Canal Ranger District		
Viewshed Schedule	2	40.0
Vegetative Management Schedule	2	20.0
Quilcene Ranger District		
Viewshed Schedule	2	40.0
Vegetative Management Schedule	2	20.0
Quinault Ranger District		
Viewshed Schedule	2	40.0
Vegetative Management Schedule	2	20.0
Soleduck Ranger District		
Viewshed Schedule	1	20.0
Vegetative Management Schedule	1	10.0

WILD AND SCENIC RIVERS

Project Name/Type	Unit of Measure	Number of Units	Feasibility Study Costs (thousands of dollars)
FIRST 5 YEARS, 1991-1995			
Hood Canal Ranger District			
Duckabush River/Implementation Schedule	Schedule	1	30.0
Quilcene Ranger District			
Dungeness River/Implementation Schedule	Schedule	1	17.0
Graywolf River/Implementation Schedule	Schedule	1	30.0
Hood Canal & Quilcene Ranger Districts			
Wild & Scenic River/Boundary Designation	Project	3	25.0

CULTURAL RESOURCES

Project Type and Name	Ranger District	Unit of Measure	Number of Units	Costs (thousands of dollars)
INVENTORY				
FIRST 5 YEARS, 1991-1995				
Project Generated Surveys				
Timber	All	1,000 Acres	50.0	200.0
Recreation	All	Projects	45.0	25.0
Lands	All	1,000 Acres	23.0	69.0
Fish & Wildlife	All	Projects	287	5.0
Fish & Wildlife	All	1,000 Acres	1.1	10.0
Cultural Resources	All	Projects	10	2.0
Fire Management	All	Projects	10	2.0
Other	All	1,000 Acres	0.1	5.0
Non-Project/General Surveys				
Priority Areas	All	1,000 Acres	50.0	200.0
Overview Updates	All	Projects	1	10.0
SECOND 5 YEARS, 1996-2000				
Project Generated Surveys	All	Miscellaneous	All	383.0
Non-Project/General Surveys	All	Miscellaneous	All	250.0
Overview Updates	All	Projects	1	10.0
EVALUATIONS AND ASSESSMENTS				
FIRST 5 YEARS, 1991-1995				
Evaluations				
Louella Guard Station	Quilcene	Sites	1	2.0
Pitch Tree Site	Quilcene	Sites	1	4.0
Quilcene Ranger Station Compound	Quilcene	Sites	1	4.0
Jefferson Lake Culturally Modified Trees	Hood Canal	Sites	1	2.0
Trail Shelters	All	Sites	10	5.0
CCC Recreation/Other	All	Sites	1	3.0
Other	All	Sites	5	10.0
Data Recovery				
Unnamed	All	Sites	2	15.0
Nominations				
Interoorem	Hood Canal	Sites	1	2.0
Slab Camp Prehistoric	Quilcene	Sites	1	3.0
Louella Guard Station	Quilcene	Sites	1	5.0
CCC Administration	All	Sites	2	4.0
Others	All	Sites	2	5.0

Project Type and Name	Ranger District	Unit of Measure	Number of Units	Costs (thousands of dollars)
SECOND 5 YEARS, 1996-2000				
Evaluations				
Early Ranger Stations	All	Sites	25	10.0
Lookouts	All	Sites	50	10.0
Other	All	Sites	5	8.0
Data Recovery	All	Sites	2	15.0
Nominations	All	Sites	5	10.0
ADDITIONAL EVALUATIONS AND ASSESSMENTS (Potential projects, but not expected to be completed during this planning period.)				
Railroad Logging Thematic	All	Themes	1	20.0
Spruce Division Theme	All	Themes	1	8.0
PROTECTION AND ENHANCEMENT				
FIRST 5 YEARS, 1991-1995				
Interpretive Projects				
Hamma Hamma Guard Station, Phase II	Hood Canal	Project	1	35.0
Interrorem Guard Station	Hood Canal	Project	1	14.3
Falls Creek CCC Community Kitchen	Quinault	Project	1	9.1
Mt. Walker Observation Point	Quilcene	Project	1	93.0
Snider CCC Work Center	Soleduck	Project	1	36.0
Management Plans	All	Districts	5	35.0
Monitoring Properties	All	Sites	17	8.5
SECOND 5 YEARS, 1996-2000				
Interpretive Projects (Feasibility Only)				
Quilcene Museum Partnership	Quilcene	Project	1	8.0
Louella Guard Station (Interp.)	Quilcene	Project	1	7.5
Louella Guard Station (Rehab.)	Quilcene	Project	1	5.0
Slab Camp Prehistoric	Quilcene	Project	1	6.5
Ned Hill Lookout	Quilcene	Project	1	5.5
Management Plans	All	Districts	5	35.0
Monitoring Properties	All	Sites	25	16.0

Project Type and Name	Ranger District	Unit of Measure	Number of Units	Costs (thousands of dollars)
ADDITIONAL INTERPRETIVE PROJECTS (Potential projects for which additional information is needed and completion is not expected during this planning period.)				
Interpretive Projects (Feasibility Only)				
Kloshe-Nanich Northpoint Lookout (Phase II)	Soleduck	Project	1	5.0
Tubal Cain Mine	Quilcene	Project	1	3.0
Klahanie Fishing Site	Soleduck	Project	1	6.0
Phoenix Logging Railroad	Hood Canal	Project	1	4.0
Homestead	Soleduck	Project	1	2.0
Mulkey Shelter	Quinault	Project	1	2.0
Higley Peak Lookout	Quinault	Project	1	4.0
Norwood Barn	Quinault	Project	1	2.0

WILDLIFE

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
FISCAL YEAR 1991					
Hood Canal Ranger District					
Pond/Wetland/Meadow Inventory	0	0	0	1	15.0
Pond/Wetland/Meadow Habitat Improvement	15	0	0	1	45.0
Wynoochee Reservoir Rehabilitation	5	0	0	0	15.0
Riparian Rehabilitation	20	0	0	0	15.0
Big Game Management Plan	0	0	0	1	5.0
Big Game Habitat Improvement	100	0	0	0	9.0
Road Closure Habitat Improvement	100	0	0	0	5.0
Roadside Forage Improvement	10	0	0	0	18.0
Special Wildlife Sites Inventory	0	0	0	1	11.0
Raptor Nest Survey	0	0	0	1	13.0
Bat Roost/Nursery Boxes	0	5	0	0	5.0
Nesting Structure Maintenance	0	25	0	0	5.0
Wildlife Tree Inventory/Program	0	0	0	1	12.5
Wildlife Project Monitoring	0	0	0	1	6.0
Wildlife Project Maintenance	100	0	0	1	20.0
Wildlife Information & Education	0	0	0	1	5.0
DISTRICT TOTAL	350	30	0	9	204.5
Quilcene Ranger District					
Forage Seeding (Deer/Elk) - KV	90	0	0	0	15.0
Riparian Planting - KV	5	0	0	0	5.0
Wetland Enhancement Plant	10	0	0	0	10.0
Mountain Goat General Survey	0	0	0	1	8.0
Elk Herd Analysis	0	0	0	1	7.0
Deer Browse Project	25	0	0	0	5.0
DISTRICT TOTAL	130	0	0	2	50.0
Quinalt Ranger District					
Ruffed Grouse Habitat Enhancement	0	0	0	0	0.0
Wetland Enhancement	0	0	0	0	0.0
Road Management/Maintenance	0	0	0	0	0.0
Big Game Forage Seeding	0	0	0	0	0.0
Habitat Enhancement	0	0	0	0	0.0
Snag Creation	0	0	0	0	0.0
Nest Boxes/Maintenance	0	0	0	0	0.0
Nest Box Monitoring	0	0	0	0	0.0
Elk Winter Range Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	0	0.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
Soleduck Ranger District					
Aerial Seeding for Big Game - KV	150	0	0	0	38.5
National Forest Calawah Elk Meadows	10	0	0	0	50.0
Understory Forage Seeding - KV	20	0	0	0	6.0
West End Elk Study	0	0	0	0	50.0
Snag Inventory	0	0	0	0	10.5
Amphibian Survey	0	0	0	0	8.0
Wetland Development	3	0	0	0	18.0
Wildlife Tree Blasting - KV	0	150	0	0	20.0
Bird Boxes	0	50	0	0	5.0
Riparian Site Conversion	0	0	0	0	20.0
Basin Elk & Deer Management Plan	0	0	0	0	15.0
Pine Marten Survey	0	0	0	0	15.0
Cavity Excavators/PW Survey	0	0	0	0	15.0
Raptor Survey	0	0	0	0	10.0
Monitoring & Maintenance	0	0	0	0	3.0
Wildlife Tree Management Plan	0	0	0	0	5.0
DISTRICT TOTAL	183	200	0	0	289.0
FISCAL YEAR TOTAL	663	230	0	11	543.5
FISCAL YEAR 1992					
Hood Canal Ranger District					
Pond/Wetland/Meadow Inventory	0	0	0	1	15.0
Pond Wetland/Meadow Habitat Improvement	0	0	0	2	45.0
Wynoochee Reservoir Rehabilitation	5	0	0	0	15.0
Riparian Rehabilitation	20	0	0	0	15.0
Sub-Basin Big Game Management Plan	0	0	0	1	5.0
Nest Boxes at Denny Ahl Orchard	0	15	0	0	5.0
Big Game Habitat Improvement	100	0	0	0	9.0
Road Closure Habitat Improvement	100	0	0	0	5.0
Roadside Forage Improvement	10	0	0	0	18.0
Special Wildlife Sites Inventory	0	0	0	1	11.0
Raptor Nest Survey	0	0	0	1	13.0
Bat Roost/Nursery Boxes	0	5	0	0	5.0
Nesting Structure Maintenance	0	25	0	0	5.0
Wildlife Tree Inventory/Program	0	0	0	1	5.0
Wildlife Tree Habitat Improvement	150	0	0	0	25.0
Wildlife Project Monitoring	0	0	0	1	6.0
Wildlife Project Maintenance	100	0	0	1	20.0
Wildlife Information & Education	0	0	0	1	5.0
DISTRICT TOTAL	485	45	0	10	227.0
Quilcene Ranger District					
Forage Seeding - KV	10	0	0	0	3.0
Riparian Planting - KV	5	0	0	0	5.0
Wildlife Area Signing - KV	5	0	0	0	1.0
Mountain Goat General Survey	0	0	0	1	8.0
Browse Project - Monitor	0	0	0	1	2.0
Road Closure	0	1	0	0	3.0
DISTRICT TOTAL	20	1	0	2	22.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
Quinault Ranger District					
Ruffed Grouse Habitat Enhancement	0	0	0	0	0.0
Wetland Enhancement	0	0	0	5	0.0
Road Management/Maintenance	0	0	0	0	0.0
Big Game Forage Seeding	0	0	0	0	0.0
Habitat Enhancement	0	0	0	0	0.0
Snag Creation	0	0	0	0	0.0
Nest Boxes Maintenance	0	0	0	0	0.0
Nest Box Monitoring	0	0	0	0	0.0
Elk Winter Range Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	5	0.0
Soleduck Ranger District					
Aerial Seeding - KV	150	0	0	0	39.0
West End Elk Study	0	0	0	0	50.0
Snag Inventory	0	0	0	0	10.5
Wildlife Tree Blasting - KV	0	150	0	0	20.0
Riparian Site Conversion	0	0	0	0	20.0
Basin Elk & Deer Management Plan	0	0	0	0	15.0
Pine Marten Survey	0	0	0	0	15.0
Cavity Excavators/PW Survey	0	0	0	0	15.0
Monitoring & Maintenance	0	0	0	0	7.0
Fork's Burn Elk Meadow	10	0	0	0	50.0
Osprey Platforms	0	2	0	0	1.0
Grouse Inventory	0	0	0	0	10.0
Willow Plantings - KV	0	0	0	0	3.0
Road Closure Plan & Evaluation	0	0	0	0	5.0
Bonidu Plots Information & Education	0	0	0	0	3.0
DISTRICT TOTAL	160	152	0	0	263.5
FISCAL YEAR TOTAL	665	198	0	17	512.5
FISCAL YEAR 1993					
Hood Canal Ranger District					
Pond/Wetland/Meadow Inventory	0	0	0	1	15.0
Pond/Wetland/Meadow Habitat Improvement	0	0	0	1	45.0
Wynoochee Reservoir Rehabilitation	5	0	0	0	15.0
Riparian Rehabilitation	20	0	0	0	15.0
Sub-Basin Big Game Management	0	0	0	1	5.0
Big Game Habitat Improvement	100	0	0	0	9.0
Road Closure Habitat Improvement	100	0	0	0	5.0
Roadside Forage Improvement	10	0	0	0	18.0
Special Wildlife Sites Inventory	0	0	0	1	11.0
Raptor Nest Survey	0	0	0	1	13.0
Bat Roost/Nursery Boxes	0	5	0	0	5.0
Nesting Structure Maintenance	0	25	0	0	5.0
Wildlife Tree Inventory/Program	0	0	0	1	5.0
Wildlife Tree Habitat Improvement	150	0	0	0	25.0
Wildlife Project Monitoring	0	0	0	1	6.0
Wildlife Project Maintenance	100	0	0	1	20.0
Wildlife Information & Education	0	0	0	1	5.0
DISTRICT TOTAL	485	30	0	9	222.0
Quilcene Ranger District					
Nest Box Installation	0	50	0	0	3.0
Road Closure	0	1	0	0	3.0
Snag Closure	0	30	0	0	5.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
DISTRICT TOTAL	0	81	0	0	11.0
Quinault Ranger District					
Wetland Enhancement	0	0	0	0	0.0
Road Management/Maintenance	0	0	0	0	0.0
Big Game Forage Seeding	0	0	0	0	0.0
Habitat Enhancement	0	0	0	0	0.0
Snag Creation	0	0	0	0	0.0
Nest Boxes/Maintenance	0	0	0	0	0.0
Nest Box Monitoring	0	0	0	0	0.0
Elk Winter Range Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	0	0.0
Soleduck Ranger District					
Aerial Seeding - KV	150	0	0	0	39.0
West End Elk Study	0	0	0	0	50.0
Snag Inventory	0	0	0	0	10.5
Wildlife Tree Blasting - KV	0	150	0	0	20.0
Basin Elk & Deer Management Plan	0	0	0	0	15.0
Monitoring & Maintenance	0	0	0	0	15.0
Grouse Inventory	0	0	0	0	10.0
Road Closures	0	2	0	0	2.0
Aerial Seeding Evaluation	100	0	0	0	20.0
Wildlife Habitat Structure Improvement	0	15	0	0	20.0
Wildlife Non-Structure Improvement	10	0	0	0	50.0
DISTRICT TOTAL	260	167	0	0	251.5
FISCAL YEAR TOTAL	745	278	0	9	484.5
FISCAL YEAR 1994					
Hood Canal Ranger District					
Pond/Wetland/Meadow Inventory	0	0	0	1	15.0
Pond/Wetland/Meadow Habitat Improvement	0	0	0	1	45.0
Wynoochee Reservoir Rehabilitation	5	0	0	0	15.0
Riparian Rehabilitation	20	0	0	0	15.0
Sub-Basin Big Game Management	0	0	0	1	5.0
Big Game Habitat Improvement	100	0	0	0	9.0
Road Closure Habitat Improvement	100	0	0	0	5.0
Roadside Forage Improvement	10	0	0	0	18.0
Special Wildlife Sites Inventory	0	0	0	1	11.0
Raptor Nest Survey	0	0	0	1	13.0
Bat Roost/Nursery Boxes	0	5	0	0	5.0
Nesting Structure Maintenance	0	25	0	0	5.0
Wildlife Tree Inventory/Program	0	0	0	1	5.0
Wildlife Tree Habitat Improvement	150	0	0	0	25.0
Wildlife Project Monitoring	0	0	0	1	6.0
Wildlife Project Maintenance	100	0	0	1	20.0
Wildlife Information & Education	0	0	0	1	5.0
DISTRICT TOTAL	485	30	0	9	222.0
Quilcene Ranger District					
Nest Box Maintenance	0	0	0	1	1.0
DISTRICT TOTAL	0	0	0	1	1.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
Quinault Ranger District					
Wetland Enhancement	0	0	0	0	0.0
Road Management/Maintenance	0	0	0	0	0.0
Big Game Forage Seeding	0	0	0	0	0.0
Habitat Enhancement	0	0	0	0	0.0
Snag Creation	0	0	0	0	0.0
Nest Boxes/Maintenance	0	0	0	0	0.0
Nest Box Monitoring	0	0	0	0	0.0
Elk Winter Range Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	0	0.0
Soleduck Ranger District					
Snag Inventory	0	0	0	0	10.5
Wildlife Tree Blasting - KV	0	150	0	0	20.0
Basin Elk & Deer Management Plan	0	0	0	0	15.0
West End Elk Study	0	0	0	0	50.0
Monitoring & Maintenance	0	0	0	0	20.0
Aerial Seeding - KV	150	0	0	0	39.0
Wildlife Structure Improvement	0	25	0	0	40.0
Wildlife Non-Structure Improvement	10	0	0	0	50.0
DISTRICT TOTAL	160	175	0	0	244.5
FISCAL YEAR TOTAL	645	205	0	10	467.5
FISCAL YEAR 1995					
Hood Canal Ranger District					
Pond/Wetland/Meadow Inventory	0	0	0	1	15.0
Pond/Wetland/Meadow Habitat Improvement	0	0	0	1	45.0
Wynoochee Reservoir Rehabilitation	5	0	0	0	15.0
Riparian Rehabilitation	20	0	0	0	15.0
Sub-Basin Big Game Management	0	0	0	1	5.0
Nest Boxes at Denny Ahl Orchard	0	15	0	0	5.0
Big Game Habitat Improvement	100	0	0	0	9.0
Road Closure Habitat Improvement	100	0	0	0	5.0
Roadside Forage Improvement	10	0	0	0	18.0
Special Wildlife Sites Inventory	0	0	0	1	11.0
Raptor Nest Survey	0	0	0	1	13.0
Bat Roost/Nursery Boxes	0	5	0	0	5.0
Nesting Structure Maintenance	0	25	0	0	5.0
Wildlife Tree Inventory/Program	0	0	0	1	5.0
Wildlife Tree Habitat Improvement	150	0	0	0	25.0
Wildlife Project Monitoring	0	0	0	1	6.0
Wildlife Project Maintenance	100	0	0	1	20.0
Wildlife Information & Education	0	0	0	1	5.0
DISTRICT TOTAL	485	45	0	9	227.0
Quilcene Ranger District					
Nest Box Maintenance	0	0	0	1	1.0
DISTRICT TOTAL	0	0	0	1	1.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
Quinault Ranger District					
Wetland Enhancement	0	0	0	0	0.0
Road Management/Maintenance	0	0	0	0	0.0
Big Game Forage Seeding	0	0	0	0	0.0
Habitat Enhancement	0	0	0	0	0.0
Snag Creation	0	0	0	0	0.0
Nest Boxes/Maintenance	0	0	0	0	0.0
Nest Box Monitoring	0	0	0	0	0.0
Elk Management Plan	0	0	0	0	1.0
Band-Tailed Pigeon Survey	0	0	0	0	0.0
Wildlife Tree Monitoring	0	0	0	0	0.0
Elk Winter Range Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	0	1.0
Soleduck Ranger District					
Aerial Seeding - KV	150	0	0	0	39.0
Nest Platforms	0	3	0	0	1.5
Bat Roosting Improvement	0	10	0	0	3.0
West End Elk Study	0	0	0	0	35.0
Snag Inventory	0	0	0	0	10.5
Wildlife Tree Blasting - KV	0	150	0	0	20.0
Basin Elk & Deer Management Plan	0	0	0	0	15.0
Monitoring & Maintenance	0	0	0	0	30.0
Wildlife Structure Improvement	0	25	0	0	40.0
Wildlife Non-Structure Improvement	10	0	0	0	50.0
DISTRICT TOAL	160	188	0	0	244.0
FISCAL YEAR TOTAL	645	233	0	10	473.0
GRAND TOTAL	3,363	1,144	0	57	2,481.0

FISHERIES

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
FISCAL YEAR 1991					
Hood Canal Ranger District					
Fish Habitat/Inventory	0	0	42	0	20.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	10	0	0	10.0
Anadromous Fish Habitat Improvement	0	45	0	1	40.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	2	0	0	0	1.0
Fish Habitat Improvement Maintenance	0	60	0	0	3.0
DISTRICT TOTAL	4	115	42	15	130.0
Quilcene Ranger District					
Fish Habitat Inventory	0	0	22	0	10.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	15	0	0	15.0
Anadromous Fish Habitat Improvement	0	25	0	0	25.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	3	0	0	0	1.5
Fish Habitat Improvement	0	50	0	0	2.5
DISTRICT TOTAL	5	90	22	14	110.0
Quinault Ranger District					
Habitat & Fish Inventory	0	0	75	0	37.5
Structure Maintenance	0	160	0	0	25.0
Resident Fish Habitat Improvement	3	0	0	0	10.0
DISTRICT TOTAL	3	160	75	0	72.5
Soleduck Ranger District					
Pistol Creek Log Jam Removal	3	0	0	6	8.5
Hyas Creek Pond	2	0	0	0	45.0
S. Fork Calawah Improvement	0	70	0	0	70.0
N Fork Sitkum Barrier Removal Plan - KV	0	0	0	0	3.0
Eagle Creek Rearing Pond	2	0	0	5	18.0
Calawah Basin Management Plan	0	0	0	0	5.5
Alcee Creek Improvement - KV	0	25	0	0	25.0
Bockman Creek Improvement - KV	0	15	0	0	15.0
Goodman Creek Improvement - KV	0	25	0	0	25.0
Stream Surveys	0	0	110	0	55.0
Monitoring & Maintenance	0	0	0	0	12.0
Fish Pond Interpretive Sites	0	0	0	0	2.0
Spawner Surveys	0	0	25	0	3.5
Resident Fish Stock Determination	0	0	0	0	30.0
DISTRICT TOTAL	7	135	135	11	317.5
FISCAL YEAR TOTAL	19	500	274	40	630.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
FISCAL YEAR 1992					
Hood Canal Ranger District					
Fish Habitat Inventory	0	0	42	0	20.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	20	0	0	20.0
Anadromous Fish Habitat Improvement	0	50	0	0	50.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	4	0	0	0	2.0
Fish Habitat Improvement Maintenance	0	115	0	0	5.0
DISTRICT TOTAL	6	185	42	14	153.0
Quilcene Ranger District					
Fish Habitat Inventory	0	0	22	0	10.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	10	0	0	10.0
Anadromous Fish Habitat Improvement	0	30	0	1	30.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	3	0	0	0	1.5
Fish Habitat Improvement Maintenance	0	90	0	0	3.5
DISTRICT TOTAL	5	130	22	15	111.0
Quinault Ranger District					
Habitat & Fish Inventory	0	0	105	0	52.5
Anadromous Fish Habitat Improvement	0	30	0	0	25.4
Structure Maintenance	0	40	0	0	5.0
Barrier Removal	0	0	0	3	30.0
Resident Fish Habitat Improvement	3	0	0	0	10.0
DISTRICT TOTAL	3	70	105	3	122.9
Soleduck Ranger District					
Pistol Creek Log Jam Removal - KV	1	0	0	0	6.0
Albion Creek Barrier Modification - KV	2	0	0	0	11.0
N Fork Sitkum Barrier Modification - KV	5	0	0	0	9.5
Camp Creek Improvement - KV	0	60	0	0	60.0
Soleduck River Basin Management Plan	0	0	0	0	5.5
S. Fork Soleduck Improvement	0	170	2	0	240.0
Monitoring & Maintenance	0	0	0	0	21.5
Stream Surveys	0	0	100	0	50.0
Spawner Surveys	0	0	25	0	3.5
Hyas Creek Interpretive Site	0	0	0	0	1.0
Resident Fish Stock Determination	0	0	0	0	30.0
DISTRICT TOTAL	8	230	127	0	438.0
FISCAL YEAR TOTAL	22	615	296	32	824.9

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
FISCAL YEAR 1993					
Hood Canal Ranger District					
Fish Habitat Inventory	0	0	42	0	20.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	0	0	0	0.0
Anadromous Fish Habitat Improvement	0	60	0	0	60.0
Resident Fish Habitat Improvement	4	0	0	0	2.0
Anadromous Fish Habitat Improvement	4	0	0	0	2.0
Fish Habitat Improvement Maintenance	0	185	0	0	9.0
DISTRICT TOTAL	8	245	42	14	148.0
Quilcene Ranger District					
Fish Habitat Inventory	0	0	22	0	10.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	20	0	0	20.0
Anadromous Fish Habitat Improvement	0	30	0	0	30.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	3	0	0	0	1.5
Fish Habitat Improvement	0	140	0	0	4.5
DISTRICT TOTAL	5	190	22	14	122.0
Quinalt Ranger District					
Sensitive Aquatic Instream Inventory	0	0	98	0	10.0
Structure Monitoring Fish	0	30	0	0	4.0
Structure Maintenance	0	40	0	0	5.0
Anadromous Fish Habitat Improvement	0	15	0	0	15.0
Barrier Removal Monitor	0	0	0	3	4.0
Barrier Removal	0	0	0	3	30.0
Resident Fish Habitat Improvement	3	0	0	0	10.0
DISTRICT TOTAL	3	85	98	6	78.0
Soleduck Ranger District					
Fish Structure Improvement - KV	0	200	0	0	200.0
Fish Non-Structure Improvement - KV	10	0	0	0	150.0
Stream Surveys	0	0	60	0	30.0
Spawner Surveys	0	0	25	0	3.5
Monitoring & Maintenance	0	0	0	0	30.0
Resident Fish Stock Determination	0	0	0	0	30.0
DISTRICT TOTAL	10	200	85	0	443.5
FISCAL YEAR TOTAL	26	720	247	34	791.5
FISCAL YEAR 1994					
Hood Canal Ranger District					
Fish Habitat Inventory	0	0	42	0	20.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	20	0	0	20.0
Anadromous Fish Habitat Improvement	0	65	0	1	65.0
Resident Fish Habitat Improvement	4	0	0	0	2.0
Anadromous Fish Habitat Improvement	4	0	0	0	2.0
Fish Habitat Improvement Maintenance	0	245	0	0	12.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
DISTRICT TOTAL	8	330	42	15	176.0
Quilcene Ranger District					
Fish Habitat Inventory	0	0	22	0	10.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	15	0	0	15.0
Anadromous Fish Habitat Improvement	0	25	0	0	25.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	3	0	0	0	1.5
Fish Habitat Improvement	0	180	0	0	5.5
DISTRICT TOTAL	5	220	22	14	113.0
Quinalt Ranger District					
Sensitive Aquatic Instream Inventory	0	0	75	0	10.0
Structure Monitoring Fish	0	60	0	0	10.0
Structure Maintenance	0	40	0	0	5.0
Anadromous Fish Habitat Improvement	0	15	0	0	15.0
Barrier Removal Monitor	0	0	0	6	8.0
Barrier Removal	0	0	0	3	30.0
Resident Fish Habitat Improvement	3	0	0	0	10.0
DISTRICT TOTAL	3	115	75	9	88.0
Soleduck Ranger District					
Fish Structure Improvement - KV	0	200	0	0	200.0
Fish Non-Structure Improvement - KV	10	0	0	0	150.0
Stream Surveys	0	0	60	0	30.0
Spawner Surveys	0	0	25	0	3.5
Monitoring & Maintenance	0	0	0	0	40.0
DISTRICT TOTAL	10	200	85	0	423.5
FISCAL YEAR TOTAL	26	865	224	38	800.5
FISCAL YEAR 1995					
Hood Canal Ranger District					
Fish Habitat Inventory	0	0	42	0	20.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	5	0	0	5.0
Anadromous Fish Habitat Improvement	0	55	0	0	55.0
Resident Fish Habitat Improvement	4	0	0	0	2.0
Anadromous Fish Habitat Improvement	6	0	0	0	3.0
Fish Habitat Improvement Maintenance	0	330	0	0	16.0
DISTRICT TOTAL	10	390	42	14	156.0
Quilcene Ranger District					
Fish Habitat Inventory	0	0	22	0	10.0
Fish Habitat Planning	0	0	0	4	5.0
Fish Habitat Monitoring	0	0	0	10	50.0
Resident Fish Habitat Improvement	0	20	0	0	20.0
Anadromous Fish Habitat Improvement	0	25	0	0	25.0
Resident Fish Habitat Improvement	2	0	0	0	1.0
Anadromous Fish Habitat Improvement	3	0	0	0	1.5
Fish Habitat Improvement	0	225	0	0	6.5

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
DISTRICT TOTAL	5	270	22	14	119.0
Quinault Ranger District					
Sensitive Aquatic Instream Inventory	0	0	105	0	12.0
Structure Monitoring Fish	0	90	0	0	12.0
Structure Maintenance	0	80	0	0	10.0
Anadromous Fish Habitat Improvement	0	15	0	0	15.0
Barrier Removal Monitor	0	0	0	9	12.0
Barrier Removal	0	0	0	3	30.0
Resident Fish Habitat Improvement	3	0	0	0	10.0
DISTRICT TOTAL	3	185	105	12	101.0
Soleduck Ranger District					
Fish Structure Improvement - KV	0	200	0	0	200.0
Fish Non-Structure Improvement - KV	5	0	0	0	50.0
Stream Surveys	0	0	60	0	30.0
Spawner Surveys	0	0	25	0	3.5
Monitoring & Maintenance	0	0	0	0	50.0
DISTRICT TOAL	5	200	85	0	333.5
FISCAL YEAR TOTAL	23	1,045	254	40	709.5
GRAND TOTAL	116	3,745	1,295	181	3,756.4

THREATENED, ENDANGERED, AND SENSITIVE SPECIES

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
FISCAL YEAR 1991					
Hood Canal Ranger District					
Bald Eagle Inventory	0	0	0	6	4.5
Bald Eagle Management Plan	0	0	0	1	5.0
Spotted Owl Monitoring	0	0	0	12	65.5
Spotted Owl Habitat Rating/Catalog	0	0	0	2	7.5
Spotted Owl Banding Program	0	0	0	20	10.0
Spotted Owl Habitat Vegetation Inventory	0	0	0	0	40.0
Spotted Owl Management Plans	0	0	0	2	12.0
Olympic Mud Minnow Inventory	0	0	0	10	25.0
Marbled Murrelet Survey	0	0	0	3	25.5
PETS Species Survey (Areas #1)	0	0	0	1	10.0
Three Peaks Botanical Area Survey	0	0	0	1	10.0
Gold Chinquapin Survey	0	0	0	3	5.0
DISTRICT TOTAL	0	0	0	61	220.0
Hood Canal/Quilcene Ranger Districts					
Peregrine Falcon Cliff Survey	0	0	0	10	6.2
DISTRICT TOTAL	0	0	0	10	6.2
Quilcene Ranger District					
Spotted Owl R6 Monitoring	0	0	0	10	25.0
Spotted Owl Reproduction Surveys	0	0	0	3	6.0
Marbled Murrelet Surveys	0	0	0	1	15.0
Eagle General Survey - Winter	0	0	0	1	5.0
Eagle General Survey - Breeding	0	0	0	1	5.0
Sensitive Plant Surveys	0	0	0	5	10.0
DISTRICT TOTAL	0	0	0	21	66.0
Quinault Ranger District					
Marbled Murrelet Survey	0	0	0	0	0.0
Spotted Owl Survey	0	0	0	0	0.0
Bald Eagle/Osprey Nest Survey	0	0	0	0	0.0
Bald Eagle Communal Roost Survey	0	0	0	0	0.0
Sensitive Plant Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	0	0.0
Soleduck Ranger District					
Spotted Owl Survey	0	0	0	0	25.0
Peregrine Falcon Survey	0	0	0	0	2.5
Marbled Murrelet Survey	0	0	0	0	10.0
Sensitive Plant Survey	0	0	0	0	15.0
Bald Eagle Management Plans	0	0	0	0	7.5
Photo Herbarium	0	0	0	0	1.0
Eagle Platforms - KV	0	3	0	0	3.0
Spotted Owl Habitat Typing	0	0	0	0	20.0
Marbled Murrelet Management Plans	0	0	0	0	10.0
Spotted Owl Prey District Study	0	0	0	0	10.0
Maintenance & Monitoring	0	0	0	0	1.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
DISTRICT TOTAL	0	3	0	0	105.0
FISCAL YEAR TOTAL	0	3	0	92	397.2
FISCAL YEAR 1992					
Hood Canal Ranger District					
Bald Eagle Inventory	0	0	0	6	4.5
Bald Eagle Management Plan	0	0	0	1	5.0
Spotted Owl Monitoring	0	0	0	12	65.5
Spotted Owl Habitat Rating/Catalog	0	0	0	2	7.5
Spotted Owl Banding Program	0	0	0	20	10.0
Spotted Owl Habitat Vegetation Inventory	0	0	0	0	40.0
Spotted Owl Management Plans	0	0	0	3	15.0
Spotted Owl Habitat Recovery Plan	0	0	0	1	10.0
Olympic Mud Minnow Inventory	0	0	0	10	25.5
Marbled Murrelet Survey	0	0	0	3	25.5
PETS Species Survey (Area #2)	0	0	0	1	10.0
PETS Species Management Plan (Area #1)	0	0	0	1	10.0
Three Peaks Botanical Area Plan	0	0	0	1	10.0
Golden Chinquapin Management Plan	0	0	0	1	5.0
Golden Chinquapin Survey	0	0	0	3	5.0
DISTRICT TOTAL	0	0	0	65	248.0
Hood Canal/Quilcene Ranger Districts					
Peregrine Falcon Cliff Survey	0	0	0	10	6.2
DISTRICT TOTAL	0	0	0	10	6.2
Quilcene Ranger District					
Spotted Owl R6 Monitoring	0	0	0	10	25.0
Spotted Owl Surveys	0	0	0	3	6.0
Marbled Murrelet Surveys	0	0	0	1	15.0
Bald Eagle Winter Surveys	0	0	0	1	5.0
Sensitive Plant Surveys	0	0	0	5	10.0
DISTRICT TOTAL	0	0	0	20	61.0
Quinalt Ranger District					
Marbled Murrelet Survey	0	0	0	0	0.0
Spotted Owl Survey	0	0	0	0	0.0
Bald Eagle/Osprey Nest Survey	0	0	0	0	0.0
Bald Eagle Communal Roost Survey	0	0	0	0	0.0
Bald Eagle Management Plan	0	0	0	0	1.0
Sensitive Plant Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	0	1.0
Soleduck Ranger District					
Spotted Owl Survey	0	0	0	0	25.0
Marbled Murrelet Inventory	0	0	0	0	10.0
Sensitive Plant Survey	0	0	0	0	15.0
Spotted Owl Habitat Typing	0	0	0	0	20.0
Spotted Owl Prey District Study	0	0	0	0	10.0
Eagle Platforms - KV	0	2	0	0	2.0
Monitoring & Maintenance	0	0	0	0	2.0
DISTRICT TOTAL	0	2	0	0	84.0
FISCAL YEAR TOTAL	0	2	0	95	400.0

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
FISCAL YEAR 1993					
Hood Canal Ranger District					
Bald Eagle Monitoring	0	0	0	6	4.5
Bald Eagle Management Plan	0	0	0	1	5.0
Spotted Owl Monitoring	0	0	0	12	65.5
Spotted Owl Habitat Rating/Catalog	0	0	0	1	6.0
Spotted Owl Banding Program	0	0	0	1	10.0
Spotted Owl Habitat Improvement	200	0	0	0	30.0
SOHA Management Plan	0	0	0	0	30.0
Marbled Murrelet Survey	0	0	0	3	45.5
Sensitive Salamander Inventory	0	0	0	4	6.5
Sensitive Bat Inventory	0	0	0	3	5.0
PETS Species Nest Structure (Wildlife)	0	0	0	10	15.5
PETS Species Survey (Area #3)	0	0	0	1	10.0
PETS Species Survey (Area #4)	0	0	0	1	10.0
PETS Species Management Plan (Area #2)	0	0	0	1	10.0
DISTRICT TOTAL	200	0	0	44	253.0
Hood Canal/Quilcene Ranger Districts					
Peregrin Falcon Cliff Survey	0	0	0	10	6.2
DISTRICT TOTAL	0	0	0	10	6.2
Quilcene Ranger District					
Spotted Owl R6 Monitoring	0	0	0	10	25.0
Spotted Owl Reproduction Surveys	0	0	0	3	6.0
Marbled Murrelet Surveys	0	0	0	1	15.0
Bald Eagle Winter Surveys	0	0	0	1	5.0
Bald Eagle Breed Surveys	0	0	0	1	5.0
Sensitive Plant Surveys	0	0	0	5	10.0
DISTRICT TOTAL	0	0	0	21	66.0
Quinault Ranger District					
Marbled Murrelet Survey	0	0	0	0	0.0
Spotted Owl Survey	0	0	0	0	0.0
Bald Eagle/Osprey Nest Survey	0	0	0	0	0.0
Bald Eagle Communal Roost Survey	0	0	0	0	0.0
Sensitive Plant Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	0	0.0
Soleduck Ranger District					
Spotted Owl Survey	0	0	0	0	25.0
Marbled Murrelet Survey	0	0	0	0	10.0
Sensitive Plant Survey	0	0	0	0	15.0
Spotted Owl Habitat Typing	0	0	0	0	20.0
Spotted Owl Prey District Study	0	0	0	0	10.0
Monitoring & Maintenance	0	0	0	0	3.0
DISTRICT TOTAL	0	0	0	0	83.0
FISCAL YEAR TOTAL	200	0	0	75	408.2

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
FISCAL YEAR 1994					
Hood Canal Ranger District					
Bald Eagle Monitoring	0	0	0	6	4.5
Bald Eagle Management Plan	0	0	0	1	5.0
Spotted Owl Monitoring	0	0	0	12	65.5
Spotted Owl Habitat Rating/Catalog	0	0	0	1	6.0
Spotted Owl Banding Program	0	0	0	1	10.0
SOHA Management Plan	0	0	0	0	30.0
Marbled Murrelet Survey	0	0	0	3	45.5
Sensitive Salamander Inventory	0	0	0	4	6.5
Sensitive Bat Inventory	0	0	0	3	5.0
PETS Species Nest Structure (Wildlife)	0	0	0	10	15.5
PETS Species Survey (Area #5)	0	0	0	1	10.0
PETS Species Survey (Area #6)	0	0	0	1	10.0
PETS Species Management Plan (Area #3)	0	0	0	1	10.0
PETS Species Management Plan (Area #4)	0	0	0	1	10.0
DISTRICT TOTAL	0	0	0	45	233.0
Hood Canal/Quillcene Ranger Districts					
Peregrine Falcon Cliff Survey	0	0	0	1	8.2
DISTRICT TOTAL	0	0	0	1	8.2
Quillcene Ranger District					
Spotted Owl R6 Monitoring	0	0	0	10	25.0
Spotted Owl Reproduction Surveys	0	0	0	3	6.0
Marbled Murrelet Surveys	0	0	0	1	15.0
Bald Eagle Winter Surveys	0	0	0	1	5.0
Sensitive Plant Surveys	0	0	0	5	10.0
DISTRICT TOTAL	0	0	0	20	61.0
Quinault Ranger District					
Marbled Murrelet Survey	0	0	0	0	0.0
Spotted Owl Survey	0	0	0	0	0.0
Bald Eagle/Osprey Nest Survey	0	0	0	0	0.0
Bald Eagle Communal Roost Survey	0	0	0	0	0.0
Sensitive Plant Survey	0	0	0	0	0.0
DISTRICT TOTAL	0	0	0	0	0.0
Soleduck Ranger District					
Spotted Owl Survey	0	0	0	0	25.0
Marbled Murrelet Inventory	0	0	0	0	10.0
Sensitive Plant Survey	0	0	0	0	15.0
Spotted Owl Habitat Typing	0	0	0	0	20.0
Monitoring & Maintenance	0	0	0	0	3.5
DISTRICT TOTAL	0	0	0	0	73.5
FISCAL YEAR TOTAL	0	0	0	66	375.7

Activity/Project Name	Acres	Structures	Miles	Projects	FS Dollars (thousands)
FISCAL YEAR 1995					
Hood Canal Ranger District					
Bald Eagle Monitoring	0	0	0	6	4.5
Spotted Owl Monitoring	0	0	0	12	65.5
Spotted Owl Habitat Rating/Catalog	0	0	0	1	6.0
Spotted Owl Banding Program	0	0	0	1	10.0
SOHA Management Plan	0	0	0	0	30.0
Marbled Murrelet Survey	0	0	0	3	45.5
Sensitive Salamander Inventory	0	0	0	4	6.5
Sensitive Salamander Management Plan	0	0	0	4	6.5
Sensitive Bat Inventory	0	0	0	3	5.0
Sensitive Bat Management Plan	0	0	0	1	5.0
PETS Species Nest Structure (Wildlife)	0	0	0	10	15.5
PETS Species Survey (Area #7)	0	0	0	1	10.0
PETS Species Survey (Area #8)	0	0	0	1	10.0
PETS Species Management Plan (Area #5)	0	0	0	0	10.0
PETS Species Management Plan (Area #6)	0	0	0	0	10.0
DISTRICT TOTAL	0	0	0	47	239.5
Quilcene Ranger District					
Spotted Owl R6 Monitoring	0	0	0	10	25.0
Spotted Owl Reproduction Surveys	0	0	0	3	6.0
Marbled Murrelet Surveys	0	0	0	1	15.0
Bald Eagle Winter Surveys	0	0	0	1	5.0
Sensitive Plant Surveys	0	0	0	5	10.0
DISTRICT TOTAL	0	0	0	20	61.0
Quinault Ranger District					
Marbled Murrelet Survey	0	0	0	0	0.0
Spotted Owl Survey	0	0	0	0	0.0
Bald Eagle/Osprey Nest Survey	0	0	0	0	0.0
Bald Eagle Communal Roost Survey	0	0	0	0	0.0
Marbled Murrelet Plan/Data Base	0	0	0	0	1.0
Sensitive Plant Survey	0	0	0	0	1.0
DISTRICT TOTAL	0	0	0	0	2.0
Soleduck Ranger District					
Spotted Owl Survey	0	0	0	0	25.0
Marbled Murrelet Inventory	0	0	0	0	10.0
Sensitive Plant Survey	0	0	0	0	15.0
Spotted Owl Habitat Typing	0	0	0	0	20.0
Monitoring & Maintenance	0	0	0	0	4.0
DISTRICT TOAL	0	0	0	0	74.0
FISCAL YEAR TOTAL	0	0	0	67	376.5
GRAND TOTAL	200	5	0	395	1,957.8

SILVICULTURE ACTIVITIES

Project Name	Unit	Number of Units	Costs (thousands of dollars)
FISCAL YEAR 1991			
Silvicultural Exams	Acre	30,000	450
Sustained Yield Units - Admin	SYU	2	70
Precommercial Thinning	Acre	1,700	325
Aerial Fertilization	Acre	2,000	160
Reforestation (Appropriated Funds)	Acre	450	180
Tree Improvement-Seed Orchard Maintenance	Orchard	1	200
FISCAL YEAR 1992			
Silvicultural Exams	Acre	30,000	450
Sustained Yield Units - Administration	SYU	2	70
Precommercial Thinning	Acre	1,800	342
Aerial Fertilization	Acre	2,000	160
Reforestation (Appropriated Funds)	Acre	350	140
Tree Improvement-Seed Orchard Maintenance	Orchard	1	200
FISCAL YEAR 1993			
Silvicultural Exams	Acre	30,000	450
Sustained Yield Units - Administration	SYU	2	70
Precommercial Thinning	Acre	1,800	342
Aerial Fertilization	Acre	2,000	160
Release and Weeding	Acre	360	58
Reforestation (Appropriated Funds)	Acre	275	110
Tree Improvement-Seed Orchard Maintenance	Orchard	1	200
FISCAL YEAR 1994			
Silvicultural Exams	Acre	30,000	450
Sustained Yield Units - Administration	SYU	2	70
Precommercial Thinning	Acre	1,800	342
Aerial Fertilization	Acre	2,000	160
Release and Weeding	Acre	360	58
Reforestation (Appropriated Funds)	Acre	225	95
Tree Improvement-Seed Orchard Maintenance	Orchard	1	200
FISCAL YEAR 1995			
Silvicultural Exams	Acre	30,000	450
Sustained Yield Units - Administration	SYU	2	70
Precommercial Thinning	Acre	2,000	380
Aerial Fertilization	Acre	2,000	160
Release and Weeding	Acre	360	95
Reforestation (Appropriated Funds)	Acre	225	95
Tree Improvement-Seed Orchard Maintenance	Orchard	1	200
FISCAL YEAR 1996			
Silvicultural Exams	Acre	30,000	450
SYU Administration - Revised SCSYU Plan	SYU	2	170
Precommercial Thinning	Acre	2,000	380
Aerial Fertilization	Acre	2,000	160
Release and Weeding	Acre	360	95
Reforestation (Appropriated Funds)	Acre	225	95
Tree Improvement-Seed Orchard Maintenance	Orchard	1	200

SOIL AND WATER

Project Name	Unit	Measure	Thousands of Dollars
FISCAL YEAR 1991			
All Ranger Districts			
Water Quality and Cumulative Effects Monitoring	Each	60	163.0
Riparian Area Monitoring	Each	8	20.0
Hood Canal Ranger District			
Slope Failure Inventory (Shaffer, Grisdale, Harris IRAA)	Acre	10,000	6.0
Watershed Resource Planning	Plan	1	5.0
Watershed Improvement Construction (Shaffer, and Grisdale IRAA)	Acre	200	200.0
Watershed Improvement Maintenance	Acre	25	25.0
Quilcene Ranger District			
Slope Stabilization Planting	Acre	5	2.5
Sluice-out Stabilization Planting	Acre	5	3.0
Miller Seeder	Acre	20	2.3
Hand Seeding	Acre	20	5.0
Slope Failure Inventory	M Acre	14	7.0
Gold Creek Slide Plan and Work	Acre	4	20.0
Quinault Ranger District			
Watershed Improvement Inventory	M Acre	50	20.0
Watershed Resource Planning	M Acre	50	5.0
Watershed Improvement Maintenance	Each	10	5.0
Upper Quinault Study	Each	1	3.0
Aerial Seeding	Acre	25	4.0
Sidecast Pullback	Cubic Yards	4,000	40.0
Aerial Hydro Mulching	Acre	50	20.0
Soleduck Ranger District			
Sidecast Removal	Cubic Yards	450	45.0
Sidecast Removal FY 92 Plan	Plan	1	5.0
Deadman Hill Slope Stabilization	Acre	100	45.0
Klahanie River Bank Protection	Feet	400	20.0
Klahowya River Bank Protection	Feet	500	30.0
Pistol Creek Slope Stabilization	Acre	250	100.0
S. Fork Soleduck Slope Stabilization Plan	Plan	1	10.0
Snider Creek Bank Stabilization	Feet	400	20.0
Snider Ridge Area Rehabilitation	Acre	250	100.0
YEAR TOTAL			930.8
FISCAL YEAR 1992			
All Ranger Districts			
Water Quality & Cumulative Effects Monitoring	Each	60	121.0
Riparian Area Monitoring	Each	8	20.0
Hood Canal Ranger District			
Slope Failure Inventory (Harris & Cedar IRAA)	Acre	10,000	6.0
Watershed Resource Planning	Plan	1	5.0
Watershed Improvement Construction (Harris IRAA)	Acre	200	200.0
Watershed Improvement Maintenance	Acre	25	25.0

Project Name	Unit	Measure	Thousands of Dollars
Quilcene Ranger District			
Slope Stabilization Planting	Acre	5	2.6
Sluice-out Stabilization Planting	Acre	5	3.1
Miller Seeder	Acre	20	2.4
Hand Seeding	Acre	10	2.6
Slope Failure Inventory	M Acre	14	7.3
Watershed Improvement Construction	Project	5	8.3
Quinalt Ranger District			
Watershed Improvement Inventory	M Acre	50	20.0
Watershed Resource Planning	M Acre	50	5.0
Watershed Resource Administration	M Acre	140	10.0
Watershed Improvement Maintenance	Each	12	6.0
Upper Quinalt Study	Each	1	3.0
Aerial Seeding	Acre	50	10.0
Sidecast Pullback	Cubic Yards	4,000	40.0
Aerial Hydro Mulch	Acre	50	20.0
Compaction Inventory	Acre	2,000	10.0
Hydrology (Qualitative/Quantitative) Inventory	Acre	50,000	10.0
Soleduck Ranger District			
Sidecast Removal	Cubic Yards	450	45.0
Sidecast Removal FY 93 Plan	Plan	1	5.0
N. Fork Sitkum Area Rehabilitation Plan	Plan	1	20.0
S. Fork Soleduck Slope Stratification	Acre	40	15.0
YEAR TOTAL			622.3
FISCAL YEAR 1993			
All Ranger Districts			
Water Quality & Cumulative Effects Monitoring	Each	60	121.0
Riparian Area Monitoring	Each	8	20.0
Hood Canal Ranger District			
Slope Failure Inventory (Cedar & Canyon IRAA)	Acre	10,000	6.0
Watershed Resource Planning	Plan	1	5.0
Watershed Improvement Construction (Cedar IRAA)	Acre	200	200.0
Quilcene Ranger District			
Slope Stabilization Planting	Acre	5	2.7
Sluice-out Stabilization Planting	Acre	5	3.2
Miller Seeder	Acre	20	2.5
Hand Seeding	Acre	10	2.7
Slope Failure Inventory	M Acre	14	7.6
Watershed Improvement Construction	Project	10	16.6
Quinalt Ranger District			
Watershed Improvement Inventory	M Acre	40	20.0
Watershed Resource Planning	M Acre	40	5.0
Watershed Resource Administration	M Acre	150	10.0
Watershed Improvement Maintenance	Each	14	7.0
Upper Quinalt Study	Each	1	3.0
Aerial Seeding	Acre	50	8.0
Sidecast Pullback	Cubic Yards	5,000	40.0
Aerial Hydro Mulching	Acre	50	20.0
Compaction Inventory	Acre	2,000	10.0
Hydrology (Qualitative/Quantitative) Inventory	Acre	50,000	10.0

Project Name	Unit	Measure	Thousands of Dollars
Soleduck Ranger District			
Sidecast Removal	Cubic Yards	450	45.0
Sidecast Removal FY 94 Plan	Plan	1	5.0
Goodman Creek Area Rehabilitation Plan	Plan	1	10.0
N. Fork Sitkum Area Rehabilitation	Acre	350	150.0
YEAR TOTAL			709.3
FISCAL YEAR 1994			
All Ranger Districts			
Water Quality & Cumulative Effects Monitoring	Each	60	121.0
Riparian Area Monitoring	Each	8	20.0
Hood Canal Ranger District			
Slope Failure Inventory (Canyon IRAA)	Acre	10,000	6.0
Watershed Resource Planning	Plan	1	5.0
Watershed Improvement Construction (Canyon IRAA)	Acre	200	200.0
Watershed Improvement Maintenance	Acre	25	25.0
Quilcene Ranger District			
Slope Stabilization Planting	Acre	5	2.8
Sluice-out Stabilization Planting	Acre	5	3.4
Miller Seeder	Acre	20	2.6
Hand Seeding	Acre	10	2.8
Slope Failure Inventory	M Acre	14	7.9
Gold Creek Slide Planning	Plan	1	5.6
Watershed Improvement Construction	Project	15	25.0
Gold Creek Slope Stabilization	Structure	1	75.0
Quinault Ranger District			
Watershed Resource Planning	M Acre	40	5.0
Watershed Resource Administration	M Acre	150	10.0
Watershed Improvement Maintenance	Each	20	10.0
Upper Quinault Study	Each	1	3.0
Aerial Seeding	Each	50	8.0
Sidecast Pullback	Cubic Yard	5,000	40.0
Aerial Hydro Mulch	Acre	100	20.0
Compaction Inventory	Acre	2,000	10.0
Hydrology (Qualitative/Quantitative) Inventory	Acre	40,000	9.0
Soleduck Ranger District			
Sidecast Removal	Cubic Yard	450	45.0
Sidecast Removal FY 95 Plan	Plan	1	5.0
Goodman Creek Area Rehabilitation	Acre	150	60.0
Hyas Creek Area Rehabilitation Plan	Plan	1	10.0
YEAR TOTAL			716.1
FISCAL YEAR 1995			
All Ranger Districts			
Water Quality & Cumulative Effects Monitoring	Each	60	100.0
Riparian Area Monitoring	Each	8	20.0

Project Name	Unit	Measure	Thousands of Dollars
Hood Canal Ranger District			
Slope Failure Inventory (Neby IRAA)	Acre	15,000	8.0
Watershed Resource Planning	Plan	1	5.0
Watershed Improvement Construction (Canyon & Neby IRAA)	Acre	200	200.0
Watershed Improvement Maintenance	Acre	25	25.0
Quilcene Ranger District			
Slope Stabilization Planting	Acre	5	2.9
Sluice-out Stabilization Planting	Acre	5	3.5
Miller Seeder	Acre	20	2.7
Hand Seeding	Acre	10	2.9
Slope Failure Inventory	M Acre	14	8.2
Watershed Improvement Construction	Project	15	25.0
Quinault Ranger District			
Watershed Resource Planning	M Acre	40	5.0
Watershed Resource Administration	M Acre	150	10.0
Watershed Improvement Maintenance	Each	20	10.0
Upper Quinault Study	Each	1	3.0
Aerial Seeding	Acre	100	16.0
Sidecast Pullback	Cubic Yards	5,000	40.0
Aerial Hydro Mulch	Acre	100	20.0
Compaction Inventory	Acre	2,000	10.0
Soleduck Ranger District			
Sidecast Removal	Cubic Yards	450	45.0
Sidecast Removal FY 96 Plan	Plan	1	5.0
Hyas Creek Area Rehabilitation	Acre	100	45.0
YEAR TOTAL			633.2

ROAD AND BRIDGE CAPITAL INVESTMENTS
(Unit of Measure - Miles)

Project Name	Road Number	Unit	Thousands of dollars	Road
FISCAL YEAR 1990				
Dosewallips Roads	2610	6.5	173.0	2
Forest Small Projects	Various	0.1	100.0	1-5
YEAR TOTAL		6.6	273.0	
FISCAL YEAR 1991				
Sadie Creek Culvert	3040	0.1	65.0	5
W. Snider/Pole Patch Preroad	3040	4.0	200.0	5
Dungeness Road	2860	11.3	370.0	2
Fish Mitigation	Various	50.0	50.0	1
Cabin Creek Bridge	25		150.0	1
Forest Small Projects	Various		100.0	1-5
YEAR TOTAL		15.4	935.0	
FISCAL YEAR 1992				
Forest Small Projects	Various		100.0	1-5
Camp Grisdale Road	22	17.0	2,600.0	1
Rugged Ridge		3.3	825.0	5
Hamma Hamma Pave	25	1.5	200.0	1
Road 30-3.88 Culvert	30		21.0	5
Fish Mitigation	Various		50.0	1
Big Creek Camp Grisdale Expansion Roads		1.4	120.0	1
YEAR TOTAL		23.2	3,916.0	
FISCAL YEAR 1993				
Hamma Hamma Reconstruction	25	5.7	765.0	1
Quilcene Bridge Replacement	2,860		270.0	2
Little River Bridge	3030-0.2		175.0	5
Fish Mitigation	Various		50.0	1
Cedar Flats	2,847	3.0	250.0	2
Forest Small Projects	Various		100.0	1-5
YEAR TOTAL		8.7	1,610.0	
FISCAL YEAR 1994				
Sitkum-Soleduck	29	9.2	1,200.0	5
Road 22 Reconstruction	22	5.0	800.0	3
Fish Mitigation	Various		50.0	1
Administration Site Paving	2272-130	1.0	75.0	3
Forest Small Projects	Various		100.0	1-5
Rainforest Camp Grisdale Roads		0.7	300.0	3
YEAR TOTAL		15.9	2,525.0	

Project Name	Road Number	Unit	Thousands of dollars	Road
FISCAL YEAR 1995				
Donohue Bridge	2920-2.2		130.0	5
Road 30 Structures	30		200.0	5
Rockline Reconstruction	2204	4.8	500.0	3
Road 23 Reconstruction	23	2.7	650.0	1
Road 24 Reconstruction	24	4.0	500.0	1
Forest Small Project	Various		100.0	1-5
Oxbow Camp Grisdale Roads		1.3	170.0	1
YEAR TOTAL		12.8	2,250.0	

BUILDINGS, WATER, AND SEWER CAPITAL INVESTMENTS

Project Name	Thousands of Dollars
FISCAL YEAR 1991	
Quinault Ranger District	
Falls Creek WC Barracks	250.0
Falls Creek WC Shop/Equipment Storage	490.0
Falls Creek WC Warehouse & Flammable Storage	600.0
FISCAL YEAR 1992	
Quinault Ranger District	
Inlet Tank at Quinault Sewer Treatment Plant	110.0
Expand Sewer Treatment Plant & Drainfield	200.0
New Waterline along South Shore Road	30.0
FISCAL YEAR 1993	
Soleduck Ranger District	
Purchase Soleduck Office	1,000.0
Wellness Building	75.0
FISCAL YEAR 1994	
Soleduck Ranger District	
Snider WC Shop/Equipment Storage	490.0
Snider WC Bunkhouses	500.0
FISCAL YEAR 1995	
Soleduck Ranger District	
Soleduck Ranger District Warehouse	330.0
Quilcene Ranger District	
Quilcene Shop/Warehouse	450.0
Quilcene Office Expansion	50.0
Quilcene Barracks	100.0

SPECIAL USE ADMINISTRATION

Project Name/Type	Unit of Measure	Number of Units	Costs (Thousands of Dollars)
FIRST 5 YEARS, 1991-1995			
All Ranger Districts	Cases	1,250	325.0
SECOND 5 YEARS, 1996-2000			
All Ranger Districts	Cases	1,500	400.0

LAND EXCHANGE

Project Name/Type	Unit of Measure	Number of Units	Costs (Thousands of Dollars)
FIRST 5 YEARS, 1991-1995			
All Ranger Districts			
Various Owners Private Land	M Acres	23.0	80.0
SECOND 5 YEARS, 1996-2000			
All Ranger Districts			
Various Owners Private Land	M Acres	2.0	40.0

RIGHTS OF WAY ACQUISITION

Project Name/Type	Unit of Measure	Number of Units	Costs (Thousands of Dollars)
FIRST 5 YEARS, 1991-1995			
All Ranger Districts	Cases	10	75.0
SECOND 5 YEARS, 1996-2000			
All Ranger Districts	Cases	10	95.0

LAND LINE LOCATION

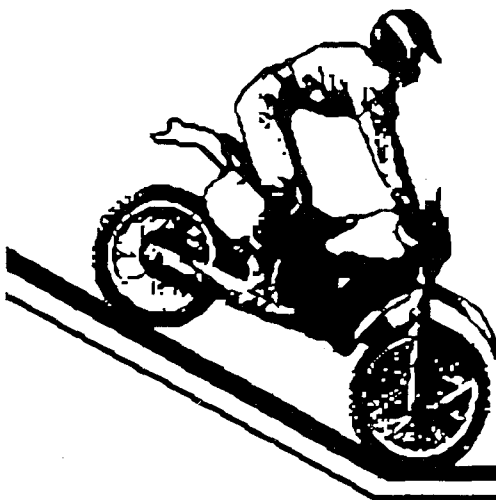
Project Name/Type	Unit of Measure	Number of Units	Costs (Thousands of Dollars)
FIRST 5 YEARS, 1991-1995			
All Ranger Districts	Miles	100	900.0
SECOND 5 YEARS, 1996-2000			
All Ranger Districts	Miles	125	1,100.0

MINERALS MANAGEMENT

Project Name/Type	Unit of Measure	Number of Units	Costs (Thousands of Dollars)
FIRST 5 YEARS, 1991-1995			
All Ranger Districts	Cases	100	65.0
SECOND 5 YEARS, 1996-2000			
All Ranger Districts	Cases	150	75.0

Appendix B

Monitoring Worksheets



Olympic National Forest

APPENDIX B

MONITORING WORKSHEETS

INTRODUCTION

This appendix contains the monitoring worksheets which served as the basis for development of the monitoring plan outlined in Chapter V of this Forest Plan. Each worksheet presents, for each of the monitoring topics evaluated, the details of the 13-step process used to identify monitoring needs and generate a monitoring plan. This process is described in Chapter V. The definitions and explanations of the 13 individual steps are repeated here, in order to facilitate understanding of the worksheets which follow.

1. **MONITORING TOPIC:** These relate to the public issues, management concerns and resource management opportunities (ICOs) the Forest Plan was designed to address. A full discussion of the ICOs can be found in Chapter I and Appendix A of the FEIS. They are also summarized in Chapter I of this document. In addition to the monitoring topics identified that respond to ICOs, other topics have been added to ensure complete monitoring coverage.
2. **THRESHOLD OF VARIABILITY:** This is the variation from the expected outputs, or activities, that is permitted before corrective action or further evaluation is necessary.
3. **MONITORING QUESTIONS:** These questions are the core of the intent for monitoring. The essence of each question is, "Are things going as the Forest Plan intended?" Information is generally included in the question to indicate the variance from the target quantity which is acceptable. Information to answer these will be obtained and analyzed using valid statistical procedures.
4. **SUGGESTED METHODS/INFORMATION SOURCES:** For each monitoring question, methods and/or sources of information are suggested. The purpose of this section is only to suggest reasonable methods or sources of information. It is not intended to exclude other methods as long as information will respond to the questions at a reasonable cost.

For single resource monitoring activities, the person responsible for the monitoring activity will determine which technique is best at the time of data gathering. Data will be collected in a manner that ensures meeting statistical parameters suggested by the monitoring questions. For interdisciplinary reviews, the Forest Supervisor will select team members who represent appropriate resources, considering the monitoring question(s) involved. A team leader will be designated. This person will be responsible for preparing and submitting a report of the findings of the monitoring activity.

5. **UNIT OF MEASURE:** This is a quantifiable measure of the output, action or effect being monitored.
6. **MONITORING FREQUENCY:** For each monitoring question, the frequency with which it must be addressed is indicated. A report will be prepared by the person responsible for the monitoring activity. The report will be submitted to a Monitoring Coordinator, who will summarize findings from

INTRODUCTION

all reports due that reporting period (usually a year). This summary report will be submitted to the Forest Supervisor. Copies of the summary report, and of the individual reports, will be kept on file at the Forest headquarters. The summary report may also be distributed to other interested agencies and the public.

7. **PRECISION AND RELIABILITY:** This indicates the validity and exactness with which monitoring data are to be collected. Precision is the exactness or accuracy of measurement. Reliability is the expected probability that information acquired through sampling will reflect actual conditions. Precision and reliability are rated as follows:

High - Maximum variation within 10 percent of sample mean.

Moderate - Maximum variation within 33 percent of sample mean.

Low - Maximum variation within 50 percent of sample mean.

8. **DATA STORAGE:** This is where collected monitoring data, analyses and evaluation reports for the monitoring question are stored. The information will be stored for the duration of the Forest Plan.
9. **REPORTS DUE:** This is the date by which reports responding to monitoring questions must be submitted. Suggested possible causes for unfavorable reports are listed. Unfavorable reports are those which indicate that actual conditions are outside expected results of the Forest Plan.
10. **COST:** Costs are estimated and shown as an annual cost for all monitoring activities associated with each monitoring question. When work or reports are not done on an annual basis, costs shown are the average annual cost over a ten-year period. Included in parentheses are the year and expected cost for the actual monitoring activity. Example: "\$1,000 (year 5, \$5,000 and year 10, \$5,000)" means a total annual cost of \$1,000, but \$5,000 will be needed in year 5 of the plan period and another \$5,000 in year 10.

The component of total annual cost currently included in normal operating costs (if any) is shown in parentheses. Ex: \$3,000 (\$2,000) means a total annual cost of \$3,000 of which \$2,000 is currently included in the Forest's operating budget.

11. **RESPONSIBILITY:** The person responsible for responding to the monitoring question.
12. **RESEARCH NEEDS:** Indicates additional research is needed to aid in fully responding to the monitoring question.
13. **INVENTORY NEEDS:** Indicates additional data is needed to fully respond to the monitoring question.

INDIVIDUAL MONITORING WORKSHEETS

The worksheets for the monitoring topics upon which the Forest's monitoring plan is based, are presented in the following pages.

MONITORING TOPIC: Semi-Primitive and Primitive Recreation

The goal is to provide a variety of undeveloped recreation opportunities in areas characterized by a predominantly natural or natural-appearing environment in which the criteria for Semi-Primitive or Primitive settings are met (applies to areas outside of Wilderness).

THRESHOLD OF VARIABILITY:

When the desired physical, social and managerial setting criteria for Primitive or Semi-Primitive ROS classes are not being met, or acres are reduced within an area that is allocated to Underdeveloped Recreation (Motorized) or Underdeveloped Recreation (Non-Motorized).

MONITORING QUESTION:

Are the areas allocated to Semi-Primitive and Primitive use providing Semi-Primitive and Primitive opportunities?

SUGGESTED METHODS/INFORMATION SOURCES:

Field review involving visitor contacts and observation of resource conditions. Inventory use levels with trail registers and field counts.

UNIT OF MEASURE:

Acres by ROS class and ROS criteria. Recreation Visitors Days of use per acre and number of visitor encounters.

MONITORING FREQUENCY:

Annually.

PRECISION AND RELIABILITY:

Moderate to high.

DATA STORAGE:

Inventory cards and Recreation Information Management system, (RIM).

REPORTS DUE:

Recreation Information Management RVD Report, annually.

SEMI-PRIMITIVE AND PRIMITIVE RECREATION

COSTS:

\$5,000

RESPONSIBILITY:

Recreation Staff

RESEARCH NEEDS:

Research recreation use by activity, site/area, and ROS classes and develop a reliable method for determining RVDs for undeveloped recreation.

INVENTORY NEEDS:

Inventory undeveloped campsites and record data. Implement the Limits of Acceptable Change process in high use areas.

MONITORING TOPIC: Trails

The goal is to provide a range of trail user opportunities in a variety of Recreational Opportunity Spectrum classes that meet trail management objectives and demand, and avoid conflicts between different types of users.

THRESHOLD OF VARIABILITY:

Zero cases with documented incidents of user conflicts or resource damage, i.e., no cases are permitted before corrective action or further evaluation is necessary.

MONITORING QUESTION:

Are trail management objectives and demand being met? Are there any conflicts between user types?

SUGGESTED METHOD/INFORMATION SOURCES:

Field review and trail registers. Written public comments concerning conflicts.

UNIT OF MEASURE:

Documented or written notification of user conflicts or resource damage.

MONITORING FREQUENCY:

Annually.

PRECISION AND RELIABILITY:

High.

DATA STORAGE:

Recreation Information Management (RIM) system, trail registers and RIM_TRIS database. District and S.O. 2300 Files.

REPORTS DUE:

Recreation Information Management RVD Report, annually.

TRAILS

COSTS:

\$10,000.

RESPONSIBILITY:

Recreation Staff.

RESEARCH NEEDS:

Research the different types of trail use (hiker, stock, mountain bicycles, motorbikes, etc.) to determine if and how they affect one another.

INVENTORY NEEDS:

None needed.

MONITORING TOPIC: Scenery

The goal is to manage specific landscapes in such a manner that their scenic values are protected, maintained, and/or enhanced as viewed from major travel routes, use areas, or water bodies.

THRESHOLD OF VARIABILITY:

When more than 10 percent of acres in a given management area are not in compliance with the Visual Quality Objectives of Retention and Partial Retention.

MONITORING QUESTION:

Are Visual Quality Objectives being met?

SUGGESTED METHODS/INFORMATION SOURCES:

Field reviews, camera points, and visual analysis.

UNIT OF MEASURE:

Acres by VQO (Retention and Partial Retention).

MONITORING FREQUENCY:

Annually.

PRECISION AND RELIABILITY:

High.

DATA STORAGE:

District and S.O. 2300 files.

REPORTS DUE:

Three year intervals.

COSTS:

\$8,000.

SCENERY

RESPONSIBILITY:

Recreation Staff.

RESEARCH NEEDS:

Research how Forest visitors perceive the various Forest resource management activities and their visual impacts upon scenery.

INVENTORY NEEDS:

Inventory Forest travel routes and use areas to determine if current use warrant a change in the visitor sensitivity levels.

MONITORING TOPIC: Developed Recreation Sites

The goal is to provide readily accessible, appropriately designed and maintained facilities that will meet demand for concentrated use by people seeking a convenient recreational experience. Management is aimed at providing a range of activities involving developed opportunities along the Recreation Opportunity Spectrum.

THRESHOLD OF VARIABILITY:

Use is less than 40 percent of Theoretical Capacity, i.e., when use exceeds 40 percent corrective action or further evaluation is necessary.

MONITORING QUESTION:

Are sites consistently receiving heavy use approaching or exceeding Theoretical Capacity?

SUGGESTED METHODS/INFORMATION SOURCES:

Estimate use at sites by random sample counts and counting fee envelopes.

UNIT OF MEASURE:

Recreation Visitor Days of use.

MONITORING FREQUENCY:

Annually.

PRECISION AND RELIABILITY:

High.

DATA STORAGE:

Recreation Information Management system (RIM).

REPORTS DUE:

Recreation Information Management RVD Report, annually.

DEVELOPED RECREATION SITES

COSTS:

\$10,000

RESPONSIBILITY:

Recreation Staff.

RESEARCH NEEDS:

None needed.

INVENTORY NEEDS:

None needed.

MONITORING TOPIC: Wilderness

The goal is to preserve and protect in perpetuity the primeval character and influence of the Wilderness by meeting the specific criteria for the resource, social and managerial conditions as identified through the Limits of Acceptable Change process.

THRESHOLD OF VARIABILITY:

When the minimum limits of acceptable change (LAC) for each Wilderness Resource Spectrum (WRS) class are maintained or a downward trend is not indicated, i.e., when LAC is *not* maintained or a downward trend *is* indicated, corrective action or further evaluation is necessary.

Change that is equal to or less than defined limits and indicators of units.

MONITORING QUESTIONS:

Are the Limits of Acceptable Change being met?

SUGGESTED METHOD/INFORMATION SOURCES:

Field review.

UNIT OF MEASURE:

The indicators identified through the Limits of Acceptable Change process.

MONITORING FREQUENCY:

Annually.

PRECISION AND RELIABILITY:

High.

DATA STORAGE:

Inventory plots, camera points and District 2300 files.

REPORTS DUE:

Annually at the end of the recreation use season a list of areas where limits of acceptable change indicators are being exceeded or moving towards being exceeded will be documented.

WILDERNESS

COSTS:

\$10,000

RESPONSIBILITY:

Recreation Staff.

RESEARCH NEEDS:

Research and develop a computerized method for managing campsite inventory data.

INVENTORY NEEDS:

Inventory and record LAC indicator data.

MONITORING TOPIC: Off-Road Vehicles (ORV)

The goal is to provide off-road vehicle opportunities to meet demand that will not cause considerable adverse effects on soil, water, fish, wildlife, cultural historic resources, and other trail users.

THRESHOLD OF VARIABILITY:

A significant number of recorded violations or conflicts on any trail where ORVs are not the primary management objective. A threshold evaluation will be made with every documented violation, user conflict incident, or incident of resource damage. Corrective action may result.

MONITORING QUESTION:

Are off-road vehicles causing or will cause considerable adverse effects on resources or other trail users on trails where ORVs are not the primary management objective?

SUGGESTED METHODS/INFORMATION SOURCES:

Field reviews, camera points, notices of violation, and written public comments.

UNIT OF MEASURE:

Number and severity of violations, use conflicts and/or resource damage.

MONITORING FREQUENCY:

Annually.

PRECISION AND RELIABILITY:

Moderate.

DATA STORAGE:

District and Supervisor's Office - 2300 files.

REPORTS DUE:

Three year intervals.

OFF-ROAD VEHICLES (ORV)

COSTS:

\$8,000

RESPONSIBILITY:

Recreation Staff and District Ranger.

RESEARCH NEEDS:

Research off-road vehicle (ORV) use in specific areas to determine if and how ORVs affect other visitors and resources.

INVENTORY NEEDS:

Inventory Limits of Acceptable Change indicators.

MONITORING TOPIC: Wild and Scenic Rivers

THRESHOLD OF VARIABILITY:

Identification of proposals or levels and types of uses that would result in the need to reclassify a designated river or segment to a lower classification or non-Wild and Scenic status.

Zero degradation of attributes needed to maintain classification integrity, i.e., any degradation of attributes will result in corrective action or further evaluation.

MONITORING QUESTION:

Are Wild and Scenic attributes of designated Wild and Scenic rivers or segments being maintained to meet the requirements of the Act?

SUGGESTED METHODS/INFORMATION SOURCES:

EA review of projects that might affect the river. On-site observation of levels and types of uses occurring.

UNIT OF MEASURE:

Wild and Scenic River classification criteria.

MONITORING FREQUENCY:

Each project proposed. Seasonal (minimum).

PRECISION AND RELIABILITY:

One hundred percent of all projects must be reviewed. Low intensity surveys are accepted.

DATA STORAGE:

District files with annual summary to S.O. files.

WILD AND SCENIC RIVERS

REPORTS DUE:

Each project EA. District - each report with annual summary to S.O.

COST:

\$500 per year for the three rivers proposed for Wild and Scenic designation in the Olympic National Forest Plan.

RESPONSIBILITY:

Quilcene Ranger District for project EA and field use surveys.

RESEARCH NEEDS:

Methods to sample use types and levels.

INVENTORY NEEDS:

Current levels of use by type.

MONITORING TOPIC: Cultural Resources

Cultural resources provide valuable links with the past. Discovery of these resources provides us with knowledge to manage and protect these irreplaceable resources.

THRESHOLD OF VARIABILITY:

Zero projects or cases without surveys and SHPO consultation, i.e., *any* projects or cases without surveys and SHPO consultation will result in corrective action or further evaluation.

MONITORING QUESTION:

Are cultural resource surveys being performed as required?

SUGGESTED METHOD/INFORMATION SOURCES:

Cultural resource reconnaissance, surveys and evaluations will be completed as described in the Region 6 "Cultural Resource Management Guidebook" for all project proposals and undertakings prior to implementing management decisions. Every ground disturbing project proposal or management activity that could impact cultural resources will be examined and documented with SHPO consultation as an integral part of the environmental analysis process.

UNIT OF MEASURE:

Numbers of projects and acres surveyed.

MONITORING FREQUENCY:

Forest officers authorized to approve NEPA documentation and compliance will certify that SHPO consultation is complete as part of approval processes. Annual accomplishment reports will also monitor survey and consultation processes.

PRECISION AND RELIABILITY:

High for both.

DATA STORAGE:

Case files, 2360. Site locations will be permanently documented in a "sensitive" subsystem of the Total Resource Information (TRI) system.

CULTURAL RESOURCES

REPORTS DUE:

Accomplishment reports will be prepared annually and kept in permanent records.

COST:

\$5,000

RESPONSIBILITY:

Forest Recreation Staff Officer.

RESEARCH NEEDS:

A formal survey design strategy needs to be completed.

INVENTORY NEEDS:

There is a need to complete a Forest-wide inventory of all cultural resources.

MONITORING TOPIC: Coordination with American Indians

THRESHOLD OF VARIABILITY:

No incidents of conflict between Forest policy and American Indian rights and/or other concerns; ongoing contact between Forest Leadership Team member and Tribal leaders within zone of influence, i.e., if contact is *not* ongoing and/or incidents of conflict *are* reported, corrective action or further evaluation is necessary.

MONITORING QUESTIONS:

Are Tribal representatives and/or Religious Leaders informed about Forest programs and activities especially how these may relate to interests and concerns about the American Indian Religious Freedom Act and negotiated Treaties?

SUGGESTED METHODS/INFORMATION SOURCES:

NEPA documentation of project coordination for activities that occur adjacent to Reservation boundaries. Meetings, interviews, and telephone contacts. Cooperative management of employment programs or mutually benefitting activities. Field visits and sharing of annual programs of work.

UNIT OF MEASURE:

Documentation of contacts.

MONITORING FREQUENCY:

Annually at Forest Leadership Meetings.

PRECISION AND RELIABILITY:

Moderate and high.

DATA STORAGE:

Include documentation in 2360 case files on Annual Action Plans for American Indian Programs.

REPORTS DUE:

Annually.

COORDINATION WITH AMERICAN INDIANS

COSTS:

\$5,000

RESPONSIBILITY:

Forest Leadership Team (FLT).

RESEARCH NEEDS:

None.

INVENTORY NEEDS:

None.

MONITORING TOPIC: Cultural and Historical Site Protection

THRESHOLD OF VARIABILITY:

No damage or loss to unevaluated or National Register eligible properties, i.e., *any* damage or loss will result in corrective action or further evaluation.

MONITORING QUESTIONS:

Are cultural resource properties (unevaluated or eligible for the National Register of Historic Places) being adequately protected from vandalism, natural degradation, etc.?

SUGGESTED METHODS/INFORMATION SOURCES:

Field visits and visual observation of all significant and unevaluated sites for changed conditions. Photograph and inventory conditions and document in casefile.

UNIT OF MEASURE:

Sites.

MONITORING FREQUENCY:

Annually.

PRECISION AND RELIABILITY:

High for both.

DATA STORAGE:

Record in specific site casefile.

REPORTS DUE:

In conjunction with annual accomplishment reports and PMOA with SHPO on Depression Era Activities.

CULTURAL AND HISTORICAL SITE PROTECTION

COSTS:

\$2,000

RESPONSIBILITY:

Recreation Staff Office.

RESEARCH NEEDS:

Better maintenance cost data for unevaluated or eligible structures.

INVENTORY NEEDS:

Evaluations need to be compiled.

MONITORING TOPIC: Cultural and Historic Site Rehabilitation

THRESHOLD OF VARIABILITY:

Inspections are not performed and/or criteria that give the site or structure value are damaged or lost.

MONITORING QUESTIONS:

Are complete, preventative inspections and commensurate stabilization, repair, or rehabilitation projects scheduled and performed for sites or structures eligible for inclusion in the National Register of Historic Places?

SUGGESTED METHODS/INFORMATION SOURCES:

Building maintenance and condition surveys and inspections using Secretary of Interior Standards and Guidelines for maintenance, repair, and rehabilitation of historic structures.

UNIT OF MEASURE

Compare conditions and proposed work to Secretary of Interior Guidelines for each structure.

MONITORING FREQUENCY:

In conjunction with schedules for building maintenance surveys, include annual visual inspection per significant sites.

PRECISION AND RELIABILITY:

High for both.

DATA STORAGE:

In general, building maintenance program files and 2360 case files for specific structure.

REPORTS DUE:

Annually.

COSTS:

\$4,000.

CULTURAL AND HISTORIC SITE REHABILITATION

RESPONSIBILITY:

Engineering and Recreation Staff.

RESEARCH NEEDS:

Special cost data and sources of supply for materials and building supplies that are historically authentic.

INVENTORY NEEDS:

Base-line data on authentic historic materials and methods that were used on specific structures.

MONITORING TOPIC: Wildlife Habitat

The Forest has seven indicator species that were selected to represent different habitats and give us information on the general condition of the Forest. They are the northern spotted owl, pileated woodpecker, marten, primary cavity excavators, Columbian black-tailed deer and Roosevelt elk. In addition, the bald eagle was also selected because of its Threatened and Endangered status and dependence on the riparian ecosystem.

THRESHOLD OF VARIABILITY:

- A. If occupancy of habitat areas by management indicator species deviate more than 20 percent from what is expected.
- B. If populations of management indicator species deviates more than 20 percent from what is expected.

MONITORING QUESTION:

- A. Are the management indicator species occupying the habitats as predicted?
- B. Are management indicator species populations within 20 percent of expected numbers at the end of each decade?

SUGGESTED METHODS/INFORMATION SOURCES:

- A.
 1. Northern spotted owl--field verification to determine if SOHAs are occupied and if occupied whether they contain singles, pairs, or breeding pairs of spotted owls.
 2. Pileated woodpecker and marten--field verification of habitat areas to determine if habitat areas are occupied.
 3. Primary Cavity Excavators--field review of timber sale project areas to determine if wildlife trees which are being left are being used by primary cavity excavators.
 4. Columbian black-tailed deer and Roosevelt elk--field review of deer and elk winter range, during the winter, to determine if elk and deer winter range was correctly identified and is being utilized by deer and elk.
 5. Bald eagle--field verification of known nesting during the months of March through July to determine nest activity and productivity.
- B.
 1. Northern spotted owl--field verification to determine the number of pairs of spotted owls occupying the spotted owl habitat network. This should be done using the standard protocols that the Forest Service uses for the Pacific Northwest Region.
 2. Pileated woodpecker and marten--field verification of pileated woodpecker and marten use of suitable habitat in areas unavailable for timber harvest.

WILDLIFE HABITAT

3. Primary Cavity Excavators--field review of timber sale project areas to determine the population level of primary cavity excavators using the sale area.
4. Columbian black-tailed deer and Roosevelt elk--coordination with the Washington Department of Wildlife to determine what deer and elk populations are on the Olympic National Forest.
5. Bald eagle--field verification of active nest sites to determine if breeding success is consistent with the Pacific Bald Eagle Recovery Plan.

UNITS OF MEASURE:

- A.
 1. Percent of SOHAs occupied.
Number of spotted owl pairs and singles utilizing SOHAs.
 2. Percent of pileated woodpecker and marten habitat areas that are occupied.
 3. Percent of recommended number of wildlife trees retained.
 4. Percent of identified winter range utilized by elk and deer during periods of heavy snow.
Acreage of winter range utilized by deer and elk that was not identified.
 5. Number of bald eagle nests that are active and the number that produce fledglings during any given year.
- B.
 1. Number of spotted owl pairs and singles using the spotted owl habitat network.
 2. Number of pileated woodpecker and marten pairs and singles utilizing C2 areas or other areas that are unavailable for timber harvest.
 3. Number of primary cavity excavators in sample areas by species.
 4. Number of elk and deer on the Olympic National Forest.
 5. Percent of active nest sites which produce fledglings.

MONITORING FREQUENCY:

- A.
 1. Annually for at least 80 percent of all SOHAs.
 2. Annually for at least 50 percent of all C2 areas.

3. Annually for at least 25 percent of all timber sales sold during the previous fiscal year.
 4. Annually for 10 percent of the herd areas identified.
 5. Annually for all BEMAs on the Olympic National Forest.
- B.
1. Annually for 80 percent of all SOHAs and 10 percent of all other areas in the spotted owl habitat network.
 2. Annually for 10 percent of all lands suitable for pileated woodpeckers and marten which are unavailable for timber harvest.
 3. Annually for at least 10 percent of all timber sales sold during the previous fiscal year.
 4. Annually for the entire Olympic National Forest.
 5. Annually for all BEMAs.

PRECISION AND RELIABILITY:

- A.
1. High precision and reliability.
 2. High precision and reliability.
 3. High precision and reliability.
 4. Moderate precision and reliability.
 5. High precision and reliability.
- B.
1. High precision and reliability.
 2. Moderate precision and reliability.
 3. Moderate precision and reliability.
 4. Moderate precision and reliability.
 5. High precision and reliability.

DATA STORAGE:

Oracle or FES database on the Data General computer system located in Olympia at the Supervisors Office of the Olympic National Forest.

REPORTS DUE:

- A. Annually.
- B. Every 5 years.

Possible reason for unfavorable reports might be:

- A. Natural catastrophes.
- B. Failure to implement standards in this Plan.

COSTS:

- A.
 - 1. \$120,000
 - 2. \$25,500
 - 3. \$15,000
 - 4. \$15,000
 - 5. \$7,500
- B.
 - 1. \$12,000
 - 2. \$21,000
 - 3. \$9,000
 - 4. \$2,000
 - 5. \$7,500

RESPONSIBILITY:

Forest Fish and Wildlife Program Manager.

RESEARCH NEEDS:

None. See old-growth monitoring topic.

INVENTORY NEEDS:

Wildlife habitat inventory of Forest to determine quality and quantity of habitat available.

MONITORING TOPIC: Fish Habitat

Demand for salmon and trout produced within the Forest is expected to increase. Public resource management agencies, commercial and sport fishing industries, Peninsula American Indians, and the general public all have a strong interest in the management of fisheries habitat.

The Forest selected anadromous trout and salmon, and resident trout groups as the biological indicators of the condition of on-Forest fisheries habitat. Monitoring these groups and the condition of their habitat should yield adequate information to detect and/or predict changes in habitat capability.

THRESHOLD OF VARIABILITY:

- A. If the Fish Habitat Capability deviates more than 10 percent of that expected.
- B. If the number of projects being implemented deviates more than 20 percent from what is listed in Appendix A.
- C. If Standards and Guidelines are not met by projects affecting habitat on more than 10 percent of the area during the decade.

MONITORING QUESTIONS:

- A. What are the cumulative effects of forest activities on fish habitat capability?
- B. Are fish habitat improvement projects being implemented as scheduled in the Forest Plan.
- C. Are fisheries related Standards and Guidelines being implemented and are they adequate?

SUGGESTED METHODS/INFORMATION SOURCES:

- A. Estimate the current fish habitat capability. This should include estimates of the previous year's habitat capability and the current year's habitat capability due to habitat improvement work. This will help determine if total fish production on the National Forest has been reduced due to the cumulative effects of forest activities on fish habitat. These estimates should be made on a drainage basis. One method to make these estimates would be to establish one permanent representative fish habitat monitoring reach, 100 meters in length, within each of the major Forest drainages. Determine fish habitat capability for each station based on: pool condition class; instream cover, large organic debris, and substrate composition; overhead canopy cover; spawning gravel quality (percent fines); macroinvertebrate community tolerance; and population estimates. Information source for measuring listed monitoring parameters is "Fisheries Habitat Evaluation Handbook," FSH 2609.23 (Monitoring), R-6 FSH 7/85 Amendment 1. Increases in habitat capability due to habitat improvement work should be based on the fish habitat enhancement package used in the Final Land and Resource Management Plan. If actual fish habitat capability is measured, this information should be used.

FISH HABITAT

- B. Field verification of fish habitat improvement projects accomplished.
- C. Field verification that S&Gs are being implemented. Comparison of fish habitat capability from year to year in order to determine adequacy of S&Gs.

UNIT OF MEASURE:

- A. Habitat capability measured as the total number of adult fish (by species) the habitat is capable for producing.
- B. Habitat improvement project constructed.
- C. Reports.

MONITORING FREQUENCY:

- A. Annually. A representative sample of drainages will be checked on an annual basis.
- B. Annually. A representative sample of fish projects will be checked on an annual basis.
- C. Annually. A representative sample of drainages will be checked on an annual basis.

PRECISION AND RELIABILITY:

- A. Precision and reliability of fish habitat capability indices is high. Precision and reliability of actual fish habitat capability is expected to be moderate.
- B. High precision and reliability.
- C. High precision and reliability.

DATA STORAGE:

Oracle or FES database on the Data General computer system located in Olympia at the Supervisor's Office of the Olympic National Forest.

REPORTS DUE:

- A. At the end of each calendar year for data collected during the previous fiscal year for all permanent monitoring stations measured.
- B. At the end of each calendar year for all projects monitored during the previous fiscal year.
- C. At the end of each calendar year for reviews conducted during the previous fiscal year.

Possible reasons for unfavorable reports include:

- A. Natural catastrophes.
- B. Failure to implement standards established in this Plan.
- C. Lack of funding.
- D. Inadequate escapement.
- E. Inaccurate models.

COSTS:

- A. \$140,000 (\$0)
- B. \$64,000 (\$4,000)
- C. \$20,000 (\$5,000)

RESPONSIBILITY:

Forest Fisheries Program Manager

RESEARCH NEEDS:

Development of a model that predicts the effects of habitat manipulation on fish habitat capability.

INVENTORY NEEDS:

Inventory of Forest fish habitat to determine quality and quantity.

MONITORING TOPIC: Water Quality

Watersheds on the Forest are managed to maintain water quality. Water quality for domestic use is important to people dependent on water from the Forest. It is also important to the maintenance of fish habitat, both on-Forest and downstream. Water quality is influenced primarily by sediment entering the streams and, to a lesser extent, by increased water temperature. Management activities, such as road building and timber harvest, can affect water quality.

THRESHOLD OF VARIABILITY:

- A. Standards and Guidelines are not met by five percent or more of projects affecting water quality.
- B. Zero deviation of water quality standards is permitted.
- C. The number of projects being implemented deviates more than 20 percent from what is listed in Appendix A for soil and water projects.

MONITORING QUESTIONS:

- A. Are water resource-related BMPs and S&Gs being implemented?
- B. Are water resource-related BMPs and S&Gs effective to maintain or enhance beneficial uses of water and assure that water quality parameters are within limits established by State and Federal water quality standards?
- C. Are watershed improvement projects being accomplished as scheduled?

SUGGESTED METHODS/INFORMATION SOURCES:

- A. Interdisciplinary EA and project implementation review.
- B. Quantitative measurement of physical and chemical water quality parameters. Automatic sampling devices should be used for turbidity samples. Grab samples should be used for water chemistry samples. Visual monitoring should be used to assess ground conditions after management activities occur.
- C. Attainment reports.

UNITS OF MEASURE:

- A. Project review report.
- B. Turbidity (NTU) and water chemistry (mg/l). Field evaluation of projects.
- C. Soil and water projects constructed.

MONITORING FREQUENCY:

- A. Annual.
- B. Daily/periodic.
- C. Annual.

PRECISION/RELIABILITY:

- A. Moderate/high.
- B. Moderate/high.
- C. High/high

DATA STORAGE:

- A. Watershed files.
- B. Watershed files.
- C. Watershed files.

REPORTS DUE:

- A. Annually.
- B. Annually.
- C. Annually.

COSTS:

- A. \$8,000.
- B. \$36,000.
- C. \$1,000

RESPONSIBILITY:

- A. Forest/District Hydrologist.

WATER QUALITY

- B. Forest/District Hydrologist.
- C. Watershed Staff Officer.

RESEARCH NEEDS:

Water quality standards should be established for silvicultural activities which take into account: natural variability of water quality parameters of forest streams and beneficial uses of the streams.

INVENTORY NEEDS:

There is a need to quantify existing water quality in major watersheds. Parameters such as sediment and water temperature should be determined upstream from the National Forest boundary, and immediately downstream from the last point of potential effect from National Forest activity.

MONITORING TOPIC: Watershed Cumulative Effects

Goals for cumulative effects analysis are: to determine if there is a significant potential of downstream cumulative effects occurring both on and off-Forest, and to assess whether water resource values are being maintained or enhanced. Individual management activities within a drainage should have significant effect on downstream beneficial uses. However, when management activities in a drainage are collectively assessed in a cumulative effects analysis, there can be significant effects on downstream beneficial uses. The intensity and type of activities plus slope stability are important factors in determining the magnitude of impacts to water resource values.

THRESHOLD OF VARIABILITY:

- A. Greater deviation in coefficients (greater than 30 to 40 percent) than desirable.
- B. Greater deviation from predicted effects (greater than 30 to 40 percent) than desirable.

MONITORING QUESTIONS:

- A. Are the coefficients used in the cumulative effects analysis valid?
- B. Are the cumulative effects within the range predicted in the FEIS?

SUGGESTED METHODS/INFORMATION SOURCES:

- A. Sediment data should be collected at selected sites where management activities or projects are occurring.
- B. Cumulative effects monitoring data will be evaluated and summarized to determine whether effects are within the range predicted. Activities will be modified if necessary to meet S&Gs. The following techniques should be used: stream surveys (Hankin-Reeves), landslide inventory by use of aerial photographs and field verification, and sediment data from rivers at U.S. Geological Survey stream gauging stations.

UNITS OF MEASURE:

- A. Volume (tons per day or year).
- B. Stream reach (miles), area (acres) and volume (cubic yards per year), and volume (tons per year).

MONITORING FREQUENCY:

- A. Daily.
- B. Every five years, yearly (first year and every four years or when new aerial photographs are available), and continuous.

PRECISION/RELIABILITY:

- A. Moderate/moderate to high.
- B. Moderate/moderate to high.

DATA STORAGE:

- A. Watershed files.
- B. Watershed files.

REPORTS DUE:

- A. Yearly.
- B. Yearly (first year and four to eight years thereafter, yearly, yearly).

COSTS:

- A. Initial: \$25,000; operating: \$36,000.
- B. Initial: \$17,000; operating: \$40,000.

RESPONSIBILITY:

- A. Ranger District hydrologist or soil scientist.
- B. Forest and Ranger District resource specialists (hydrologist, geologist, and fisheries biologist).

RESEARCH NEEDS:

The sediment model which was used to make predictions in the Forest Planning process needs to be verified. A defensible cumulative effects model should be developed in conjunction with establishing a threshold of concern for increased sediment levels.

INVENTORY NEEDS:

Slope stability and sediment data bases need to be developed so that cumulative effects can adequately be modeled. The data should be collected for a long enough time period to account for natural variations from year to year.

MONITORING TOPIC: Riparian Areas

Riparian areas are critical to many forest resource values. Riparian vegetation, particularly large trees, is an important component of fish habitat that provides a continued source of large woody debris creating rearing habitat. Riparian areas also play an important role in wildlife habitat. Maintaining stability of riparian areas helps to minimize sedimentation in streams. Riparian areas are heavily used by recreationists and are often associated with gentle slopes conducive to easy road construction. Timber harvesting concerns frequently arise because riparian areas generally support high value timber stands.

THRESHOLD OF VARIABILITY:

Standards and Guidelines are not met by ten percent or more of projects affecting riparian areas.

MONITORING QUESTION:

Are riparian areas Standards and Guidelines being implemented and are they adequate?

SUGGESTED METHODS/INFORMATION SOURCES:

Field Observation: Postactivity review of selected practices by ID Team. Examples: (1) streambank condition survey, (2) photo point documentation, (3) vegetative condition survey.

UNIT OF MEASURE:

Project review reports.

MONITORING FREQUENCY:

Annually (10 reviews for the Forest)

PRECISION AND RELIABILITY:

Moderate for both.

DATA STORAGE:

Watershed files (2520)

RIPARIAN AREAS

REPORTS DUE:

End of year.

Possible causes for unfavorable reports might be:

- A. Standards established in this Plan are not being implemented.
- B. Standards are being implemented but are not effective.
- C. Inappropriate scheduling of projects or activities.

COSTS:

\$12,000 (\$8,000)

RESPONSIBILITY:

Forest Watershed Staff Officer.

RESEARCH NEEDS:

None.

INVENTORY NEEDS:

Identification of changes in vegetation within riparian areas. We need the first inventory to determine current conditions and a means of automating annual updates.

MONITORING TOPIC: Soil Productivity

Soil is one of the basic resources on the Forest. Maintaining soil productivity is important in reaching resource goals. Erosion and mass failure of soils as a result of management activities can increase sedimentation of stream courses. Soil compaction can result in slower vegetative growth rates.

THRESHOLD OF VARIABILITY:

Compacted, severely burned, or actively failing areas occupy less than 20 percent of an area after management activities occurred, i.e., if greater than 20 percent, corrective action or further evaluation is necessary.

MONITORING QUESTIONS:

Following management activities, is less than 20 percent of the land area compacted, severely burned, or actively failing?

SUGGESTED METHOD/INFORMATION SOURCES:

Visual evaluations by soil scientists and quantitative sampling using procedures in "Guidelines for Sampling Some Physical conditions of Surface Soils" (see FSM 2520 R6 Supp. 50), or other appropriate techniques.

UNIT OF MEASURE:

Percent of project area impacted.

MONITORING FREQUENCY:

Visual observations by Soil Scientists at least one project annually per District. Quantitative sampling at least one Forest project every two years.

PRECISION AND RELIABILITY:

Moderate for both.

DATA STORAGE:

Watershed files (2520)

SOIL PRODUCTIVITY

REPORTS DUE:

Annually.

COSTS:

\$10,000 (\$0)

RESPONSIBILITY:

Forest Watershed Staff Officer

RESEARCH NEEDS:

Establish relationships between soil compaction, slash burning, and removal of surface soil ("A" Horizon) to Forest productivity and recovery rates through time.

INVENTORY NEEDS:

Keep a current inventory of all mass wasting and soil erosion areas that are greater than 0.5 acres.

MONITORING TOPIC: Air Quality

THRESHOLD OF VARIABILITY:

No incidents that do not meet quality standards for Class I and urban air quality control areas, i.e., if *any* incidents are reported, corrective action or further evaluation is necessary.

MONITORING QUESTIONS:

- A. What is the effect of the Olympic National Forest prescribed fire program on Class I and urban area air quality?
- B. How effective is the State SIP smoke management program?

SUGGESTED METHODS/INFORMATION SOURCES:

- A. Forest Service records on prescribed fire fuel consumption and TSP production.
- B. Observation of smoke plume behavior.
- C. Reports of smoke intrusion into Class I and urban avoidance areas.

UNIT OF MEASURE:

- A. Fuel consumption/TSP production by each program site.
- B. On-site observation of smoke plume behavior.
- C. Each intrusion incident.

MONITORING FREQUENCY:

- A. Each project site during active combustion phase.
- B. Each project site during active combustion phase.
- C. Each incident.

PRECISION AND RELIABILITY:

- A. Moderate precision and reliability.
- B. Moderate precision and reliability.
- C. High reliability of verification.

DATA STORAGE:

- A. District and S.O. files.
- B. District and S.O. files.
- C. S.O. and cooperating agency files (DOE, DNR, ONP).

REPORTS DUE:

- A. Each project site with annual summary.
- B. Each project site with annual summary.
- C. Each incident and annual summary.

COSTS:

Estimated Olympic National Forest annual program cost: \$3,600.

RESPONSIBILITY:

R.O. and S.O. Fuels Management personnel.

RESEARCH NEEDS:

Smoke dispersion and effects.

Fuels consumption/TSP outputs.

INVENTORY NEEDS:

Baseline air quality data for Class I and urban areas - Visibility criteria and TSP criteria.

MONITORING TOPIC: Economic Considerations - Costs and Values

Activity costs and output values used in FORPLAN analyses played a key role in establishing the land allocations and activities prescribed in this Forest Plan. Substantial changes in the economic variables used in the development of this Forest Plan could affect the appropriateness of the allocations and activities it contains.

THRESHOLD OF VARIABILITY:

Current cost and value information should be regularly compared with the costs and values used in Forest Plan development. When differences become sufficient to warrant reassessment of allocations and activities, the Forest Plan FORPLAN formulation should be rerun using updated economic data. The point at which such an action becomes necessary is difficult to define, due to the complexity of the cost and value relationships involved. Changes of 25 percent or less in experienced and traditional costs and values are permitted deviations, before assessment by Forest Officers is required.

MONITORING QUESTION:

Are the allocations and activities prescribed in this Forest Plan still the most cost-efficient means of meeting Plan objectives?

SUGGESTED METHODS/INFORMATION SOURCES:

It will be necessary to update cost and value data on a regular basis. The costs and values having the greatest effect on PNV calculations are as follows:

Costs: Timber management and silvicultural activity costs.

Road-related costs (construction, reconstruction, engineering).

Logging and other timber purchaser costs.

Fish and wildlife habitat mitigation and enhancement projects.

Recreation management costs.

Values: Measures of timber value (appraised stumpage, bid rates, mill values).

Dockside value of commercial fish catch.

Value of recreation outputs (RVDs and WFUDs).

There are several potential sources of cost and value information. Most of the necessary cost data can be taken from experienced costs on-Forest, although periodically revised Regional cost estimates will be needed to

ECONOMIC CONSIDERATIONS - COSTS AND VALUES

track logging costs. Timber value estimates are available in a variety of forms: current appraised stumpage rates and bid rates, Olympic Peninsula mill value estimates developed by the Washington State Department of Natural Resources, and Regional estimates. The "cut value" timber pricing technique (see FEIS, Appendix B) used in developing this Forest Plan is recommended. Commercial fish and recreation value revisions will occur as RPA and Regional value estimates are updated.

UNIT OF MEASURE:

Dollars per unit of output or activity. Adjustment of all dollar values to a uniform base year will be necessary.

MONITORING FREQUENCY:

Costs and values should be updated annually. FORPLAN allocations should be tested as needed, but at least once every five years.

PRECISION AND RELIABILITY:

Expected to be high for cost information and moderate for value information.

DATA STORAGE:

Forest files (1970).

REPORTS DUE:

Annual reports for changes in costs and values. Results of FORPLAN analyses should be reported whenever such testing occurs.

COST:

\$1,150 (\$750). Includes \$1,000 per year for data gathering and updating, \$1,500 per decade in FORPLAN costs (estimated frequency of analysis: three per decade).

RESPONSIBILITY:

Forest Administrative Officer for costs and values.
Forest Analyst for FORPLAN.

RESEARCH NEEDS:

None

INVENTORY NEEDS:

None

BUDGETS

MONITORING TOPIC: Budgets

THRESHOLD OF VARIABILITY:

Funds that deviate more than 25 percent from previous budget levels.

MONITORING QUESTIONS:

Are annual programs and budgets projected in the Forest Plan being realized?

SUGGESTED METHODS/INFORMATION SOURCES:

Monitor budgets and programs of work in relationship to need and projections in Forest Plan; evaluate trends. More timely adjustments, especially in context with remaining years in the Plan period.

UNIT OF MEASURE:

Dollars

MONITORING FREQUENCY:

Annually.

PRECISION AND RELIABILITY:

High/high.

DATA STORAGE:

Forest Planning records.

REPORTS DUE:

Every year.

COSTS:

\$1,000

RESPONSIBILITY:

Planning Staff and FLT.

RESEARCH NEEDS:

None.

INVENTORY NEEDS:

None.

MONITORING TOPIC: Social and Economic Effects

THRESHOLD OF VARIABILITY:

- A. Changes in payments to counties and U.S. Treasury less than plus or minus 20 percent.
- B. Unemployment in counties less than 12 percent.
- C. Changes in local income level less than plus or minus 20 percent.
- D. New housing starts vary plus or minus 35 percent from traditional market.
- E. No significant changes in lifestyles, environmental parameters, community values.

MONITORING QUESTIONS:

Are effects of Forest Plan implementation consistent with expectations? Should Forest Planning objectives change to meet changing socioeconomic conditions?

SUGGESTED METHODS/INFORMATION SOURCES:

Forest Plan, especially Chapter V, "Monitoring"; Washington State Department of Commerce and Economic Development; Washington State Department of Employment Security; Status of Timber Receipts to Counties Summaries; Periodical Reports of Economic Indicators; and other sources as appropriate.

UNIT OF MEASURE:

Numerous.

MONITORING FREQUENCY:

Annually.

PRECISION AND RELIABILITY:

High/high.

DATA STORAGE:

Forest Plan records.

REPORTS DUE:

Annually.

COSTS:

\$1,000

RESPONSIBILITY:

Planning Staff and Administrative Officer.

RESEARCH NEEDS:

Forest Economist position.

INVENTORY NEEDS:

Better methodology to interface with Federal and State agencies involved in socioeconomic problems/management.

MONITORING TOPIC: Standards and Guidelines - General

THRESHOLD OF VARIABILITY:

No results or attained standards that are less than existing Standards and Guidelines, i.e., any deviation from Standards and Guidelines or failure to meet goals and objectives will result in corrective action or further evaluation.

MONITORING QUESTIONS:

Are Forest Plan Standards and Guidelines being implemented, and do they meet stated goals and objectives?

SUGGESTED METHODS/INFORMATION SOURCES:

Some Standards and Guidelines will routinely be monitored as part of scheduled and programmed activities such as review of mineral operation plans, etc. Review is needed for selected activities that may not otherwise be monitored.

UNIT OF MEASURE:

Program element or special management unit Standard and Guideline.

MONITORING FREQUENCY:

Once every two years.

PRECISION AND RELIABILITY:

High/high.

DATA STORAGE:

Forest Plan records.

REPORTS DUE:

Every two years.

MONITORING TOPIC: Standards and Guidelines - General

THRESHOLD OF VARIABILITY:

No results or attained standards that are less than existing Standards and Guidelines, i.e., *any* deviation from Standards and Guidelines or failure to meet goals and objectives will result in corrective action or further evaluation.

MONITORING QUESTIONS:

Are Forest Plan Standards and Guidelines being implemented, and do they meet stated goals and objectives?

SUGGESTED METHODS/INFORMATION SOURCES:

Some Standards and Guidelines will routinely be monitored as part of scheduled and programmed activities such as review of mineral operation plans, etc. Review is needed for selected activities that may not otherwise be monitored.

UNIT OF MEASURE:

Program element or special management unit Standard and Guideline.

MONITORING FREQUENCY:

Once every two years.

PRECISION AND RELIABILITY:

High/high.

DATA STORAGE:

Forest Plan records.

REPORTS DUE:

Every two years.

MONITORING TOPIC: Project Environmental Analysis Documentation

All proposed projects on the Olympic National Forest must be accompanied by the appropriate level of environmental analysis and subsequent documentation.

THRESHOLD OF VARIABILITY:

Zero cases without NEPA documentation, i.e., any cases without NEPA documentation will result in corrective action or further evaluation.

MONITORING QUESTION:

Are proposed activities in compliance with NEPA procedures?
Were projects implemented as stated in NEPA documentation?

SUGGESTED METHOD/INFORMATION SOURCES:

Review environmental documents before records of decision are signed, and make periodic field reviews with completed NEPA documents.

UNIT OF MEASURE:

Reports reviewed.

MONITORING FREQUENCY:

All documents are submitted for review. Activity Reviews will include review of attendant NEPA documentation to see if projects were implemented as planned.

PRECISION AND RELIABILITY:

High for both.

DATA STORAGE:

Supervisor's Office files (1950), for all projects where the deciding officer is the Forest Supervisor or higher authority. Ranger District files (1950) for all other projects.

REPORTS DUE:

A recommendation for approval by the deciding officer is considered as the report.

Probable causes for an unfavorable report might be:

- A. Inadequate designation of management area boundaries.
- B. Inappropriate project proposals.
- C. Failure to implement projects as described in the project environmental documentation.

COST:

\$10,000 (\$10,000)

RESPONSIBILITY:

The Forest EA Coordinator shall be responsible for projects approved by the Forest Supervisor or higher authority. The District Ranger shall be responsible for all other projects.

RESEARCH NEEDS:

None.

INVENTORY NEEDS:

None.

MONITORING TOPIC: Road Mileage

THRESHOLD OF VARIABILITY:

Fifteen percent of road miles constructed fail to meet Forest Plan special management unit or area resource management objectives.

MONITORING QUESTIONS:

Does the transportation system serve the Management Area Resource objectives within Forest Plan projections?

SUGGESTED METHODS/INFORMATION SOURCES:

Conduct an annual interdisciplinary review of road management objectives for the road system serving the review area.

UNIT OF MEASURE:

Miles of road.

MONITORING FREQUENCY:

Every year.

PRECISION AND RELIABILITY:

Moderate/Moderate.

DATA STORAGE:

Forest Plan records and TSPIRS, STARS, GIS and TIS.

REPORTS DUE:

Every two years.

COSTS:

\$5,000.

RESPONSIBILITY:

Forest Engineer.

RESEARCH NEEDS:

None.

INVENTORY NEEDS:

Need to review and update TIS data through completion of Access and Travel Management Plan.

MONITORING TOPIC: Minerals Development and Rehabilitation

THRESHOLD OF VARIABILITY:

Zero cases not implemented as planned.

MONITORING QUESTIONS:

Are the Standards and Guidelines for mineral operations reasonable and effective?

SUGGESTED METHODS/INFORMATION SOURCES:

Review and evaluate 20 percent of all current mineral activities on the Forest during every scheduled activity review. Review and document results of all locatable or leasable operating plans against actual operating results.

UNIT OF MEASURE:

Minerals cases.

MONITORING FREQUENCY:

During activity reviews and post reviews of all locatable or leasable operations.

PRECISION AND RELIABILITY:

Moderate/Moderate.

DATA STORAGE:

In 2,800 case files.

REPORTS DUE:

Activity reviews as scheduled or post operations inspections.

COSTS:

\$500

RESPONSIBILITY:

Lands and Minerals Staff

RESEARCH NEEDS:

None.

INVENTORY NEEDS:

None.

MONITORING TOPIC: Insect and Disease Control

THRESHOLD OF VARIABILITY:

- A. If frequency of infection areas (insect or disease) increases by more than 100 percent in any biannual period. Threshold is 100 percent.
- B. If areas of infection of root disease is less than 10 percent by areas of a stand or the frequency is more than two infection centers per acre.

MONITORING QUESTIONS:

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

SUGGESTED METHODS/INFORMATION SOURCES:

- A. Bi-annual serial survey by Regional/State specialists.
- B. Stand exams performed for all proposed vegetation manipulation projects.
- C. Intensive disease surveys by qualified personnel when either A or B indicates more than five percent of a stand has infections.

UNIT OF MEASURE:

- A. Frequency of disease centers - number per acre and change over time.
- B. Area of infection - acres.

MONITORING FREQUENCY:

- A. Bi-annual aerial flights.
- B. Stand exams should be performed within two years prior to treatment. Latest data should be summarized every two years to coincide with aerial flight information.

PRECISION AND RELIABILITY:

- A. Reliability of aerial flights is moderate for determination of mortality and identification of pest.
- B. Stand Exams produce high reliability for mistletoe infections, moderate for root diseases.
- C. Intensive surveys are high in reliability and precision.

DATA STORAGE:

- A. Aerial survey maps maintained on hard copy maps at District. Electronic version at Regional Office with potential for Forest and District GIS.
- B. Exam data to be stored in Regional Stand Exam Base, Forest/District TRI and GIS/ Root disease locations should be placed on a permanent map layer.

REPORTS DUE:

Bi-annually.

COSTS:

- A. \$1,000 for aerial surveys.
- B. \$.75 per acre for training and time spent on disease evaluations.
- C. \$3.00 per acre for Intensive Examinations.

RESPONSIBILITY:

- A. FPM - Regional Office for aerial flight surveys.
- B. Forest Silviculturist for all other.

RESEARCH NEEDS:

None.

INVENTORY NEEDS:

None beyond required surveys unless threshold of variability is exceeded or catastrophic damage occurs (wind throw or fire).

MONITORING TOPIC: Timber Offered

The amount of timber harvested is a major issue with most people interested in the management of the Forest. The ASQ in this plan was developed to provide the wood needed to supply local industry and maintain local economies and lifestyles while maintaining quality and quantity of fish and wildlife habitat, scenic and recreation opportunities.

THRESHOLD OF VARIABILITY:

Deviation of 15 percent from scheduled amount.

MONITORING QUESTIONS:

Is the Forest offering the cubic foot volume of chargeable timber established by the Plan ASQ?

Is the Forest offering the cubic foot volume of nonchargeable timber necessary to achieve the estimated TSPQ?

SUGGESTED METHODS/INFORMATION SOURCES:

Utilize STARS, TSSA and TRACS to maintain records of planned sell and harvested volumes.

UNIT OF MEASURE:

Control is on MMBF based on conversions from MMBF.

MONITORING FREQUENCY:

Annual.

PRECISION AND RELIABILITY:

Sell based on MMBF is high. Precision is moderate for conversion to CF.

DATA STORAGE:

TRI, GIS, TMIS, STARS

REPORT DUE:

Annually.

COSTS:

\$1,500

RESPONSIBILITY:

Timber Staff.

RESEARCH NEEDS:

Cubic Foot Cruise volume determinations.

INVENTORY NEEDS:

Standing volume inventory, plant association models, permanent growth plots.

MONITORING TOPIC: Silvicultural Practices

Maintaining non-declining flow and sustained yield of timber requires maintenance of stand growth at the levels predicted in the plan and will require attainment of the prescribed intensive silvicultural practices. Successful attainment consists of the prescribed treatment applied at the prescribed stand age.

THRESHOLD OF VARIABILITY:

- A. Average regeneration period less than 3.5 years, i.e., if the average exceeds 3.5 years corrective action or further evaluation is necessary.
- B. Fifteen percent of stands exceed recommended stocking by more than 25 percent at prescribed ages.
- C. Twenty percent variation from prescribed levels of fertilization is permitted.
- D. Less than 75 percent of prescribed stocking of Douglas-fir trees are seed produced at Dennie Ahl Orchard block 09012.
- E. Units do not exceed 60 acres without Regional Forest approval, and Standards and Guidelines are met for variety, dispersal openings and vegetative stages.
- F. Harvest methods are commensurate with Plan objectives in all cases, i.e., methods not commensurate will require corrective action or further evaluation.

MONITORING QUESTIONS:

- A. Are stands adequately restocked within three years?
- B. Is early stocking control (precommercial thinning) completed according to silvicultural prescriptions?
- C. Is fertilization completed on Douglas-fir stands as prescribed?
- D. Is genetic stock utilized for reforestation in the appropriate genetic zone/plant association/moisture zone?
- E. Are created openings (clear cuts) within size/distribution limits, and are objectives for variety, dispersal openings and vegetative stages met?
- F. Are harvest methods commensurate with Forest Plan objectives?

SUGGESTED METHODS/INFORMATION SOURCES:

- A. Utilize TRI, GIS and plantation survey records to determine year of harvest and year of origin of new stand at time of establishment survey.

- B. Maintain prescription data base for stocking control "needs". Compare prescribed stems per acre and stand age for prescribed treatment with actual accomplishment.
- C. Utilize TRI, GIS, Stand Data Base and "needs" prescription file.
- D. Utilize TRI, GIS and third year stocking/certification exam. All certification exams should contain statement on seed source of projected crop trees.
- E. Use TRI, GIS and STARS to summarize unit/opening sizes.
- F. Track acres by harvest methods utilizing TRACS.

UNIT OF MEASURE:

- A. Year stand origin - year cut/acres.
- B. Stand age in years/acres.
- C. Acres
- D. Trees per acre - acres
- E. Acres per opening.

MONITORING FREQUENCY:

- A. through E. - Annually.

PRECISION AND RELIABILITY:

- A. High.
- B. High.
- C. High.
- D. Medium
- E. High.

DATA STORAGE:

- A. through E. - TRI, GIS, STARS, Stand Exam Data and Prescription files.

REPORTS DUE:

SILVICULTURAL PRACTICES

- A. Three years.
- B. and C. - Annually.
- D. and E. - Three years.

COSTS:

- A. \$1,200
- B. \$600
- C. \$200
- D. \$600
- E. \$400

RESPONSIBILITY:

- A. through E. - Timber Staff

RESEARCH NEEDS:

- A. Stocking guides for mixed species stands.
- B. Fertilization response for mixed species stands other than Douglas -fir general. Yield response models for various silvicultural practices.

MONITORING TOPIC: Lands Suitable for Timber Management

Forested lands determined as unsuitable for timber production will be reviewed to see if the unsuitability determination might have changed. Forest land may be "unsuitable" because of regeneration problems or due to potential resource damage if harvest is conducted. Current estimates of unsuitability are based on best available extrapolation of conditions based on plant associations and soil types. All areas of forested lands need site specific verification of suitability determination.

THRESHOLD OF VARIABILITY:

Five percent net variation in "Suitable" acres.

MONITORING QUESTIONS:

Are lands which are identified as not suitable for timber production still unsuitable? (And, are lands which were identified as suitable for timber production still suitable?)

SUGGESTED METHODS/INFORMATION SOURCES:

The Forest Land Management Plan GIS layer for suitability should provide the base area/acres for timber suitability. Districts should review suitability within each IRAA as an integral part of IRAA analysis for proposed timber sales. Boundaries between suitable/unsuitable should be determined on the ground.

UNIT OF MEASURE:

Acres.

MONITORING FREQUENCY:

On going as each IRAA analysis is done. Summary report should be completed each five years.

PRECISION AND RELIABILITY:

Medium - Reliability should increase as experience is gained.

DATA STORAGE:

TRI, GIS map layer.

REPORTS DUE:

Five year intervals.

COSTS:

\$2,000

RESPONSIBILITY:

Timber Staff.

RESEARCH NEEDS:

Plant association modeling/soils/suitability correlation

INVENTORY NEEDS:

Plant association mapping.

MONITORING TOPIC: Old-Growth

Old-growth forests are extremely valuable both aesthetically and economically. They provide essential habitat for over 50 species of wildlife and are important (especially western redcedar) to American Indians.

THRESHOLD OF VARIABILITY:

Acreage meeting the definition of old-growth, as identified in Forest Plan, varies no more than 10 percent of expectations.

MONITORING QUESTIONS:

- A. Are acres of old-growth adequate to maintain populations of old-growth dependent species?
- B. Are acres of old-growth consistent with projected Forest Plan levels?

SUGGESTED METHODS/INFORMATION SOURCES:

- A. Using TRI and field observations, determine whether old-growth allocations are being retained as specified in the Plan.
- B. Using TRI data base, calculate the difference between projected levels and field data.

UNIT OF MEASURE:

Acres

MONITORING FREQUENCY:

- A. Yearly.
- B. Yearly, for the first five years. At five-year intervals thereafter.

PRECISION AND RELIABILITY:

High for both.

DATA STORAGE:

Wildlife files (2600).

REPORTS DUE:

Annually

Probable causes for unfavorable reports are:

- A. Inaccurate beginning inventory.
- B. Failure to follow standards established in this Plan.
- C. Inaccurate data for empirical timber yield tables.

COSTS:

- A. \$2,500 (\$0)
- B. \$2,500 (\$0)

RESPONSIBILITY:

Forest Wildlife Staff Officer.

RESEARCH NEEDS:

Determination of home range of indicator species to determine adequacy of remaining old-growth acres.

INVENTORY NEEDS:

None

MONITORING TOPIC: Native Plants

The protection of species and communities of native plants has emerged as a key issue on the Forest. Impacts to these plants from management activities and from introduced plant and animal species is of primary concern.

THRESHOLD OF VARIABILITY:

Condition and number of sensitive, rare, threatened, endangered, or unusual plant species and communities shows declining trend.

MONITORING QUESTIONS:

- A. Are management activities such as timber harvest and road building negatively impacting native plant species and communities?
- B. Are introduced plant and animal species negatively impacting native plant species and communities?

SUGGESTED METHODS/INFORMATION SOURCES:

- A. Using field observations, determine current condition and trends of native plants, particularly those of concern for their unusual characteristics or rarity.
- B. Using plot data, examine the effects of introduced species on native plant numbers and condition.

UNIT OF MEASURE:

Number of located plants. Conditions of plants and plant communities over time.

MONITORING FREQUENCY:

Yearly.

PRECISION AND RELIABILITY:

Moderate for both, but dependent on level of personnel and funding.

DATA STORAGE:

Resource files

REPORTS DUE:

Annually

Probable causes for unfavorable reports are:

- A. Management activities not following direction of Plan standards and guidelines.
- B. Introduced species of plants or animals having negative impacts on native plant species or communities.
- C. Insufficient or improperly designed data gathering.

COSTS:

\$10,000

RESPONSIBILITY:

Forest Resources Staff Officer and Forest Botanist

RESEARCH NEEDS:

Determination of effects of introduced species such as mountain goats on native plant species and communities.

INVENTORY NEEDS:

Location and numbers of sensitive, threatened, or unusual plant species and communities.