



United States
Department of
Agriculture

Forest Service

Pacific
Northwest
Region



1993



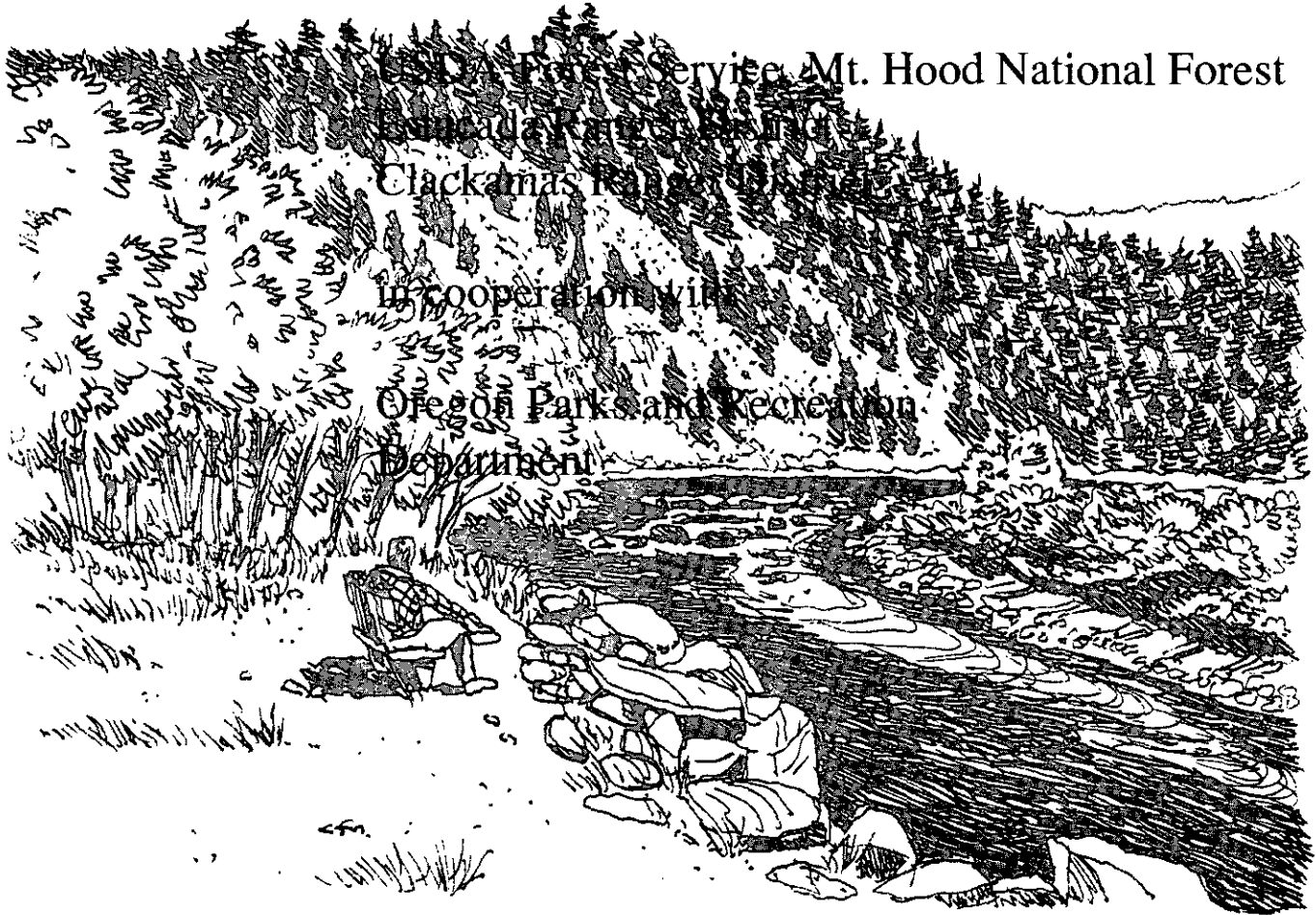
Clackamas National Wild and Scenic River and State Scenic Waterway

Environmental Assessment and Management Plan

United States Forest Service, Mt. Hood National Forest

Clackamas National Wild and Scenic River
and State Scenic Waterway

In cooperation with
Oregon Parks and Recreation
Department



Printed on recycled paper

Clackamas National Wild and Scenic River and State Scenic Waterway

Environmental Assessment and Management Plan

Deciding Official:

**Michael S. Edrington, Forest Supervisor
Mt. Hood National Forest
2955 N.W. Division
Gresham, OR 97030**

For Further Information:

**Janet Anderson-Tyler
Estacada Ranger District
595 N.W. Industrial Way
Estacada, OR 97023
(503) 630-6861**

**Paul Norman
Mt. Hood National Forest Supervisors Office
(503) 666-0700**

Table of Contents

Preface

Chapter 1 Purpose and Need

Introduction	1
Legislative Background	1
<i>Planning Mandate</i>	2
Planning Process	4
Issues and Outstandingly Remarkable Values	5
Existing Plans, Policies and Agreements	7

Chapter 2 Affected Environment

Introduction	15
River Overview	15
A Visit to the Clackamas	18
Hydrology and Water Quality	20
Fisheries	23
Recreation and Public Use	29
Current Visitor Use Facilities, Services, and Settings	29
Recreation Settings	31
Public Use	32
Carrying Capacity	32
Wildlife	37
Threatened, Endangered and Sensitive Species Overview	38
Riparian Obligates	39
Habitat Conditions	40
Botany and Ecology	41
Cultural Resources	42
Scenic Resources	43
Geology	44
Access and Travel Management	46

Timber	48
Socioeconomics	49
Air Quality	51
Fire Management	51
Fire Protection	51
Military Operations	51

Chapter 3 Alternatives

Summary of Alternatives and Desired Future Condition	52
--	----

Chapter 4 Environmental Effects

Introduction	68
Hydrology and Water Quality	68
Fisheries	72
Recreation and Public Use	75
Wildlife	78
Botany and Ecology	81
Cultural Resources	82
Scenic Resources	82
Geology	85
Access and Travel Management	85
Timber	87
Socioeconomics	87
Other	89

Chapter 5 Consultation With Others

Forest Service Interdisciplinary team	94
List of Agencies, Organizations and Individuals Consulted	95
Summary of Public Involvement	96

List of Maps

Map 1.1 Vicinity Map Clackamas River	Preface
Map 2.1 Clackamas River Corridor -- Current (interim) River Boundary	16
Map 3.1 Clackamas River Corridor -- Proposed River Boundary	66

List of Figures

Figure 1.1 Summary of River Planning Process	4
--	---

List of Tables

Table 1.1 Summary of Public Issues	6
Table 1.2 1991 Determination of Clackamas River Biological Potential, 1991 Escapement Over North Fork Dam, and ODFW and NPPC Subbasin Plan Escapement Goals	12
Table 1.3 Other Agency Jurisdictions	14
Table 2.1 Fish Species and Stocks That Inhabit the Federally Designated Segment of the Clackamas River	26
Table 2.2 Factors Influencing Public Use of Corridor	33
Table 2.3 Regional Recreation Demand SCORP Region 7	36
Table 2.4 Management Indicator Species for the Clackamas River Corridor	37
Table 3.1 Alternate Management Strategies Comparison Matrix	54
Table 4.1 Comparison of Environmental Effects Across Alternatives	90

Appendices Table of Contents

Appendix A - Comparison of Resource Assessment Findings with the Congressional Record	A-1
Appendix B - Results of Oregon Water Resources Department Streamflow Assessment (May, 1991)	B-1
Appendix C - Oregon Sensitive Wildlife Species List	C-1
Appendix D - Sensitive Plant Species - Clackamas and Estacada Ranger Districts (1991)	D-1
Appendix E - Proposed Clackamas ROS Classification Scheme	E-1
Appendix F - Clackamas River Management Plan	F-1
Summary of Alternative D	F-1
Forest Plan Changes	F-9
Implementation Schedule	F-16
Monitoring Schedule	F-21
Appendix G - References	G-1
Appendix H - Glossary	H-1

Preface

Area Overview

The Clackamas River is located on the west side of the Cascade Mountain Range and to the south of the Columbia River Gorge (see Map 1.1). From its origins in the Olallie Lake Scenic Area, the river flows through portions of Marion and Clackamas counties, as well as the communities of Estacada, Barton, and Carver, and is an important water source for urban areas to the west. The river meets the Willamette River at Oregon City, Oregon.

The downstream boundary of the river corridor is less than 50 miles from downtown Portland, and is accessible by State Highway 224. Access to the corridor can also be gained from the southeast, by taking the Breitenbush route (Forest Road 46) from its junction with State Highway 20 at the town of Detroit.

The interim river corridor includes approximately 15,200 acres of land (see Map 2.1). (This area is one-quarter mile each side of the river; the river management plan sets final boundaries.) Of the 15,200 acres, approximately 155 acres are the privately owned Austin Hot Springs area and 288 acres are administered by the Bureau of Land Management. The remainder is administered by the Forest Service, within the Mt. Hood National Forest. The principal land uses within the corridor are recreation, transportation, hydro-electric energy generation and transmission, fish and wildlife habitat, and timber harvest.

Federal and State River Protection

In 1968, Congress enacted the National Wild and Scenic Rivers Act to establish a system for the preservation of outstanding free-flowing rivers. In 1988, Congress designated 47 miles of the Clackamas River into the Federal Wild and Scenic Rivers System, and directed the Forest Service to prepare a management plan to protect and enhance the special values of the river corridor. The portion of the river included in the federal system runs from Big Spring, in the Olallie Lake Scenic Area, to Big Cliff, just upstream of North Fork Reservoir. Congress identified the superb fishery, scenery, and recreation as "outstandingly remarkable values" (ORVs) of the designated segment of the Clackamas River, and noted the presence of seven species of threatened or endangered plants.

Under the Wild and Scenic Rivers Act, segments of designated rivers may be classified as "wild," "scenic," or "recreational," depending on the level of development and access present at the time of designation. Congress assigned "Scenic" status to three segments of the Clackamas, and "Recreational" status to three other segments.

In addition to Federal designation, the mainstem of the Clackamas River from the boundary of the Olallie Lakes Scenic Area to the North Fork Reservoir was also designated an Oregon State Scenic Waterway in 1988. Due to dual designation, Oregon Parks and Recreation Department coordinated with the Forest Service in the development of this document.

Organization of the Document

Chapter 1 (Purpose and Need) provides an overview of relevant river protection legislation, the purpose of this Environmental Assessment/Management Plan and how it was developed, the specific legal and regulatory requirements that this process and document must satisfy, and current plans, policies and agreements affecting river resources and management.

Chapter 2 (Existing Condition) displays the current ("interim") river corridor boundary, and contains a more complete description of the resource values and uses in the designated portion of the Clackamas River corridor, as well as a summary of any resource-specific proposals relevant to the river corridor.

Chapter 3 (Alternatives) displays the proposed final river corridor boundary, describes the desired future condition of Wild and Scenic Rivers (as described in the Forest Plan), and presents a selection of strategies for the river corridor for the next 10 years. Continuation of current management is described under Alternative A - No Action.

Chapter 4 (Environmental Effects) evaluates the effects of the alternative management strategies on the values and conditions described in Chapter 2.

Chapter 5 includes a list of persons and agencies consulted.

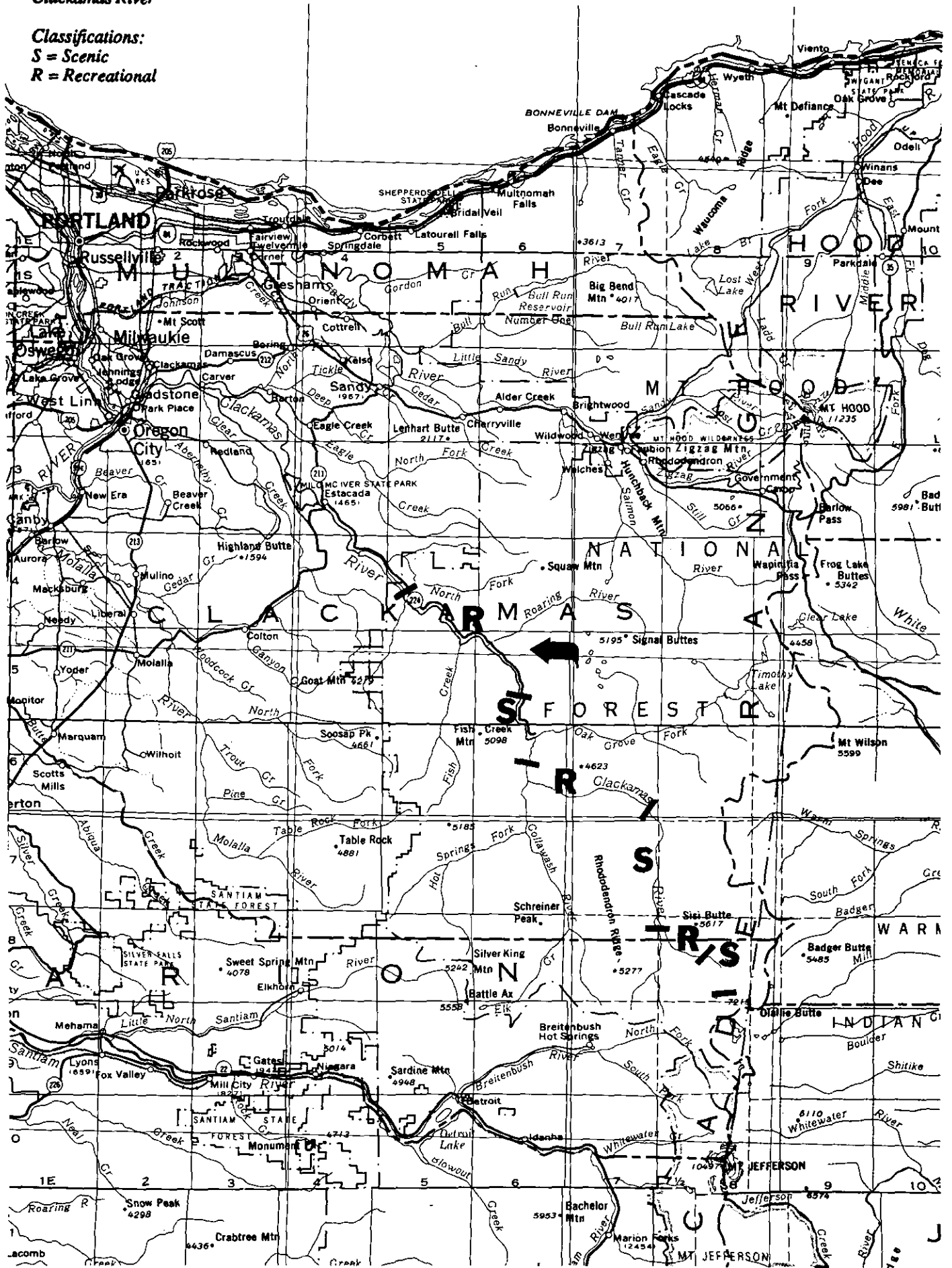
The Appendices provide support information to the main document, and include the proposed Implementation and Monitoring Schedules for Alternative D, which has been identified as the preferred management strategy for the river corridor. For persons interested in further detail or technical documentation, an Analysis File is available for perusal at the Clackamas Ranger District office.

*View of Clackamas River
Corridor*



**Map 1.1 Vicinity Map
Clackamas River**

Classifications:
S = Scenic
R = Recreational



Chapter 1

Purpose and Need

Introduction

Legislative Background

This chapter provides an overview of relevant river protection legislation, the purpose of this Environmental Assessment/Management Plan and how it was developed, the specific legal and regulatory requirements that this process and document must satisfy, and current plans, policies and agreements affecting river resources and management.

Federal Wild and Scenic Rivers

In 1968, Congress passed the National Wild and Scenic Rivers Act (P.L. 90-542), thus establishing a nationwide system of outstanding free-flowing rivers. The Act also provides for the protection of river values for each river in the system, through the development of a river management plan.

The Omnibus Oregon Wild and Scenic Rivers Act of 1988 amended the 1968 Act, adding parts of 40 Oregon rivers to the national system. The Clackamas River was designated for 47 miles, from its headwaters in the Olallie Lakes Scenic Area to Big Cliff, just south of Estacada.

For a river segment to be considered eligible for Wild and Scenic status, it must be "free-flowing" and possess one or more "outstandingly remarkable values" (ORVs). The Congressional Record included the following discussion concerning ORVs for the Clackamas:

"The Clackamas River has several outstandingly remarkable values: a superb fishery, spectacular scenery, and significant recreational opportunities. The river has been identified as one of the most important anadromous and trout fisheries on National Forest System lands in the Northwest Region. The outstanding scenery coupled with the river's proximity to Portland makes it one of the most popular recreation areas in the State. Another significant feature of the river is the confirmation of seven species of threatened or endangered plants."

"The entire Clackamas River is recognized as a significant visual resource. Along the upper half of the river, dense forests and steep canyon walls are varied by large open meadows in the Big Bottom country. The lower half of the river is marked by a deep gorge with views of rock cliffs and tree-laden slopes."

Under the Wild and Scenic Rivers Act, segments of designated rivers may be classified as "wild," "scenic," or "recreational," depending on the level of development and access present at the time of designation. Wild rivers are the most natural appearing and the least accessible. Scenic rivers have shorelines that are largely undeveloped with few access points. On river segments with the Recreational classification, the shoreline is more developed and the road parallels the river more closely and may even dominate the landscape.

Due to differing levels of existing development in the corridor, Congress assigned "Scenic" status to three segments of the Clackamas, and "Recreational" status to three other segments. The sections are roughly delineated on Map 2.1 in the Preface.

The U.S. Forest Service was assigned authority for administration of the Clackamas Wild and Scenic River. Section 10 of the Wild and Scenic Rivers Act provides direction for administration:

"Each component of the National Wild and Scenic Rivers System will be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration, primary emphasis shall be given to protecting its

aesthetic, scenic, historic, archaeologic, and scientific features. Management for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area.”

Oregon State Scenic Waterways

The Oregon Scenic Waterway Act was established by a ballot initiative in 1970. The original Oregon Scenic Waterways system created by the Act included 496 free-flowing miles of six rivers.

Rivers can be added to the system through designation by the Governor or the state legislature. Rivers can also be added to the system by the citizens of Oregon. In 1988, Oregon voters passed the Oregon Rivers Initiative (Ballot Measure #7), which added 573 river miles to the system. These additions included the upper Clackamas River from its headwaters to North Fork Reservoir. There are now segments of 19 rivers (1,148 miles) and Waldo Lake in the State Scenic Waterways system.

The scenic waterway program promotes cooperative protection and wise use of rivers in the system by all agencies (federal, state, and local), individual property owners, and recreationists. Scenic waterways are administered under the authority of the Oregon State Parks and Recreation Commission (ORS 390.805 to ORS 390-925). Administrative rules (OAR 736-40-005 to 736-40-040) have been adopted to govern the program. In addition to the general rules governing the program, specific classifications and sometimes land management rules are generated for each river segment in the system. These classifications and rules are created through the management planning process, and tailored to each river segment to maintain the existing character of the designated river corridor.

Management responsibilities also are assigned under the Act to other state agencies. Depositing fill material in these rivers, removing soil and gravel, or changing river banks in any way, regardless of the amount of soil and rock involved, requires special approval of the Division of State Lands. The Water Resources Department is required to insure that new rights issued within a waterway will be used only for fish, wildlife and recreation. Other uses may be permitted if flow is found sufficient to satisfy the previously stated uses along with existing uses.

Planning Mandate

Two specific pieces of legislation guide the development of this document: the Wild and Scenic Rivers Act, and the National Environmental Policy Act.

Wild and Scenic Rivers Act and Guidelines

The Act Requires the Forest Service to:

“... prepare a comprehensive management plan to provide for the protection of the river values. The plan shall address resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of this Act. The plan shall be coordinated with and may be incorporated into resource management planning for affected adjacent Federal lands. The plan shall be prepared after consultation with state and local governments and the interested public within three full fiscal years after the date of designation.”

The 1982 “National Wild and Scenic Rivers System Final Revised Guidelines for Eligibility, Classification, and Management of River Areas” lists the following series of managing principles, and directs managing agencies to “implement these principles to the fullest extent possible.”

Carrying Capacity Studies will be made during preparation of the management plan and periodically thereafter to determine the quantity and mixture of recreation and other public uses which can be permitted without adverse impact on the resource values of the river area.

Public Use and Access Public use will be regulated and distributed where necessary to protect and enhance (by allowing natural recovery where resources have been damaged) the resource values of the river area.

Basic Facilities The managing agency may provide basic facilities to absorb user impacts on the resource.

Major Facilities Major public use facilities such as developed campgrounds, major visitor centers and administrative headquarters will, where feasible, be located outside the river area.

Motorized Travel Motorized travel on land or water is generally permitted in wild, scenic and recreational river areas, but will be restricted or prohibited where necessary to protect the values for which the river was designated.

Agricultural and Forestry Practices Agricultural and forestry practices will be limited to those which are necessary for protection, conservation, rehabilitation or enhancement of the river area resources.

Water Quality Consistent with the Clean Water Act, water quality in wild, scenic, and recreational river areas will be maintained or, where necessary, improved to levels which meet Federal criteria or federally approved State standards for aesthetics and fish and wildlife propagation.

The Guidelines reference additional management principles concerning land acquisition, water resources development, mining, management of adjacent federal land, hunting and fishing, water rights, and rights-of-way. Supplemental policies are provided for land use controls and new utility rights-of-way.

National Environmental Policy Act (NEPA)

The National Environmental Policy Act of 1969, as amended in 1975, directs all federal agencies to consider environmental impacts, involve the public in decision making, and disclose environmental impacts to the public. NEPA also requires that environmental analysis be interdisciplinary and issue-driven and that direct, indirect and cumulative effects be identified.

State Scenic Waterways Act

The Oregon State Scenic Waterways Act (ORS 390.845) directs State Parks to adopt administrative rules governing the management of land adjacent to State Scenic Waterways, and to base these rules on applicable management principles, standards and plans, based upon the special attributes of the area. These principles, standards, and plans are to protect or enhance the aesthetic and scenic values of the waterway, and permit compatible agricultural, forestry and other land uses. This cooperative EA/Management Plan will provide the actual basis for the adoption of administrative rules for the river corridor.

Planning Process

In developing a management plan for the Clackamas River, the Forest Service (in coordination with the State of Oregon) followed National Environmental Policy Act (NEPA) requirements, including establishing an interdisciplinary team and involving the public. Resource specialists for each of the outstanding values were members of the interdisciplinary team, and several others served as consultants to the team. Outside experts (from universities, other agencies, and the public) were involved in the preparation of the resource assessment and the environmental assessment. Interdisciplinary team members and consultants are listed in Chapter 5. The planning goal, and objectives were as follows:

Planning Goal

Within the framework of issues and opportunities identified in the planning process, develop a concise and implementable strategy for the protection and enhancement of the river-related values of the Clackamas corridor, with specific emphasis on the protection and enhancement of ORVs.

Planning Objectives

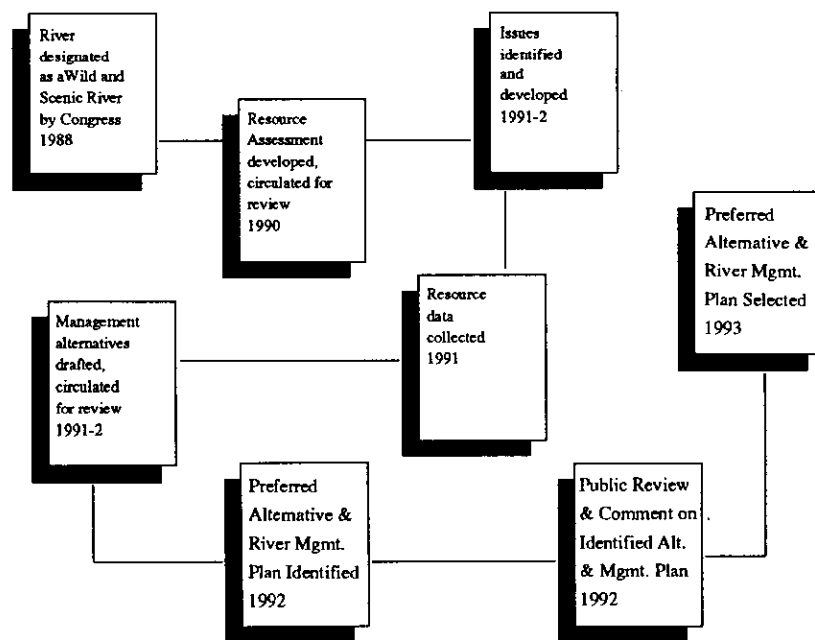
Meet requirements of the Wild and Scenic Rivers Act, National Environmental Policy Act, and State Scenic Waterways Act.

Provide sufficient information to allow effective review, evaluation, and involvement of members of the general public, interest groups, and related agencies in determining the appropriate future management of the Clackamas Wild and Scenic River.

Develop and summarize baseline data for evaluating current conditions of river values and uses, determine relevant management actions, and facilitate monitoring over time.

The planning process implemented to achieve planning goals and objectives is outlined in Figure 1.1.

Figure 1.1 Summary of River Planning Process



Issues and Outstandingly Remarkable Values

Public Involvement

Public involvement has been and continues to be a critical part of the river management planning process. Private citizens, interest groups, state and local governments, other agencies, and tribal groups were all consulted throughout the development of the Resource Assessment and this environmental assessment and management plan. Chapter 5 contains additional information on the public involvement process.

The Outstandingly Remarkable Values (ORVs) and the issues identified in the planning process by the public and agencies, are the “drivers” of Plan development.

Issues

The National Environmental Policy Act defines issues as “... unresolved conflicts regarding alternative uses of available resources.” These can be identified by the public or within the agencies. For the Clackamas, comments from many individuals and groups were condensed into 10 pages of individual comments, from which nine critical issues or themes emerged. These “driving issues” are listed below; they form the basis for generating alternatives. Some are combinations of other, more specific, issues, concerns, and opportunities.

*Table 1.1 Summary of
Issues and Opportunities*

- **The long-term development and maintenance of State Highway 224 and Forest Road 46 may have effects on outstanding river values and the scenic quality of the corridor.**
- **Accommodating greater numbers of recreationists could impact the valued natural setting.**
- **Timber harvest could affect the scenery, ecological function, and water quality of the Clackamas River corridor.**
- **There is an opportunity to restore and reestablish larger populations of native fish, reflective of historical levels and the productive capacity of the river.**
- **Several regionally listed sensitive plant, wildlife, amphibian, and fish species, and a few federally listed (or candidate) plant and wildlife species occur in the Clackamas River corridor, and could be impacted by increased human activity.**
- **Opportunities exist to improve riparian areas that have been heavily altered (and in some cases, eliminated) by activities in the corridor such as highway construction, road building, recreation use, and timber harvesting.**
- **The Clackamas River corridor supports an important old-growth forest ecosystem. Timber harvest and continued highway and recreational development could reduce both the amount and value of the old-growth forest ecosystem in the corridor.**
- **Management actions and public uses within the corridor could degrade existing high-quality water.**
- **Opportunities exist for assisting local economic development efforts by identifying and developing recreational opportunities that would most likely encourage increased spending and employment in nearby**

Outstandingly Remarkable Values

The resource assessment process revisited the ORVs indicated by Congress. To qualify as an ORV, the river-related value must be a unique, rare, or exemplary feature that is significant at a regional or national level. The 1990 Resource Assessment for the Clackamas found the following to be the ORVs:

Botany/Ecology

Old-growth Douglas-fir communities are increasingly less common; the Big Bottom area represents an example of forest vegetation once common along Cascade rivers.

Fish

The Clackamas River contains the last significant run of wild late-winter coho in Columbia Basin (one of two remaining historic runs of spring chinook in the Willamette Basin), and an important population of winter steelhead.

Wildlife

Bald eagle, elk and northern spotted owl are present. There is potential habitat for peregrine falcon. Outstanding potential exists for wildlife-related interpretive opportunities.

Recreation

The close proximity to Portland results in high recreation demand. A diversity of recreational opportunities exist, including whitewater boating. There is a high potential for recreation-related interpretive opportunities.

Cultural Resources

There is evidence of significant human use prior to European exploration and settlement, as well as a wide variety of evidence of historic use. The Clackamas River has played an important role in local and regional development.

The above listed ORVs were also found to be "Special Attributes" by the Oregon State Parks & Recreation Department through its resource analysis process.

The Wild and Scenic Rivers Act requires coordination with other agencies in developing the management plan. Several agencies have jurisdiction over resources and uses in or affecting the designated portion of the Clackamas River. Those entities with specific policies relevant to management of the Clackamas and its resources are described below. Agencies with general jurisdiction over relevant areas or resources are listed in Table 1.2.

U.S. Forest Service

The Forest Service is responsible for overall land management responsibilities on National Forest lands. The 1990 Mt. Hood National Forest Land and Resource Management Plan (also called the Forest Plan) provides direction for management programs, practices, uses and protection measures on the Forest. The Forest Plan recognized the five designated wild and scenic rivers on the Mt. Hood National Forest with a special management area designation (B-1) Designated Wild and Scenic Rivers. The Plan incorporates the general guidance of the Wild and Scenic Rivers Act into "standards and guidelines" for the B-1 Management Area.

Existing Plans, Policies, and Agreements

In addition to B-1 lands, the Clackamas corridor includes other Management Area designations for such components as riparian areas, earthflow, old-growth forest and deer and elk winter range. Areas upslope of the interim one-quarter mile river corridor are managed as "Scenic Viewsheds."

The Forest Plan is currently being implemented along with the findings of the 1990 Clackamas River Resource Assessment in determining interim management of the river corridor. This River Management Plan is intended to refine the guidance of the Forest Plan. Upon its completion, the Forest Plan will be amended to incorporate the River Management Plan, and any changes to related standards and guidelines. The environmental assessment for the Clackamas River is tiered to the final Environmental Impact Statement for the Forest Plan.

Individual project plans, such as a timber sale or construction of a campground, require a separate NEPA analysis but are tiered to the river management plan and must achieve those goals and objectives.

Columbia River Basin Anadromous Fish Habitat Management Policy Implementation Guide

On January 25, 1991, the Regional Foresters from Forest Service Regions 1, 4, and 6 signed the Columbia River Basin Anadromous Fish Habitat Management Policy Implementation Guide (PIG). The policy states that the Forest Service in the three regions fully supports and will participate in the achievement of Columbia Basin anadromous fish restoration goals. The PIG restates from the Forest Service Manual riparian-dependent resources are given preferential management over other resources in cases of conflict. The PIG provides guidance for implementing the policy by breaking up the implementation tasks into ten subject areas. For example, areas that pertain to the Clackamas Wild and Scenic River management plan are:

- establishing objectives for anadromous fish production capability,
- developing Memorandums of Understanding (MOUs) with anadromous fish management entities,
- describing desired future condition for riparian areas,
- defining fish production capability,
- developing a monitoring strategy,
- defining cumulative effects assessment procedures, and
- implementing projects.

Part of the policy is to review existing Forest Plans for consistency with the policy. If they are not consistent, the forests will consider amending their Forest Plans. This assessment and planning process is consistent with these requirements.

The Forest Service along with the Bureau of Land Management made commitments to implement portions of the Salmon Summit Agreement. The Forest Service is committed to developing staffing and budgets to fully implement the policy by October 1, 1993. The Northwest Power Planning Council coordinates establishing priorities, identifying and procuring funding, and monitoring implementation of the commitments. These commitments also include acquisition of easements in privately owned riparian areas and adjacent lands of sufficient width to improve and maintain salmon and steelhead production.

Bureau of Land Management

The BLM administers portions of the river corridor near Big Cliff. General management guidance for BLM-administered lands in the Clackamas River corridor is provided by the Resource Management Plan for the Salem District. The management plan for these lands is currently being prepared.

Oregon State Parks and Recreation Department

The Oregon State Parks and Recreation Department is responsible for the acquisition, improvement, maintenance, and operation of Oregon's state park system. The department is also responsible for giving technical assistance to local government agencies on park matters, develops and maintains the Statewide Comprehensive Outdoor Recreation Plan (SCORP), and administers the Federal Land and Water Conservation Fund matching grant program in Oregon. The department also administers the Scenic Waterway Program. The program includes:

- the development of scenic waterway management plans,
- the review of land use changes and new development in scenic waterways, and
- the right to make application for instream water rights for recreational purposes.

The Upper Clackamas (from Olallie Lake Scenic Area to North Fork Reservoir) was designated a State Scenic Waterway in 1988. This portion of the Clackamas was given an interim classification of "Recreational River Area" while this plan was being developed. Typically this classification contains mixed agricultural, residential or commercial development along lands adjacent to the river. A "Recreation River Area" is often rural or pastoral in character and easily accessible from local roads. Under the state program, these areas are managed to protect the view from the river, to allow development consistent with existing land uses, and to provide for a wide range of recreational activities within the scenic waterway.

Since there is only one parcel of private land along the river, the department did not develop specific guidelines for new development. This 150 acre parcel at Austin Hot Springs is zoned for "forest use" based on the Clackamas County Plan and Zone regulations. Land use regulations are considered adequate protection if further development of the parcel is proposed.

Presently the Oregon State Parks and Recreation Department is proposing permanent classifications and land management recommendations for the Upper Clackamas River that can be found in Table 3.1. The analysis file contains copies of relevant state and county regulations.

Oregon Department of Transportation (ODOT)

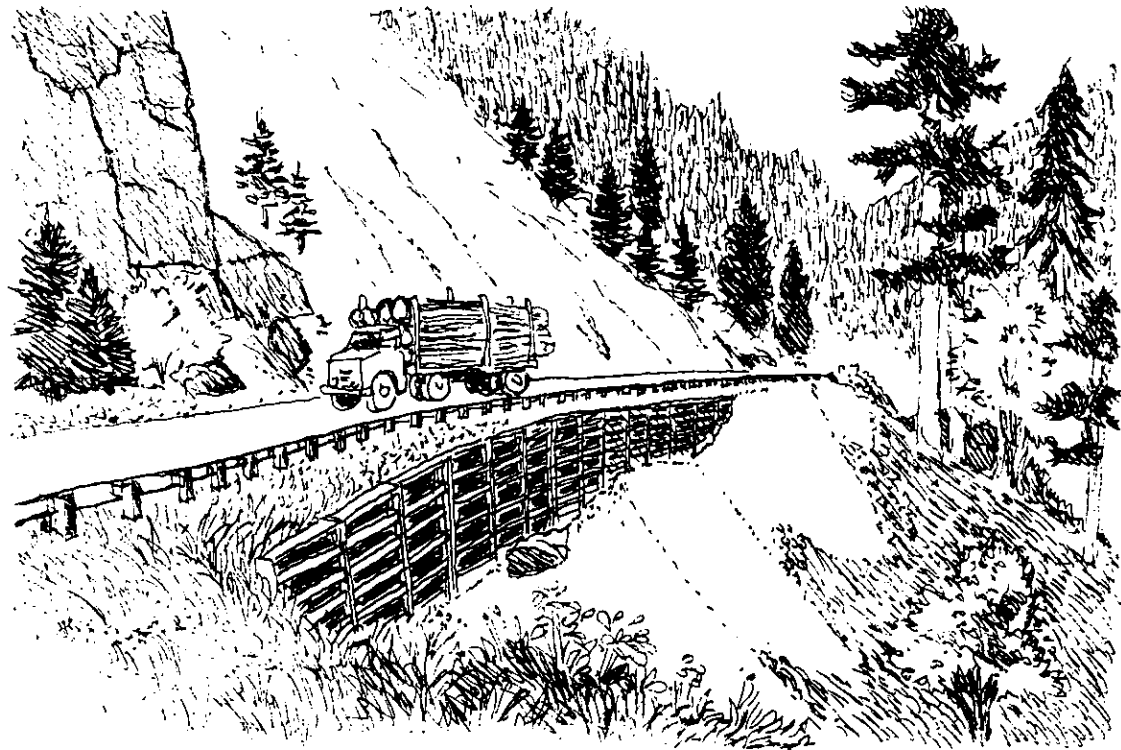
ODOT is responsible for planning, designing, constructing and maintaining State Highways. ODOT requires authorization to use National Forest Lands for highway rights-of-way, waste areas and material sources for highway construction, reconstruction and maintenance.

The Memorandum of Understanding Title 1500 - External Relations, 1535.13 --1 describes coordination and responsibilities of the Forest Service and ODOT for survey, design, plan approval, and construction authorization for both new and reconstruction activities. Additionally, it includes responsibilities for maintenance, signs, access, and landscape management.

ODOT informs the Forest Supervisor of planned highway construction, highway relocations, and highway betterment projects that could have an impact on National Forest lands. ODOT can request that the Forest Service prepare an environmental assessment for a proposed highway improvement project.

In addition to construction and reconstruction responsibilities, ODOT maintains the highway within the existing road prism. The agency also has the authority and responsibility for installing and maintaining all signs within the State highway right-of-way, and for determining access points onto the State highway.

Highway 224



Division of State Lands

Under state law, the Division of State Lands (DSL) is responsible for managing the beds and banks of navigable water bodies (ORS 274.005-274.590). DSL is the administrative arm of the State Land Board (the Board), composed of the Governor, Secretary of State, and State Treasurer. Under constitutional and statutory guidelines, the Board is responsible for managing the assets of the Common School Fund. These assets include the beds and banks of Oregon's navigable waterways and are to be managed for the greatest benefit of Oregonians, consistent with environmentally sound land management practices. Protection of public trust values of navigation, fisheries, and public recreation is paramount.

DSL has determined that there is likely sufficient evidence to support a claim of navigability and state ownership for the beds and banks of the Clackamas River from its mouth to just upstream of the 4650 Bridge (RM 65).

For purposes of managing the this portion of this river, any non-federal activities or land uses such as new utility or transportation corridors and boat ramps or similar facilities that impose into or cross a waterway below ordinary high water will require an easement from the State Land Board. Existing non-federal facilities will require an easement at such time as they undergo major structural alteration, replacement, or relocation. In addition, removal of sand and gravel requires a royalty lease and any non-federal use that occupies any area of submerged or submersible land requires a waterway lease.

Further, the DSL also administers the State's Removal-Fill Law which protects Oregon's waterways from uncontrolled alteration. The law requires a permit for fill or removal of more than 50 cubic yards of material within the State's waterways. The permit-review process involves coordination with the natural resource and land use agencies from the local through the federal levels. Because the Clackamas is also a State Scenic Waterway, special authorization is needed from the Board and DSL for "any alteration of the beds and banks" of the designated portion of river (ORS 390.835).

The State Scenic Waterways Act requires that the State Land Board approve any alteration of the bed and/or banks of a scenic river or wetlands within the scenic waterway, regardless of the amount of material involved. Generally, the Board will prefer non-structural techniques, such as bank sloping and revegetation, for bank projects, rather than hardened structures. In its review of a proposed project, the Board will consider the management goals and recommendations of this plan, and may require mitigation as a condition of approval.

Oregon Water Resources Department (WRD)

The WRD is responsible for management and allocation of the state's water resources. The Water Resources Commission typically develops policy through the preparation of basin plans for each of Oregon's 18 river basins. Through Basin plans, the WRD classifies stream flow for certain purposes, such as domestic use, industry, municipal, recreation or irrigation. The plans are adopted as administrative rules which reflect how water is currently used, and its future use and allocation.

The WRD issues water rights on all waters in the state and enforces the exclusion of dams, impoundments, and placer mining in scenic waterways and on tributary streams within scenic waterway boundaries. In addition, the Scenic Waterway Act requires the Water Resources Commission to review proposed land condemnations and to review new scenic waterway management plans and scenic waterway additions proposed by State Parks for designation by the Governor.

Minimum perennial stream flows are administrative designations established by the Water Resources Commission. A law passed in 1987 by the Legislature allows for the conversion of minimum perennial stream flows to instream water rights. Three state departments may apply for these instream rights: Parks and Recreation, Fish and Wildlife, and Environmental Quality. Once granted, the instream water right is held by WRD in trust for the people of Oregon.

A 1988 Oregon Supreme Court decision (*Diack vs. City of Portland*) found that the Water Resources Commission must make findings on the effects of new consumptive water uses on state scenic waterways. Because of this court ruling, WRD is working closely with State Parks and other agencies to quantify stream flow needs for scenic waterways.

Oregon Department of Fish and Wildlife

The Oregon Department of Fish and Wildlife (ODFW) is responsible for management of all fish and wildlife populations on public and private lands within state boundaries, regulates all commercial and recreational harvest of fish and wildlife, and has the authority to request in-stream water rights to protect fish and wildlife resources. The Forest Service manages habitat for fish and wildlife on National Forest System lands, and coordinates with ODFW to achieve common objectives.

ODFW also has specific policies related to management of the Rocky Mountain elk herd in the Clackamas drainage, management of osprey nest sites, and the management of wild (non-hatchery) fish in areas designated as Wild Fish Waters. ODFW's Sub-Basin Plan for the Clackamas drainage includes a determination of the "biological potential" (numbers of fish supportable under current habitat conditions), and sets "escapement goals" (numeric goals for numbers of anadromous fish returning to spawn), by species, returning over North Fork Dam. These goals are consistent with goals set forth by the Northwest Power Planning Council, and are as follows:

*Table 1.2 1991
Determination of
Clackamas River
Biological Potential, 1991
Escapement Over North
Fork Dam, and ODFW
and NPPC Subbasin Plan
Escapement Goals*

Fish Species	Biological Potential	1991 Escapement Over North Fork Dam	ODFW/NPPC Plan Escapement Goals
Spring chinook salmon	3,700	> 4,500	2,900
Late-run coho salmon	4,500	334	3,000
Native winter steelhead	4,300 - 13,000	482	3,000

Wild Fish Management Policy

Oregon's Wild Fish Management Policy (OAR 635-07-525-529) states that the protection of genetic resources shall be the priority in the management of wild fish to assure optimum economic, commercial, recreational, and aesthetic benefits for present and future residents of Oregon. "Wild fish" are any naturally spawned anadromous and resident salmonids, sturgeon, and all fishes listed as sensitive by the Oregon Fish and Wildlife Commission, descendent from a population that was present in the same geographical area prior to the year 1800.

The Wild Fish Management Policy prevents ODFW from stocking hatchery fish into wild populations not currently stocked without Fish and Wildlife Commission approval. The policy directs ODFW to manage populations at the breeding level. For example, the policy directs that except for genetically similar fish, hatchery fish that spawn at the same time and place as the wild population, shall comprise no more than 10 percent of the total number of naturally spawning fish. Further, under this policy, ODFW will oppose introductions of fish of the same or different species that will cause mortality to wild fish from competition, predation, or disease, and that will prevent the meeting of natural production objectives in subbasin management plans.

Marion and Clackamas Counties

The state and federally designated corridor is located in Clackamas and Marion Counties. The eight miles above the Forest Road 46/4690 junction are in Marion County. The corridor downstream from this point to its terminus near Big Cliff is in Clackamas County. Both counties have Comprehensive Plans for their sections of the river corridor. However, county planning and land use jurisdiction is superseded by federal jurisdiction on federally administered lands. Therefore, the only land in the corridor subject to county land use regulations are the 155 acres of privately held land at Austin Hot Springs in Clackamas County.

Oregon state law requires counties to adopt comprehensive plans that are compatible with specially designated natural areas including federally designated Wild and Scenic Rivers and state designated scenic waterways. Goal 5 directs counties and cities to resolve conflicting land uses in natural areas.

The Clackamas County Comprehensive Plan, Natural Resource and Energy Element, establishes a River Conservation Area for the Clackamas River. The Plan provides detailed management policies for the area addressing timber harvesting, erosion and sedimentation, development and design of structures, setbacks, access, buffer strips, flow standards, impoundments, recreation, and water quality. These policies apply to lands within one-quarter mile from the river's mean low water line. The County Plan also notes that, where these policies conflict with State and Federal Act provisions, State and Federal policies will prevail.

The Austin parcel is zoned "General Timber District." Allowed uses under this zoning include timber management and associated support uses. According to County staff, there exists a vested right to use the property for recreation at a level known to have occurred historically, but any development (e.g., parking, paving, tubs, buildings, etc.) to support such use would require a conditional use permit. Any such improvements would have to conform with County, State, and Federal river management policies.

Portland General Electric Company (PGE)

PGE has owned and operated the Oak Grove Hydroelectric Project since the early 1920's, located on "withdrawn" National Forest lands. The Oak Grove Project includes Timothy Lake Dam and Reservoir (including a small powerhouse for local power); Harriet Lake Dam and Forebay; a water transmission pipeline and corridor to the Oak Grove powerhouse near Sandstone Bridge (with an associated surge tank); Frog Lake Dam and Forebay; access roads; the Oak Grove Powerhouse (on the Clackamas), and the Three Lynx Community. Also included is a transmission line corridor, which generally parallels the Clackamas from the powerhouse to Portland.

Operation of these facilities is guided by specifications in a 1980 Federal Energy Regulatory Commission (FERC) License. Article 34 of that License requires consultation and cooperation with relevant agencies for the "protection and development of the environmental resources and values of the project area." A 1981 Memorandum of Agreement (MOA) provides further specifications on the implementation of this article. (Representatives of the Oregon Division of State Lands note that these facilities will require a lease from the State of Oregon (DSL) at the time of relicensing (Lilly, 1992).

Table 1.3 Other Agency Jurisdictions

Federal Energy Regulatory Commission	Jurisdiction for licensing and regulating hydro-electric and geothermal developments.
Northwest Power Planning Council	Development and administration of Columbia River Basin Fish and Wildlife Program. The Northwest Power Act directed the Council to "protect, mitigate, and enhance fish and wildlife affected by the development, operation, and management of (Columbia Basin hydro-electric) facilities." In 1987, the Council established an interim goal of doubling the current salmon and steelhead runs that return to the mouth of the Columbia River.
Pacific Fishery Management Council	Regulation of commercial fish harvest of Pacific salmon.
Oregon Department of Forestry	Enforcement of State Forest Practices Act on private lands.
Oregon State Marine Board	The State Marine Board registers motorized watercraft, establishes equipment and operating requirements for the safety of the environment, regulates the use of boats on Oregon waters, and provides training for county sheriffs and state police officers who patrol the waters. State Marine Board regulations prohibit motorized craft on this section of the Clackamas. In accordance with OAR 250-30-030, permit systems for commercial and non-commercial boating activities can be established by the Board for both state scenic waterways and federal wild and scenic rivers. Outdoor guides and outfitters must register with the Board.
Oregon Dept. of Environmental Quality	Regulation of State air and water quality. Authority over instream rights for water quality for Scenic Waterways.
Oregon Department of Agriculture	Implementation of Oregon Endangered Species Act, cooperation with USFWS on federal Endangered Species Act studies. The ODA has a cooperative agreement with the USFWS involving research and conservation programs for plant species under the auspices of the federal Endangered Species Act.

¹ Congressional findings were revisited in 1990, during preparation of the Resource Assessment for the Clackamas River. See Appendix A for a comparison of the findings of the Assessment and the Congressional Record. This document is based upon the ORVs as discussed in the Resource Assessment.

Chapter 2

Affected Environment

Introduction

This chapter describes the character and resources of the designated Clackamas River corridor, for one-quarter mile on each side of the river and adjacent lands. The current conditions, as well as any known trends, are described to acquaint readers with the corridor and to provide a basis for assessing the consequences of various alternatives presented in Chapter 3.

River Overview

The Clackamas River is located to the west of the Cascade Range and to the south of the Columbia River Gorge. From its origins in the Olallie Lake Scenic Area, the river flows through the communities of Estacada, Barton and Carver, and is an important water source for southern Clackamas County. The river joins the Willamette River at Oregon City. The designated portion of the river runs for 47 miles from Big Spring (headwaters area) to Big Cliff, just south of Estacada (see Map 2.1).

The Clackamas drainage incorporates portions of two major physiographic zones, the Cascade Mountain range and the Columbia Basin. The Clackamas is the only west side Cascade river which flows northwest out of the mountains. This occurs because of a series of faults which line up in a diagonal across the state. Almost all of the river follows this major weakness in the underlying bedrock of the region. The Clackamas is the largest west side Cascade river primarily because the fault patterns provided a larger area for the watershed to develop.

The headwaters of the Clackamas receive ample rainfall and snow with approximately 130 inches of precipitation a year. Rainfall in the lower reaches averages 60 inches a year. The climate is classified as temperate. The Clackamas River upstream from Big Cliff drains a watershed of approximately 666 square miles (640 square miles, excluding the South Fork Clackamas River). Major tributaries of the upper the Clackamas River include the South Fork of the Clackamas (RM 35.5), Fish Creek (RM 41.3), Roaring River (RM 43.7), Oak Grove Fork (RM 53), and Collawash River (RM 56.8). Streams and rivers in the Clackamas drainage have been subject to hydro-electric development, with power generation facilities located on the Oak Grove Fork of the Clackamas and on the mainstem (in the designated corridor). Several dams are situated between Big Cliff and Oregon City.

The mean elevation of the watershed is 3,500 feet, corresponding approximately with the transition from a Douglas-fir and western hemlock forest to the higher elevation true fir and lodgepole pine forests. Elevations range from around 740 feet to 7,200 feet. Only 2 percent of the watershed area is above 5,000 feet elevation. Earthflows dominate the topography in much of the watershed, particularly within the Collawash River drainage and areas adjacent to the Clackamas River in the vicinity of Ripplebrook. Channel gradients are steep within the headwaters reaches, gradually becoming less steep moving downstream. Slope aspects are generally equally represented in the watershed, although the upper reaches of the mainstem above Big Bottom have more northerly exposures.

The designated river corridor is entirely within the Mt. Hood National Forest boundary and encompasses forested lands, wetlands and riparian areas, and rock cliffs. Land uses within the corridor include recreation, transportation, hydro-electric energy generation and transmission, and fish and wildlife habitat. Timber harvest in the corridor has been a relatively minor land use in recent years.

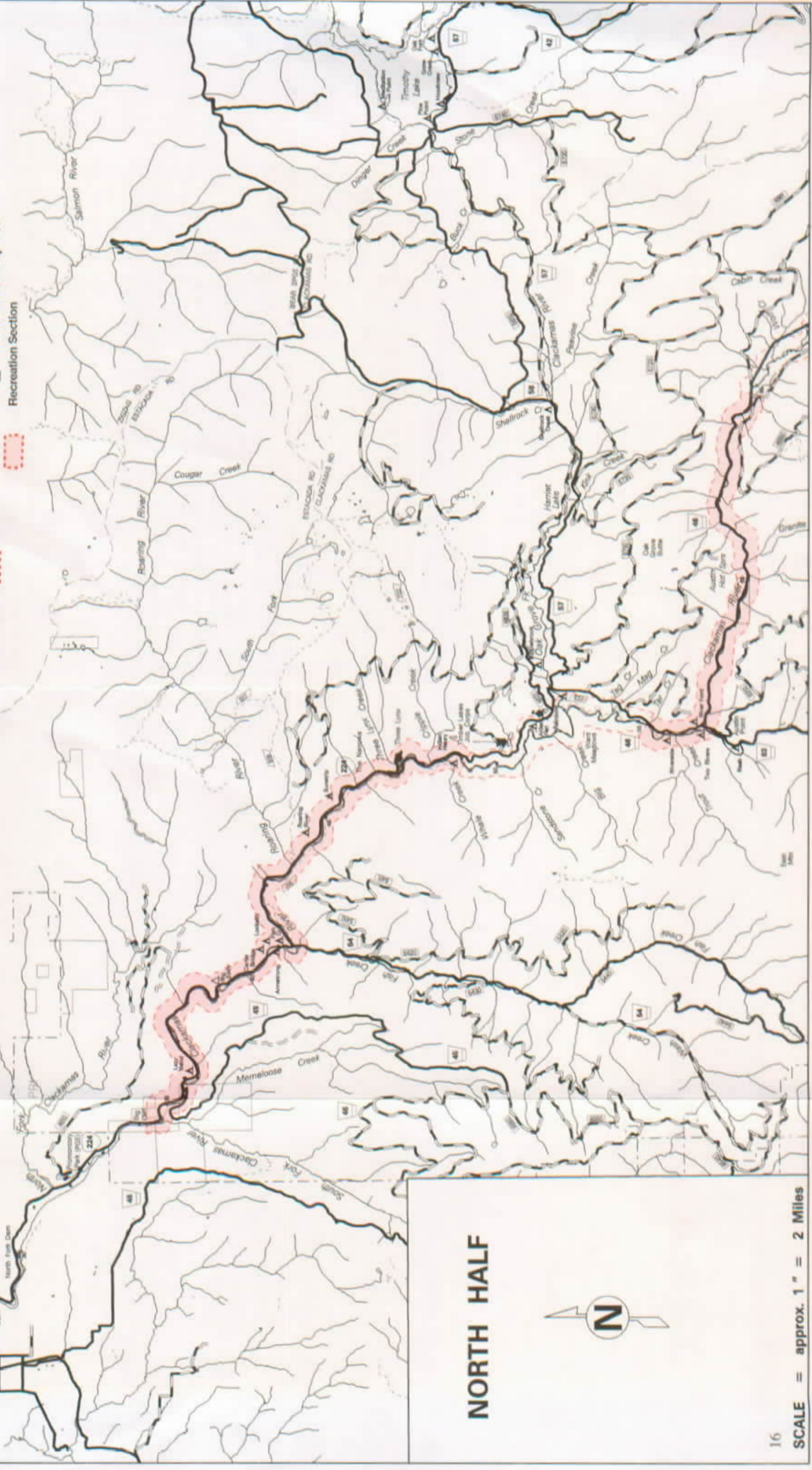
There is a one-mile stretch of river containing approximately 155 acres of privately owned land at Austin Hot Springs. There is one-half mile of shoreline, and 288 acres of land administered by the Bureau of Land Management. These are the only areas within the 15,200-acre interim river corridor that are not administered by the Forest Service.

Map 2.1 Clackamas River Corridor
North Half

CLACKAMAS RIVER STATE SCENIC WATERWAY AND INTERIM NATIONAL WILD AND SCENIC RIVER CORRIDOR

LEGEND

-  Corridor Boundary
-  Paved Road
-  Gravel Road
-  Primitive Road
-  Trail
-  Forest Boundary
-  River Mileage
-  Scenic Section
-  Oregon State Highway
-  National Forest Primary Route
-  Forest Route
-  Ranger Station
-  Campground
-  Picnic Area / Day Use
-  Recreation Section



NORTH HALF



Map 2.1 Clackamas River Corridor
South half



SOUTH HALF
CLACKAMAS RIVER
STATE SCENIC WATERWAY AND
INTERIM NATIONAL WILD AND
SCENIC RIVER CORRIDOR

MT. HOOD NATIONAL FOREST

1993

SCALE = approx. 1" = 2 MILES

LEGEND

	Corridor Boundary		Oregon State Highway
	Paved Road		National Forest Primary Route
	Gravel Road		Forest Route
	Primitive Road		Ranger Station
	Trail		Campground
	Forest Bdy		Picnic Area / Day Use
	River Mileage		Recreation Section
	Scenic Section		



A Visit to the Clackamas

Let's take a journey down the river, beginning at its headwaters near Olallie Lake and ending at Big Cliff, above North Fork Reservoir. At its upper end, at an elevation of about 4,500 feet, the landscape is a nearly level volcanic plateau, densely forested with mountain hemlock, Pacific silver fir, Douglas-fir, lodgepole pine, and western larch. Openings are infrequent and small, centering around shallow lakes that dry up by the end of summer, or in meadows that occupy the basins of former lakes. This plateau is punctuated by forested volcanic buttes, including Lemitu, West Pinhead, and (the largest) Sisi.

The Clackamas is little more than a mountain brook at its upper end, and at the height of the dry season (usually late September), may be completely dry. As the river leaves the Olallie Lake Scenic Area, it crosses under a large power transmission line. Two miles farther downstream, numerous year-round springs emerge and a cool, rushing river appears. Clearcuts checker hillsides on either side of the river, and views across openings reveal a heavily harvested area to the northwest known as Rhododendron Ridge, and the brown cast of spruce budworm damage near Sisi Butte.

Further downstream, steep talus slopes and rock outcrops are common as the river cuts its way down through the basal. Upon reaching Forest Road 46, the terrain levels off onto a broad basin. The river slows as it reaches the Big Bottom area where the channel braids its way through huge logjams and beaver dams. The trees here are old-growth Western redcedar and Douglas-fir. Big Bottom stretches down about four miles, to the bridge at the 4650 road.

Downstream from this bridge, the river moves swiftly in a narrow channel that flows through nearly vertical cliffs and forest-covered slopes and crosses under another large power transmission line. The highway is very close to the north bank of the river, separated only by a boulder-strewn embankment. In places, there are wetlands between the road and the steep south-facing slope where the road apparently cut off a former river channel. The road is narrow and close to the river. There are few places to safely pull over to fish or to enjoy the scenery.

At Austin Hot Springs, the only tract of private land in the designated corridor, all of the large trees and most of the younger ones have been removed, right down to the river bank on both sides of the river. Steam rises from the river in several places, not yet harnessed for the private resort that had been planned for the area.

Two miles past Austin Hot Springs, the Collawash River joins the Clackamas. At this point the character of the landscape changes and the river becomes slow, wide, and shallow. The highway is farther from the river, and hikers can use the Riverside National Recreation Trail that traverses the steep slope along the east bank.

At this point, the road winds through a forest dominated by old-growth Douglas-fir, hemlock, and cedar. Adjacent to the river corridor, along Highway 224 are two large National Forest administrative sites: Timber Lake Job Corps Center, and Ripplebrook Ranger Station. There are several well-worn trails down to the river. One of these, at Alder Flat, leads to a walk-in campground about a mile from the highway. A short walk below the campground is the famous "Killer Fang", a raging torrent plunging through polished basal cliffs, which has claimed the lives of several boaters.

From here down to the North Fork Reservoir, the river rushes from one rapid to another. River rafts commonly launch near Indian Henry campground. The dominant features of the landscape are the wide swift river, and the densely forested slopes, interrupted by an occasional grassy opening or rock outcrop. These are the natural features, but human work is also evident here. The Three Lynx hydro-power plant discharges water back into the Clackamas River which was diverted from the Oak Grove Fork far upstream. The highway is now much wider than before, with broad curves flanked by steel guard rails, and banks heavily armored with boulders and retaining walls. There is a cleared right-of-way with steel transmission towers that carry Three Lynx-generated electricity down along the river.

Traffic on the highway moves much faster here. The character of the landscape is dramatic, especially at places like "The Narrows", where the river slices through river-shaped basalt. Between Indian Henry and Fish Creek, the Clackamas River Trail winds along the steep slope opposite from the highway. The views are impressive, but the highway cuts, fills, guardrails, and traffic are an almost constant companion. The river, highway, and powerlines seem to hug the base of vertical basalt, and campsites occupy any bit of level ground in the area.

The river current gradually slows as it enters the North Fork Reservoir and leaves the designated portion of the river.



Streamflow Regime

The pattern of annual streamflow of the Clackamas River generally follows the pattern of annual precipitation amounts, reflecting evapotranspiration losses. The pattern may vary somewhat during the winter months depending on the amount and distribution of snowfall and climatic conditions. Mean annual discharge recorded at the Clackamas River stream gauging station, immediately downstream from the Three Lynx hydroelectric facility, is approximately 2,000 cubic feet per second (cfs). Since 1909, the minimum recorded discharge at Three Lynx was 275 cfs in September of 1987. The maximum recorded flow was 68,200 cfs, in April of 1990.

The monthly streamflow pattern for the Clackamas and its tributaries is highly variable from November through June. On average, this 8-month period accounts for about 85 percent of the annual precipitation and 80 percent of the annual runoff. During the summer low flow period, streamflow is relatively uniform.

Water Quality

Relatively little quantified water quality data exist for the upper Clackamas River and its major tributaries. Comprehensive information is provided by the "1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution," published by the Department of Environmental Quality (DEQ). The Statewide Nonpoint Assessment presents and discusses the impacts of nonpoint sources of pollution on four key topics, i.e., the major beneficial uses:

- water quality conditions affecting fish;
- stream quality conditions affecting aquatic habitat;
- water quality conditions affecting water contact recreation or shellfish; and
- water quality conditions affecting drinking water supply.

Conditions Affecting Fish

Pollutants and other water quality parameters that affect water quality for fish include turbidity, low dissolved oxygen, elevated water temperature, dissolved gases, abnormal pH, and toxics. See also Fisheries section.

Conditions Affecting Aquatic Habitat

Physical features other than water quality can indicate whether beneficial uses are being supported within a stream. Fish habitat can be affected by sedimentation, streambank erosion, excessive debris accumulation, low flows, and insufficient stream structure. Sedimentation can clog fish spawning gravels. Streambank erosion removes cover and destroys vegetation used as shade and as a source of insects for food. Excessive debris and low flows may hinder fish passage. Low flows may also reduce the volume of habitat and intensify other water quality problems. Lack of structure may reduce channel stability, the quality of fish habitat, or the flow-regulating characteristics of a stream.

The upper reach of the South Fork of the Clackamas was determined to be moderately affected due to sediments, as discussed previously. Wash Creek, a tributary to Fish Creek, was determined to be lacking in structure needed by fish. This has largely been corrected through recent efforts to restore large organic material to the channel, subsequent to the assessment conducted by DEQ. The Oak Grove Fork was rated as being severely affected by low flows and the absence of structure. Recent projects to restore structure through the introduction of large woody material would partially alleviate these problems.

The Hot Springs Fork of the Collawash was also determined to be lacking stream structure, with adverse effects on fish habitat quality. Several projects to restore channel structure have been completed recently and appear to be successful. Tributaries to the East Fork of the Collawash were again cited as having sediment problems affecting habitat quality. While little can be done to correct the natural instability of these areas, Forest Plan standards related to earthflows should reduce or eliminate the occurrence of accelerated erosion due to human activities.

Conditions Affecting River Recreation

Pollutants affecting recreation include nutrients, excessive plant growths, objectionable floating materials and pathogenic bacteria. The DEQ assessment cited no streams within the Clackamas River watershed (above North Fork Reservoir) as having water quality problems affecting river recreation.

Conditions Affecting Drinking Water Supplies

Pollutants which affect this use include turbidity, pesticides and toxic chemicals. Some drinking water pollution problems are "treatable"-- that is, the polluted water can be made safe for human consumption through disinfection, filtration, or some other conventional treatment process. The Oregon Environmental Quality Commission (EQC) has determined that it is reasonable to expect that water be treated before human consumption and that water quality in streams and other water bodies need not be maintained at human consumption standards.

There are no streams cited as having severe water quality conditions affecting drinking water supplies. Station Creek, serving the Ripplebrook Forest Service facilities, was cited as having a moderate problem due to bacteria or other microbial contamination, but that concern is alleviated through routine water treatment prior to distribution.

Water Temperature

Various water temperature studies and short-term measurements have been undertaken on several stream reaches within the Clackamas watershed. Daily maximum temperatures for the Clackamas River at Big Bottom range from 38 degrees F (usually occurring in December to February) to 55 degrees F in July or August. Daily minimum temperatures ranged from 38 degrees to 50 degrees for the same periods. Short-term measurements taken on the river near Three Lynx and above the South Fork indicate that daily temperatures range from 41 degrees to 62 degrees during the months of March through September.

Existing and Potential Water Uses

The Geological Survey, Department of Interior (USGS), currently operates four stream gauging stations within the watershed. They include: Oak Grove Fork, near Government Camp (Timothy Lake); Oak Grove Fork, above Power Plant Intake (above Lake Harriet); Clackamas River, above Three Lynx Creek (below Powerhouse); and Fish Creek. These consist of equipment shelters, gauging equipment and cableways, and do not impede the flow of any streams.

Consumptive Uses

Exclusive water rights to the South Fork of the Clackamas River are held by Oregon City and West Linn for municipal uses (1931). Three permits entitle these communities to divert water at a total rate of 50 cubic feet per second. Currently these rights are not being exercised.

Consumptive water uses are limited within the watershed above the confluence with the South Fork and are associated with domestic water use at Forest Service facilities (offices, residences, campgrounds, etc.) and at PGE facilities at Three Lynx and Timothy Lake. The quantity of water diverted or pumped from wells ranges from three gallons per minute to 3.3 cubic feet per second (Station Creek, Ripplebrook). Existing consumptive water uses, excluding the South Fork Clackamas River, do not exceed 5 cubic feet per second from the Clackamas or its tributaries. A complete listing of developed water uses is on file at the Mt. Hood N.F. Supervisor's Office.

No additional consumptive uses are proposed or anticipated at this time. The Water Resources Department recently adopted changes in Willamette Basin Rules governing the issuing of water rights. The Clackamas River and its tributaries from North Fork Reservoir to the headwaters, excluding the South Fork, are classified only for domestic, livestock, and public instream uses.

Water Rights

Instream water rights have been established to maintain flows for fish and aquatic life and to maintain fish habitat for the river and several tributaries. These include: 1) Clackamas River, Big Bottom section, 2) Clackamas River, below Collawash River, 3) Pinhead Creek, 4) Collawash River, 5) Oak Grove Fork, 6) Roaring River, and 7) Fish Creek.

The appearance of the Clackamas River and its tributaries is due in large measure to the influence of relatively infrequent "channel forming" peak flows or floods. The most recent example of such an infrequent event was the December, 1964 peak flow which scoured much of the Clackamas and many of its tributaries. *Such peak flows contribute large quantities of sediment and debris into the river system. The high flows are also responsible for re-aligning and removing much of the same material. In the process, new channels are formed, pools and riffles are created, and the channel character is redefined. Minimum instream flow requirements for fish habitat or recreational use do not address periodic "catastrophic" changes such as those associated with the 1964 flood.*

In 1991, the Water Resources Department conducted a study to assess minimum instream flows for recreation on the Clackamas. Appendix B includes the results of this study.

Hydroelectric Uses

PGE operates five dams in the Clackamas River basin. River Mill, Faraday, and North Fork dams occur on the Clackamas River. Harriet and Timothy dams are located on the Oak Grove Fork of the Clackamas River. All of these are outside the designated river corridor. Water diverted from Harriet Lake into a pipe is returned to the Clackamas River at Three Lynx.

PGE is currently studying a proposal to augment the capacity of its existing Oak Grove Project through diversion of portions of several tributaries to the Clackamas into the existing power generation facility.

Groundwater and Aquifer Recharge

There is no information pertaining to the nature and extent of the groundwater resource in this area. Observations suggest that a portion of the surface flow of the upper Clackamas may be substantially augmented by contributions from springs and groundwater supplies.

Anadromous and resident fish inhabit the Clackamas River and its tributaries (Table 2.1). Spring chinook salmon (*Oncorhynchus tshawytscha*), coho salmon (*Oncorhynchus kisutch*), and steelhead trout (*Oncorhynchus mykiss*) use these waters for spawning, rearing, and migration. Resident fish include cutthroat trout (*Oncorhynchus clarki*), rainbow trout (*Oncorhynchus mykiss*), brook trout (*Salvelinus fontinalis*), bull trout (*Salvelinus confluentus*), and mountain whitefish (*Prosopium williamsoni*).

The most important tributaries for anadromous fish production are Roaring River, Fish Creek, Oak Grove Fork of the Clackamas River, Pinhead Creek, Cub Creek, and the Collawash River and its principal tributary the Hot Springs Fork. In addition to these tributaries, anadromous fish currently use the lower reaches of most of the other tributaries to the Clackamas River or have the potential to use available habitat in the tributaries. The tributaries can serve as important spawning areas for coho salmon and wintering areas for juvenile anadromous salmonids. They provide warmer and lower velocity water during the winter months and can serve as areas of refuge from large flood events in the main stem. Resident salmonids inhabit the upper reaches of the mainstem Clackamas and tributaries and they frequently coexist with the anadromous fish in the lower reaches of the tributaries.

The anadromous fishery resources are listed as "outstandingly remarkable values" (ORV) in the legislation incorporating the Clackamas River into the Federal Wild and Scenic River system. The principle reason for including the Clackamas fishery as an ORV was the late-run coho salmon, the last significant wild late-run coho stock remaining in the Columbia River Basin.

In general, the number of anadromous fish returning to the federally designated segment of the Clackamas River has declined. The native winter steelhead and late-run coho salmon have declined to the point of being classified as "stocks of special concern" (Nehlsen et al. 1991.) The late-run coho salmon are at critically low levels. The National Marine Fisheries Service (NMFS) received petitions in 1990 to list the late-run coho salmon under the Endangered Species Act. In 1991, NMFS determined that listing the late-run coho salmon under the Endangered Species Act was not warranted (Federal Register vol. 56, 29553-29554).

The principal reasons for the decline in anadromous fish are overfishing and hydroelectric development. For example, harvest rates on late-run coho salmon have been as high as 80 percent in recent years (Cramer et al. 1991). The resulting 20 percent escapement rate is far below ODF&W's estimate of a 31 percent escapement level needed to sustain the harvest of wild, late-run coho salmon (Cramer et al. 1991). The hydroelectric development affected the fish by causing mortality during upstream and downstream migration, dewatering available habitat in the Oak Grove Fork, and Faraday Dam blocked upstream fish passage from 1917 to 1939. Thus, no anadromous fish reached spawning and rearing areas in the federally designated river segment for 22 years. Loss or degradation of habitat and hatchery practices have also had a negative effect on the endemic runs of anadromous fish returning to the upper river.

Hatchery practices have had a particularly negative effect on the runs of spring chinook salmon. In the early 1900's, a large proportion of spring chinook salmon were removed from the Clackamas River for hatchery production. Hatchery managers removed the fish near the mouth of the Clackamas River and in the federally designated segment near the confluence with the Collawash River. Degree of effect cannot be determined because the total run size at that time was not known.

Stock Management

The Northwest Power Planning Council and ODF&W have prepared fishery management plans for Clackamas River fish stocks. In 1990, the Northwest Power Planning Council approved the Clackamas River, Willamette River Subbasin, Salmon and Steelhead Production Plan. In 1991, the Oregon Fish and Wildlife Commission approved the Clackamas Subbasin Fish Management Plan.

The two plans propose generally the same management strategies and goals for anadromous fish in the Clackamas River (Table 1.2 in Chapter 1). The information in Table 1.2 shows that current escapement for late-run coho salmon and native winter steelhead is far below the desired escapement levels. Whereas, the escapement of spring chinook salmon far exceeds the desired escapement level. The two plans propose to manage the federally designated river segment for natural production and to manage the river downstream of the dams for hatchery production.

Stock management of fish within the designated river segment must comply with the Wild Fish Management Policy. To comply with the Wild Fish Management Policy, ODF&W does not stock hatchery winter steelhead, spring chinook salmon, and coho salmon above the dams. There are a couple of management actions that might not comply with the wild fish policy. The first deals with summer steelhead. ODF&W annually stocks about 160,000 summer steelhead upstream of the dams. In order to comply with the Wild Fish Management Policy, ODF&W assumes that there is no interbreeding with native steelhead and that the resulting summer steelhead progeny do not compete with juvenile winter steelhead.

ODF&W annually stocks about 80,000 catchable rainbow trout in the federally designated river segment or in tributaries to the designated river segment. In the Clackamas subbasin plan, ODF&W states that the stocking program complies with the Wild Fish Management Policy because no introductions of hatchery trout will occur above natural barriers; hence, the native resident trout populations remain genetically isolated from the hatchery trout because of the physical barriers. Also, the fall spawning hatchery fish are not likely to interbreed with the spring spawning wild rainbow trout. ODF&W proposes actions in the subbasin plan to investigate compliance with the policy. In addition, ODF&W assumes that the current stocking program complies with the policy because of the high harvest rate on released hatchery trout and the low overwinter survival to spawning of released hatchery trout.

Management of spring chinook salmon and late-run coho salmon might not comply with the Wild Fish Management Policy. The issue for spring chinook deals with the percent composition that hatchery strays account for of the total escapement over the dams. Prior to the first returns of hatchery spring chinook salmon above the dams was about 500 fish. Starting in 1980 with the first returns to the hatchery, the number of spring chinook escaping to spawning areas upstream of the dams jumped to over 2,500 fish. Based on this information one could assume that the ratio of hatchery to wild fish is 80:20. The policy states that hatchery fish that spawn at the same time and place as the wild population shall comprise no more than 10 percent of the total number of naturally spawning fish. ODF&W has identified action items in the subbasin plan to investigate whether spring chinook salmon management complies with the policy.

For late-run coho salmon, the compliance issue with the policy is competition with the hatchery origin early-run stock. There exists anecdotal evidence that the juvenile early-run stock competes with juvenile late-run stock. In 1971, the ladder at River Mill dam was closed for repair until November 5. Since that time, every third year which corresponds to the life cycle of coho salmon, the escapement of late-run coho salmon above the dams has been the strongest. This suggests that the strong year class of late-run coho salmon resulted from the lack of competition with the early run fish.

In recent years, the Oregon Fish and Wildlife Commission adopted special angling regulations designed to help restore the wild runs of anadromous fish returning to the federally designated river segment and designed to diversify angling opportunities within the basin. In 1989, the Fish and Wildlife Commission changed the trout season opener from late-April to late-May. The purpose of that change was to protect downstream migrating smolts from incidental take during the trout season. The peak migration of anadromous smolts typically occurs in April and May.

In 1991, the Oregon Fish and Wildlife Commission adopted a number of new angling regulations to help restore wild anadromous fish in the Clackamas River. These include:

- release of all non-fin clipped steelhead (all hatchery steelhead have one or a combination of fins removed);
- release of all coho salmon from mid-August to the end of March; and
- barbless hooks only from November 1 through December 31.

The Fish and Wildlife Commission also created a wild trout management area in Big Bottom in 1991. The regulation is catch and release of all trout in Big Bottom. The objectives of the special trout regulations are to diversify angling opportunities within the basin and to protect anadromous and resident fish in the largest continuous segment of prime habitat with the Clackamas basin. ODF&W further supports protection of wild trout in the area by no longer releasing hatchery trout in Big Bottom. The special trout regulations provide good research opportunities on the population dynamics and habitat use of anadromous and resident fish within the main stem Clackamas River.

Current Habitat Conditions

Over 1,040 miles of fish-bearing streams and rivers flow into the Clackamas River. This quantity, plus the 47 miles of mainstem habitat, equals approximately 1,100 miles of available fish habitat either in or directly flowing into the federally designated river segment.

The federally designated river segment contains a diverse composite of fish habitat types. A diversity of habitat conditions is critical to ensure a productive fishery. Due to armoring of banks and in-channel log removal since the turn of the century, it is likely that current habitat conditions reflect a much lower proportion of pool habitat than under "historic" conditions. A major storm event occurred in December, 1964. The 1964 flood was a significant channel forming event. Much of the large woody debris was flushed out of the system, removing much of the pool forming elements in the upper Clackamas River and its tributaries. After the 1964 flood, debris jams and obstructions that caused flooding or that threaten structures such as roads and bridges were removed. This resulted in the reduction of diversity in many miles of the Clackamas River and its tributaries.

Habitat loss and degradation has contributed to the decline in anadromous fish returning to the Clackamas River. Timber harvesting in the upper basin has affected watershed conditions, possibly contributing to increased sedimentation of spawning and rearing areas.

Table 2.1 Fish species and stocks that inhabit the federally designated segment of the Clackamas River.

Common Name	Scientific Name	Stock Origin	Status
spring chinook salmon	<i>Oncorhynchus tshawytscha</i>	Wild/ Hatchery	Increasing
coho salmon early run late run	<i>O. kisutch</i>	Hatchery	Stable
		Wild	Declining
winter steelhead	<i>O. mykiss</i>	Hatchery	Stable
		Wild	Declining
summer steelhead	<i>O. mykiss</i>	Hatchery	Stable
cutthroat trout	<i>O. clarki</i>	Wild	Stable
rainbow trout	<i>O. mykiss</i>	Hatchery/ Wild	Stable
bull trout	<i>Salvelinus confluentus</i>	Wild	Unknown, extinct
brook trout	<i>S. fontinalis</i>	Hatchery	Unknown
mountain whitefish	<i>Prosopium williamsoni</i>	Wild	Stable
sculpin	<i>Cottus sp.</i>	Wild	Stable
reidside shiner	<i>Richardsonius balteatus</i>	Wild	Stable
sucker	<i>Catostomus sp.</i>	Wild	Stable

Uncontrolled recreational use of riparian areas has also contributed to the loss or degradation of aquatic habitat. The most destructive use is driving vehicles into the riparian zones between the roads and the river. Vehicles compact wet soil in riparian zones, thereby preventing regeneration of vegetation and allowing for overland flow, erosion, and sediment input into the river. Aquatic and fish habitat is negatively impacted by people cutting trees for firewood, scarring and killing riparian vegetation, and disposing of human waste adjacent to watercourses.

Road building for access to the upper Clackamas River has probably been the most significant negative affect on habitat. Improperly designed culverts under roads block fish access to historical spawning and rearing areas. From RM 65 to RM 34.8, Oregon State Highway 224 and Forest Service Road 46 constrain the river from meandering. This 30-mile long segment has at least 60 miles of riparian habitat. Of the 60 miles, 24 miles or 40 percent of the river bank is rip rapped. Rip rap is a rock and boulder armoring placed along road edges and culverts to protect them during high water events. Rip rap eliminates riparian vegetation from the armored sections or converts the normal Douglas-fir dominated riparian zone to alder stands. In addition, unpaved roads constructed primarily for accessing timber are probably the primary source of sediment to streams and the mainstem Clackamas River.

Timber harvesting removed some of the potential large woody debris along the Clackamas River. Timber harvest in riparian areas has had the largest negative effect to fish habitat and riparian areas in tributaries to the Clackamas River. Information collected during stream surveys since 1989 show that a majority of stream reaches in tributaries flowing into the Clackamas River do not meet Forest Plan standards for large woody debris and pool composition.

The Forest Plan along with the Policy Implementation Guide and Salmon Summit commitments direct the Forest Service to manage for improvement in anadromous fish habitat and to increase the habitat capability for smolt production. The emphasis of current habitat improvement efforts is the restoration of populations of native resident and anadromous salmonids in a manner which compliments the subbasin plans prepared by ODF&W. As discussed in the section on Stock Management, ODF&W manages the federally designated river segment for natural production under the Wild Fish Management Policy.

Since the early 1980's the Forest Service has taken aggressive action on restoring fish habitat in the mainstem Clackamas River and its tributaries such as Fish Creek and the Oak Grove Fork. A lot of the work has been done through partnerships with the Bonneville Power Administration.

In 1988 and 1989, the Forest Service implemented a fish habitat improvement project from the confluence with the Collawash River upstream about eight miles to the downstream end of Big Bottom. The objective of the project was to improve riverine habitat negatively affected by the construction of Road 46. The project resulted in adding numerous log-boulder complexes, boulder complexes, and two side channels (total length about 0.5 miles) to the habitat. Monitoring results show that the side channels contain some of the highest densities of juvenile anadromous fish in the Clackamas River.

Fish Habitat Utilization

The Clackamas River contains six zones of fish habitat use. Anadromous fish primarily use the zone from RM 34.8 to RM 51 as a migration and resting area. Also, the same stretch of river contains important spawning and rearing areas for juvenile anadromous fish, resident trout, and mountain whitefish. The large deep pools serve as holding areas for adults and juvenile anadromous fish moving downstream would use the margins of the river through this stretch as rearing and holding areas. These large pools provide excellent habitat for suckers and whitefish.

The zone from RM 51 to RM 57 contains the most heavily used spring chinook salmon spawning gravel in the Clackamas River basin. The newly emerged spring chinook fry concentrate at the margins of the wide shallow riffles in this area. They do so until they begin dispersing to more preferred habitats.

The zone between RM 57 to RM 65 provides a diversity of habitat types, including frequent cascades with small pockets of spawning gravel. Juvenile spring chinook and coho salmon, juvenile winter steelhead, and resident cutthroat and rainbow trout are frequently seen in this zone. The heaviest concentrations of fish occur near large woody debris in the channel and in the side channels.

Big Bottom (RM-65-72.8) contains some of the most diverse and complex habitat in the Clackamas River. The interspersed braided channels and frequent accumulations of large woody debris (LWD) create complex habitat. Big Bottom provides excellent large pools for holding adult anadromous fish and contains tremendous amounts of spawning gravel. The frequent concentrations of large woody debris provide excellent rearing habitat for resident and anadromous fish. Big Bottom reflects the habitat condition of the Clackamas River prior to constructing the highway along the river and pre-1964 flood conditions. The Big Bottom area serves as a source for developing fish production capability values and as a standard to evaluate future projects and success of Forest Plan implementation.

Steelhead and resident cutthroat trout are the dominant fish species in the zone from RM 72.8 to 79.0. These species dominate in this zone because of the increased gradient, frequent cascades and slack water behind large rocks in the channel. These habitat conditions favor juvenile steelhead and cutthroat trout over spring chinook salmon and coho salmon. There is also a fairly complex habitat associated with the cedar-dominated, unconstrained area near RM 75.

Resident cutthroat trout and brook trout use the zone from 79.0 to 81.4. This zone is above the falls at RM 77.3 that blocks anadromous fish passage to the upper reaches. The river contains complex habitat similar to that in Big Bottom. There are frequent side channels and beaver ponds.

Coastal race cutthroat trout are the predominant fish in tributaries to the mainstem Clackamas River. Resident rainbow trout also occur in the tributaries but cutthroat trout are the most numerous and occur highest up the drainages. Cutthroat trout can occur in small first order streams that flow at less than one-half cubic foot per second in streams less than 2 feet wide.

Opportunities

Due to flow conditions, stream gradient, and negative effects from the presence of Road 46, areas between RMs 57 and 65 have high potential for improving fish habitat. Much of the effects of the road could be mitigated in the short-term by constructing side channels and introducing or reconfiguring large woody debris and boulders. There are numerous opportunities to reconnect the wetlands and historical side channels to the river in this eight-mile stretch.

Dispersed recreation use near the river has degraded riparian conditions to the extent that they negatively affect fish habitat, water quality and fish production. With rehabilitation, these sites could become a positive influence on fish habitat and fish production in the future. Most of the severely degraded sites occur between RM 57 and 65. One of the largest sites is situated just northwest of the 4670 bridge.

Fish habitat in other reaches (e.g., near Lemiti Creek) would benefit from the addition of large woody debris into the channel. This assists in creation of pools, provides velocity breaks, and serves as cover for fish.

On a landscape scale emphasis, there are numerous opportunities to restore small watersheds. The restoration effort would include instream habitat work, replacing or removing culverts that affect fish passage, revegetating and stabilizing exposed soil areas, and eliminating unnecessary roads that contribute sediment to the channels.

Other opportunities in the basin include fish viewing, environmental education focusing on fish and riparian interactions and values, and interpretive trails and kiosks. The fish viewing would consist of a viewing station overlooking a heavily used area by spawning spring chinook salmon. Interpretive opportunities include developing a self guided interpretive trail through Big Bottom emphasizing fish habitat and riparian-floodplain interactions.

Recreation and Public Use

Current Visitor Use Facilities, Services, and Settings

Whitewater boating, sightseeing, photography, fishing, camping, and hunting are some of the many recreation opportunities available along the Clackamas River corridor. The scale and level of recreation development and use generally decreases as one moves upstream from Estacada, except for Indian Henry campground. Recreation use is heaviest in the summer season, with active spring and fall weekend use. Winter and weekday use is relatively light. The following describes the facilities and settings contributing to the character of recreation opportunities along the Clackamas, as well as a more in-depth description of types and levels of recreation use in the corridor. Because some areas outside, or downstream of, the designated river corridor often contribute or complement the facilities, services, and opportunities within the corridor, they are included in the following.

A variety of visitor facilities, services, and recreation settings are available in the corridor, including campgrounds, picnic areas, trails, various levels of river and forest access, administrative/information stations, use regulations and enforcement, commercial recreation providers, interpretive programs and materials, and environmental education opportunities.

Campgrounds and Picnic Areas

There are 14 developed campgrounds in the designated river corridor, varying in size from eight to over 80 campsites. Facilities are typically in fair to good condition, although there are opportunities to enhance function, resource condition, and river access. Many smaller sites are not designed for use by oversized vehicles. Barrier-free accessibility is considered fair to poor.

There are currently three developed picnic areas in the corridor, although picnicking occurs in many other areas, including developed campgrounds. Maintenance of several sites is minimal, and major redesign of these areas would be required to achieve design capacity.

Big Bottom



Trails and Trailheads

Six trails lie within, or can be accessed from the designated corridor. The Clackamas River Trail (#715), Alder Flat Trail (#574), and Riverside National Recreation Trail (#723), provide direct access to major portions of the Clackamas River and are in relatively good condition. Other trails accessed from the corridor include Cripple Creek Trail (#703), and Dry Ridge Trail (#518). A segment of the Lodgepole Trail (#706) crosses the Clackamas in its upper reaches, and a short section of the Pacific Crest Trail (#2000) passes within close proximity to the headwaters area.

Trailhead facilities for the Clackamas River Trail are located at Fish Creek and Indian Henry. Trailhead facilities for the Riverside National Recreation Trail and the Dry Ridge Trail consist of parking areas within campgrounds at either end of the trail (Rainbow and Ripplebrook campgrounds, and Roaring River campground, respectively). There are several proposals to separate camping and trail access by relocating trailheads. The Cripple Creek trail has its own trailhead that is unusually large for the trail's level of use.

A separate planning process is considering possibilities for an Urban Link trail which would connect Portland area trails to the Pacific Crest Trail. The trail would lie in the river corridor for part of its length. The alternate routes being considered diverge from the corridor at various locations including Roaring River, Cripple Creek, Collawash River, Burnt Granite or Cub Creek.

Forest and River Access

In addition to the trails system, varied levels of forest and river access are provided in the corridor. Corridor roadways provide a variety of driving experiences, and are discussed in the Access and Travel Management section. Dispersed boating access is facilitated through close proximity of roadways to the river. Some improvements have been made to a popular rafting put-in area near Sandstone Bridge. A graveled boat launch area, with parking across the road at Memaloose Scaling Station, serves as a convenient take-out facility. There are no boat launches designed for trailer use within the designated corridor.

Winter access beyond Ripplebrook varies by location, snowload, plowing for administrative and commercial activities, and level of use. There are no sno-parks in the corridor. In some years, Olallie Resort operators have provided winter transportation to the resort via snowcat.

Dispersed Use Areas

Forest roads provide access to numerous recreation areas that are neither formally designated nor developed. These are often referred to as "dispersed sites" or "dispersed use areas." The soil and vegetation have been heavily damaged in some of these areas; several are located very close to the river. Some use occurs in the Austin Hot Springs area as well. It is unknown whether this use has been authorized by the owner. Hot springs guide books continue to describe this site as it was prior to private purchase.

Administrative and Informational Services

Administrative and informational services relevant to the corridor are provided at both the Estacada and Ripplebrook Ranger Stations. During the summer season, Forest Service personnel are also stationed at the Olallie Guard Station at Olallie Lake. Information concerning corridor resources is also available at various outlets in local communities, the region, and nationwide. Information is also provided to various publishers wishing to feature corridor attractions in the local news media, recreation guides, maps and books.

Interpretation and Environmental Education

Interpretive programs are provided in the summer months at Indian Henry Campground, the Olallie Lake area, and from time to time at various locations in the corridor. Currently, the only proposals for interpretive development are for the Big Eddy picnic area, and Alder Flat Trail. Easy access, and a rich and diverse landscape, combine to create a multitude of interpretive opportunities in the corridor. A corridor-wide interpretive strategy is being developed through this planning process.

Environmental education activities occur at various locations throughout the corridor, including Alder Flat Trail and the Oak Grove drainage, mostly on an informal, user-initiated basis. The Forest Service is currently working with other organizations and agencies on a proposal to develop an environmental learning center at Three Lynx School. The Alder Flat Trail, Riverside Trail, and the Big Bottom area are sited in several publications and visitor pamphlets as being good places to view old-growth forests.

Use Regulation and Law Enforcement

Forest Service personnel cooperate with the Clackamas County Sheriff and the Oregon State Police to enforce federal and state laws and regulations in the corridor, and to provide emergency response services. Typical calls relate to firearm use, assault, property damage, and recreation-related emergencies. Demands on law enforcement personnel are increasing, with an increasing proportion of calls related to violent crimes and/or alcohol-related incidents.

Currently, general federal restrictions address use of firearms, protection of property and resources, and various rules for occupancy and use of Forest Lands. Restrictions specific to the corridor include a prohibition of camping between Highway 224 and the river (Forest Boundary to Sandstone Bridge) and prohibition of horse use on the Riverside National Recreation Trail. State regulations prohibit motorized use of the river above North Fork Reservoir.

Special use permits for commercial recreation providers and for recreational events in the corridor are provided through the Estacada Ranger District office.

Commercial Recreation Providers

At the time of federal designation (1988), three rafting companies operated under temporary permits on the river. The policy at the time, as authorized in a 1982 decision, was to issue permits on an as-requested basis. Since designation, there have been requests from other companies for new permits on the river. Interim District policy has been to renew only those permits that were active at the time of designation, on a temporary basis.

Various other commercial recreation uses occur in the corridor, including tours. It is also suspected that there are several commercial recreation operations using the corridor without a permit.

Recreation Settings

The Recreation Opportunity Spectrum (ROS) is a management and planning tool used by the Forest Service to inventory, manage and plan for the provision of a variety of recreational "settings" on National Forest lands. Land classifications within the Spectrum vary from "Urban" to "Primitive," with the selected category based upon a combination of levels of access, remoteness, naturalness, facilities and management, numbers of persons typically encountered, and impact levels. The ROS has been applied to the river corridor as defined in the Forest Plan (one-quarter mile each side of the river), but is not generally applied to other lands in the drainage. ROS classifications assigned to the corridor through the Forest Plan consist of the "Semi-Primitive Non-Motorized" (SPNM) or "Semi-Primitive Motorized" (SPM) in Scenic river segments, and "Roaded Natural" (RN) in Recreational river segments.

Note: "Motorized" here refers to land vehicles since motor boats are not permitted by state regulations on any portion of the river upstream of North Fork Reservoir.

There are several locations within the corridor that do not conform with the ROS settings assigned in the Forest Plan, both due to the general nature of the ROS framework, and to current levels of access, development, use, impacts, and controls. The Spectrum can provide a base from which to refine and apply these criteria to best meet the management goals of an area. This Assessment and Plan will result in a ROS tailored specifically to the resources, uses, issues, and opportunities in the designated river corridor.

Public Use

Levels, locations, types, and characteristics of public use in the corridor were documented in the summer of 1991, using traffic counts, literature reviews, observations, interviews, and distribution of a response form to all recreationists found in the corridor on three different days in the summer. Collection and recording were tailored to correspond to both Forest Service and Oregon State Parks recreation data activity categories, to allow comparison and integration with State recreation demand projections. Data collection is continuing, but on a less intensive, as-needed basis.

Overall levels of visitation can be inferred through traffic counts. According to monitoring done in 1991, approximately 1,100 vehicles travel Highway 224 into and out of the Forest on an average summer day. Typical weekend traffic levels (1,700 vehicles) are twice as high as weekday levels (900). Holiday weekend levels average about 10 percent higher, and spring and fall levels are about 27 percent lower. Overall traffic activity levels show a marked change up river from the junction of Forest Roads 46 and 57, where average summer traffic levels are approximately 750 trips, or 30 percent of typical traffic at the Forest boundary. Another change occurs at the 46/4690 junction, where average daily traffic on Forest Road 4690 is less than 100 trips, or four percent of levels at the Forest boundary.

Total use during a three-day period in August of 1991 averaged 70 percent camping-based activities, and 30 percent day use. Of total weekend use, approximately two-thirds occurred in developed sites, with the remainder occurring along the roadways and in dispersed use areas.

Carrying Capacity

The Wild and Scenic Rivers Act requires the determination of "carrying capacity" of river areas. This term can be broken into several components: physical (the ability of an area to physically contain/support specific activities), biological (the ability of an area to support activities without unacceptable resource damage), and social (the ability of an area to provide opportunities that meet visitor expectations on a variety of levels).

The concept of "Limits of Acceptable Change" (LAC) adds flexibility to carrying capacity determinations, both in application, and in revision over time. The process used in this Assessment and Plan combines these methods to document current conditions and to suggest future management direction. Table 2.3 lists the factors contributing to the corridor's ability to accommodate public use, and its current status relative to those factors. Asterisks (*) denote factors considered to be limiting on capacity at present; crosses (+) denote factors that would likely be critical capacity thresholds, if current limitations were removed.

Table 2.2 Factors Influencing Corridor Carrying Capacity

Activity	Current Capacity	Current Use Level	Ability to Support Additional Use
Fishing			
Freshwater, Boat: Relevant Factors -- boat launch availability*; sufficient river depth; potential conflicts with other on-river users+; fishing regulations.	very low	negligible	moderate
Freshwater, Bank: Relevant Factors -- Anadromous: number of fish returning, parking* and access, relative solitude+, stocking (steelhead).	moderate	moderate	moderate
Resident Trout: Stocking levels, ease of access to holding areas, catch rates, competition of stock species with wild populations+.	moderate	moderate	low-moderate
Boating			
Non-Motorized, River Relevant Factors - Kayaking/Canoeing: Miles of boatable river available, flow levels, number of "play areas", diversity of challenge levels, length of runs available, on-river waits required for other boaters+, parking, travel time, solitude, availability of substitute areas.	moderate	variable	moderate
Rafting, Commercial: Required wait at put-in, water temperature, early season, parking capacity at put-in, availability of outfitters, allowed use levels+.	moderate	low-mod	unknown
Rafting, Private: Skilled: favorable flows*, required wait at put-in, availability and use of other put-in areas, number of encounters on the river+.	moderate	low	unknown
Other activity-associated: Weather and water temperature*, ability to launch near activity site, enough flow to float, parking, impacts to other users+.	moderate	low	moderate
Nature/Wildlife Observation			
Relevant Factors: Access to "observable" resources, information/viewing aids*, level of "intrusions" (noise, wildlife harassment, crowding)+.	low-mod	low	high
Using Interpretive Materials/Developments Relevant Factors: Availability of interpretive materials/programs/developments*, administrative cost to provide programs/display space at visitor areas+, level of promotion, litter or perceived "clutter."	low	low	high
Hiking			
Day: Variety of opportunities*, multi-user conflicts+.	moderate	low	moderate-high
Overnight: Long distance trails*, associated camping opportunities, level of intrusions, multi-user conflicts+.	low	negligible	high

Activity	Current Capacity	Current Use Level	Ability to Support Additional Use
Camping (in campgrounds)			
RV:			
Number of units w/needed spur length*, ease of access into and within campground, disposal stations, effects on other users, areas available for new development+.	low-mod	above capacity	limited
Tent:			
Number of units*, unit spacing, level of intrusion, variety of opportunities available from campsite, areas available for new development+.	moderate	above capacity	limited
Walk-in:			
Availability of walk-in units	low	moderate	moderate
Fishing Related:			
Number of units*, river access+, catch rates/stocking, areas available for new development.	moderate	moderate	limited
Equestrian:			
Availability of sites, related trail opportunities*, potential multi-user conflicts+.	low	negligible	moderate
Informal Use Areas:			
Spur road, ability to access site, size necessary to maneuver in site, soil compaction and resource damage*+.			
Motorized Off-Road Riding/Driving			
Relevant Factors:			
Availability of unpaved riding areas*, potential for encountering oncoming traffic, impacts of noise and dust levels on other users+.	low	low	limited
Bicycling			
On-Road:			
Width of bicycle lane*; speed, frequency, and proximity of roadway traffic+; scenic variety; physical challenge.	moderate	low	moderate
Off-Road:			
Availability and awareness of safe riding areas*, opportunities for loops, multi-user conflict+, accelerated rutting and erosion.	moderate	low-mod	moderate
Horse Riding			
Relevant Factors:			
Needed clearance, staging areas, interconnected opportunities*, multi-user conflicts+.	low	low	moderate
Sightseeing/Driving For Pleasure			
Relevant Factors:			
View from roadway, roadway-related interpretive development*, driving experience (speed, congestion, oversize vehicles, passing opportunities, etc.)+.			

Activity	Current Capacity	Current Use Level	Ability to Support Additional Use
Hunting			
Big Game Relevant Factors -- roadway access*, species available, relative solitude, affects on populations+.	moderate	low-mod	moderate
Birds	low	moderate	moderate-high

* = current limiting factor

+ = expected critical use threshold factor



Carter Bridge

Expected Demand

In 1987, Oregon Parks and Recreation Department participated with Washington and Idaho in the Pacific Northwest Demand Survey. This effort was intended to document the types, location, and frequency of recreation activities pursued, and to project future trends. The survey incorporated the ROS concept, by asking respondents what type of setting they currently used, as well as their preferred setting. The results formed the basis of the Oregon Statewide Comprehensive Outdoor Recreation Plan (SCORP).

Most popular recreation activities cited by Oregon residents were "picnicking" (67 percent of households participating), and "hiking, walking, climbing" (66 percent). More than half participate in fishing, and about half say they participate in nature study and sports/games. Remaining activities, in order of participation levels, were water activities, camping, hunting/shooting, off-road driving, bike or horse riding, and snow activities.

For almost all activities, it was found that people preferred a setting less developed than what they typically visited. It is these more "primitive" settings that are declining in supply most quickly (through conversion, development, allowed landform disturbance, overuse, etc.).

Regional information was collected for eight different regions in Oregon, each defined by a grouping of counties. The Clackamas River is within SCORP Region 7 (Columbia, Washington, Multnomah, and Clackamas Counties). Table 2.4 lists the results of the Survey for Region 7, for a selection of activity categories relevant to the Clackamas. The first column of numbers is the expected percentage increase in recreation participation in Region 7 over a 10 year period. The second column lists the percentage of Region 7 participants preferring a highly "natural" setting.

Table 2.3 Regional Recreation Demand SCORP Region 7

Activity	10-Year Projected Increase	Percent Preferring Semi-Primitive/ Primitive Settings
Fishing		
freshwater, boat	48%	37%
freshwater, bank	16%	59%
Boating		
river, non-motor	15%	67%
Nature/Wildlife Observation	40%	43%
Visits to Interpretive Centers	70%	NA
Day Hiking on Trails		
Overnight Hiking on Trails		
Camping		
RV	42%	33%
tent with motorized vehicle	27%	75%
horseback without packstock	6%	NA
Motorcycling Off-Road	38%	0
ATV Driving Off-Road	35%	0
Bicycle		
riding on road	80%	6%
riding off-road	29%	50%
Horseback Riding	67%	33%
Picnicking	27%	11%
Sightseeing	45%	33%
Hunting		
big game	26%	50%
birds	2%	100%

Wildlife

The above projections assume a 1.2 percent increase in state population per year, similar to projections for the Portland metropolitan area.

Riparian and upland habitats within the Clackamas River corridor support diverse communities of birds, mammals, amphibians and invertebrates. Riparian area stands of old-growth Douglas-fir, western hemlock and western redcedar provide valuable and increasingly rare habitat for many species, including the northern spotted owl. Other key wildlife species that inhabit the corridor include Rocky Mountain elk, pileated woodpecker, pine marten, osprey, bald eagle, river otter, beaver and riparian-associated amphibians.

Management Indicator Species

The Management Indicator Species approach is based on the concept that by managing for the habitat requirements of a few carefully chosen species, several other species with similar habitat needs can be accommodated. Table 2.5 summarizes the Forest-wide Management Indicator Species (MIS) and habitat types present within the Clackamas River corridor.

Table 2.4 Management Indicator Species for the Clackamas River Corridor

Species	Rationale	Habitat Type	Description
Rocky Mountain elk	Economic importance	Grass/forb shrub/sapling mature/OG	Numbers and condition improving
Blacktailed deer	Economic importance	Grass/forb shrub/sapling	Numbers and habitat condition improving
Pileated woodpecker	Requires snags and down material	Mature/OG slash, snags	Numbers and habitat condition declining
Pine marten	Requires snags and down material	Mature/OG slash, snags	Numbers and habitat condition declining
Spotted owl	Federally listed, requires OG/mature	Mature and old-growth forest	Numbers and habitat condition declining

Current Management Status for MIS Species

Habitat management areas for pileated woodpeckers and pine martens were established in the 1990 Forest Plan. Five woodpecker areas at 600 acres each, and nine pine marten areas at 320 acres each, were delineated within the Clackamas corridor. (A correction is needed to add a pine martin area within the corridor which was mistakenly left off the original Forest Plan map.) The Clackamas and Estacada Districts have initiated a survey program for pine marten. Pine marten are known to be relatively abundant in the upper reaches of the Clackamas drainage (Olallie area), while pileated woodpeckers are frequently observed throughout the drainage, but especially near Ripplebrook.

Threatened, Endangered and Sensitive Species Overview

Prior to human modification of the old-growth forests, deer and elk were probably not numerous within the corridor because of limited forage. Clearcut harvesting in the drainage, which began in the 1950's, initially created a mosaic of forage openings surrounded by optimal old-growth cover. The current black-tail deer population within the Clackamas watershed is estimated at approximately 9,500 animals (G. Herb, ODFW, personal communication, 1992). Elk populations remain at relatively low levels; probably fewer than 1,500 inhabit the entire drainage.

Nearly the entire corridor is considered winter range for deer and elk. A cooperative transplant program involving the Mt. Hood National Forest and ODFW was initiated in 1989 in hopes of increasing elk numbers within the drainage and establishing a self-sustaining resident herd. Under the agreement, 20 to 50 elk would be transplanted from Jewell Meadows (an ODFW refuge in the Oregon Coast Range) to the Clackamas drainage each year for a 10-year period.

Spotted Owl

The northern spotted owl is dependent on contiguous mature and old-growth coniferous forests. The owl is listed as an Endangered species by the State of Oregon and as Threatened by the U.S. Fish and Wildlife Service. Eighteen pairs of spotted owls are known to occupy old-growth forest habitat within the Clackamas watershed. Of these, five are located within the one-quarter mile interim corridor. Current direction requires that management of spotted owl habitat be consistent with the Final Environmental Impact Statement on Management for the Northern Spotted Owl (USDA, 1992).

Bald Eagle

The bald eagle is listed by the USFWS and ODFW as a threatened species in the state of Oregon. At present, there are no known bald eagle nests in the corridor; however, potential nesting habitat is available. Eagles are occasionally observed within the corridor, primarily in the winter months. A specific land allocation (A13) was developed in the Forest Plan for protection of potential bald eagle habitat, consistent with the requirements of the Pacific Bald Eagle Recovery Plan (USFWS 1986). Three of these bald eagle "recovery areas" are located within the corridor, one in the Alder Flat area and two at the extreme downstream end of the corridor near Big Cliff. A forest-wide bald eagle management plan is to be developed within the next two years.

Peregrine Falcon

The only federally listed Endangered species present on the Forest is the peregrine falcon. Two nesting pairs were discovered on the Forest in the spring of 1990; neither was nesting in the corridor. The corridor has potentially suitable nesting habitat. Hacking programs (reintroduction of young peregrines to an area) have been successful in the Columbia River Gorge, and could work in the corridor. A forest-wide peregrine falcon management plan, consistent with the USFWS 1982 Peregrine Falcon Recovery Plan, is to be completed within two years of completion of the Forest Plan.

Riparian Obligates

Sensitive Species

The Clackamas River Corridor may contain habitat for the following species: wolverine, sandhill crane, Pacific western big-eared bat, white-footed vole, harlequin duck, red-legged frog, Cope's giant salamander, painted turtle, and Northwestern pond turtle. Some of these species have undergone marked declines in the last several decades due to loss of suitable habitat or predation. Others are naturally rare (from all known accounts) or are uncommon here but relatively abundant elsewhere.

Of these species, only the sandhill crane, harlequin duck, red-legged frog, Cope's giant salamander, painted turtle, and Northwestern pond turtle are considered dependent upon riparian areas (streams, backwaters, wet meadows, deciduous riparian forest and floodplain old-growth forest) for all or part of their life cycle. Sandhill cranes and red-legged frogs have been found breeding in the corridor; occurrences of the other riparian dependent sensitive species have not been confirmed in the corridor.

The state of Oregon lists many more species as "sensitive;" many of the species on the state's list are amphibians (spotted frog, cascade frog) or mammals (fisher) that are closely associated with riparian areas. Records of these species in the corridor are relatively few, but habitat undoubtedly exists.

The riparian habitat directly adjacent to the river provides a unique and scarce habitat type. In addition, the relatively easy visual and physical access to these areas contributes to excellent interpretive opportunities.

Osprey

The osprey nests along rivers, lakes, and seacoasts where tall vertical structures serve as nest and roost sites, while the waters below provide fish, the osprey's principal food. Along the Clackamas, osprey nests are located in large diameter snags immediately adjacent to the river. Nest sites, including two to three alternate nest trees and several fishing perches, are used year after year. Additional, alternate nest trees close to the current nest are an important resource, since the bulky, exposed stick nests are frequently lost during storms or high winds. There are five known osprey nests within the corridor, and three additional nests close to the corridor boundaries. State-wide populations of ospreys appear to be stable or increasing (R. Goggans, ODFW, personal communication, 1992).

Otter and Beaver

Two key species, the river otter and the beaver, are entirely dependent on the terrestrial/aquatic interface of the riparian zone. The beaver, which may den either in dams or in bank burrows, depends on streamside shrubs and trees for both food and building materials. Otters enlarge the dens of other species for their own use, and forage in the water for fish, crustaceans and fresh-water mollusks.

Once common, both otter and beaver declined drastically throughout the Pacific Northwest during the fur trading days of the 18th and 19th century. Beavers, considered a nuisance for their tree-felling and dam-building habits, were trapped, moved or destroyed for several decades. Today the species is recovering in much of its former habitat. Along the Clackamas, beaver are locally common, particularly in the Alder Flat and Big Bottom areas. Little is known regarding the status of otter populations in the Clackamas drainage. To date, no surveys have been conducted to establish baseline population densities for otter or beaver in the Clackamas corridor.

Habitat Conditions

Amphibians and Reptiles

Many species of amphibians and reptiles, including salamanders, frogs, turtles, lizards and snakes, inhabit the Clackamas River drainage. Within the corridor, there are several riparian-associated species. With the exception of common frog species such as the Pacific tree frog, many of the local amphibian species are considered "sensitive."

Old-Growth Habitats/Fragmentation

Although fragmented to some degree, old-growth habitat within the corridor and portions of the area seen from the river are still functional and vitally important to the stability of old-growth associated species.

Re-establishing "connectivity" and function among old-growth stands has become a silvicultural priority in many fragmented forest landscapes. Techniques for "creating" old growth from plantations are thought to be feasible by regional silviculturists (Debell, et al., 1990). These practices may include thinning young trees to wide spacings, diversifying Douglas-fir monocultures with underplantings and natural regeneration.

Coarse Woody Debris

Down logs serve as important wildlife habitat, as well as providing nutrient and water cycling services to forested ecosystems. Down logs and standing dead trees (snags), are abundant in some areas of the corridor, especially undisturbed old-growth areas. Young plantations have relatively few down logs or snags.

Wetland/Meadows

Forested and non-forested wetlands and wet meadows (such as those found in the Big Bottom area) interspersed among forest stands ranging from new plantations to mature trees and old growth create a mosaic of canopied and open habitats along the corridor. The natural edges and diversity of plant communities result in a complex and species-rich system. Many of the sensitive species discussed above use these ecosystems.

Plantations

The corridor includes numerous young plantations. Clearcut-harvest and burn techniques have largely replaced wildfire as the primary mechanism for creating and maintaining openings. Seeded clearcuts may provide excellent short-term forage resources for early-successional species; black bear, deer, elk and several early-seral bird species (mostly ground-feeders and ground-nesters) find rich food resources in recently cut and burned areas, and may use these areas heavily. As the new plantations close in, however, dense young trees shade out the sun-loving herbaceous vegetation, and the forage resource is lost. As they grow, plantations provide hiding and thermal cover for deer and elk and nesting habitat for many songbirds. Species that rely upon down logs (especially small mammals and salamanders) may or may not be present, depending upon the level and type of down material present in the stand. Snag utilizers are also usually absent.

The river corridor encompasses a diversity of vegetation types and habitat. Botanical and ecological values along the river include the high elevation mixed conifer headwaters, and the lower elevation old-growth Douglas-fir communities. These old-growth Douglas-fir communities represent historic late successional forests that are ecologically complex and increasingly less common along major Cascade river corridors. A definition of old-growth forests is found in Pacific Northwest Research Station Note PNW-447 (USDA, 1986). Nationally and regionally important populations of indigenous plant species are found within the river corridor. Species considered to be unique and populations of federal or state, endangered, threatened, candidate or sensitive species are of particular importance.

Species and habitat data within the Clackamas River drainage were obtained from various sources. An inventory of plant communities was conducted on the river in the summer of 1991. In addition, agency botanists and the Oregon Natural Heritage Database provided data on existing threatened, endangered and sensitive plant populations. The Plant Association and Management Guide for the Western Hemlock Zone (USDA, 1986), and the Plant Association and Management Guide for the Pacific Silver Fir Zone (USDA, 1982) were also consulted. These inventories provide a general overview of the river's botanical resources. Additional baseline information of a more site-specific nature would be gathered as projects are proposed in the corridor.

The river corridor is composed of a mosaic of riparian, wetland and upslope non-riparian plant communities. The upper reaches of the river are a mixture of true fir and lodgepole pine forests, hardwood and shrub communities, and high elevation snowmelt meadows. At the 3,500 ft. elevation, Douglas-fir and western hemlock predominate, with western redcedar occurring in the wetter sites. Streamside alder (*Alnus rubra*, *A. sitchensis*), vine maple (*Acer circinatum*), bigleaf maple (*Acer macrophyllum*), and black cottonwood (*Populus trichocarpa*) communities occur throughout the drainage.

Areas considered to represent special or unique ecological habitats include the rock outcrop, cliff and talus plant communities along the drier upslopes, and the Big Bottom area. The upslope cliff habitat contains patches of Oregon white oak (*Quercus garryana*) which support a more unique mix of associated plant species. The Big Bottom area is a diverse ecosystem containing numerous meandering braided streams and associated gravel bars and islands. The habitat is characterized by thin litter and overlying silt and sand interspersed with cobbles and occasional boulders. Many plant species are found here, including cold water corydalis (*Corydalis aquae-gelidae*), which is a sensitive species and a candidate species proposed for federal listing. This population represents the largest concentration of the historic plant community on the Clackamas River. This species requires cool water and much shade. Roadbuilding and other activities have significantly reduced populations of this species along the Clackamas River corridor. Other communities such as willow-sedge (*Salix spp.*, *Carex spp.*) are found along the stream edges. The stream banks above Big Bottom include scattered Engelmann spruce (*Picea englemannii*), mountain alder (*Alnus incana*), and a wide array of other species.

See the Appendix for the Mt. Hood National Forest (Clackamas and Estacada Ranger Districts) Sensitive Plant list for 1992. The lists contain species that are assumed or known to exist in the Clackamas River corridor. For a full definition of the status codes, refer to the publication "Rare, Threatened, and Endangered Plants and Animals of Oregon" (Oregon Natural Heritage Program, 1991).

The Congressional Record at the time the Clackamas was designated listed seven sensitive plants based on an old plant list. Currently only one plant in the corridor remains on the list: cold water corydalis (*Corydalis aquae-gelidae*).

Cultural Resources

Even though human use and density would have been very low, it is possible that earliest use within the upper Clackamas River drainage dates between 14,000 and 11,000 years ago. Pre-historic use by American Indians is based on a limited number of historic accounts from ethnographers and travelers that were compiled after the traditional lifestyles were altered through contact with Euro-Americans. Through these accounts, it was learned that the principal users of this river area were the Clackamas and Molalla peoples. Archaeological evidence supports the assumption that these peoples and their predecessors used the area principally for food gathering. This use continued into the historic time period until it was virtually eliminated around the beginning of the twentieth century.

Early use of the river by Euro-Americans was probably confined to the areas downstream of Estacada. Trappers and miners were the first to make extensive use of the upper reaches of the river in the late 1800's. Homesteaders followed but with few exceptions were confined to the lower Clackamas. With the establishment of the National Forest system, the first permanent presence along the upper river was the Forest Service. Hydro-electric projects and logging also had major impacts within the drainage. Both began almost simultaneously along the upper river at the beginning of the 1920's. A railroad was completed and a town and powerhouse was established at Three Lynx. The railroad provided a means of getting logs from the woods to the lumber mills down river. As a result, the first logging operation in the upper Clackamas began in 1923, just south of the North Fork of the Clackamas River. By the late 1930's the railroad to Three Lynx had been replaced by a truck road. World War II brought the start of the so-called modern era of logging to the area. After the war, logging continued to the headwaters of the river. With the opening of more roads, recreational use increased and campgrounds were constructed along the river's banks. Today, logging continues within the forest, but along the upper Clackamas River corridor, recreational use is ever increasing.

Cultural Resources Survey and Documentation

An archaeological survey was conducted within the boundaries of the Wild and Scenic River Corridor during the fall of 1991. Nearly 100 prehistoric and historic sites were found along the 47-mile length of river. Previously known and recorded sites place the total number within the corridor, above 110. This figure in no way reflects the exact number of sites that may exist in the corridor nor does it give a complete picture of human use of the corridor. There is a high probability that additional sites are present and would be discovered in the future. Out of the total number of sites found, 17 were historic and approximately 80 were prehistoric.

The prehistoric sites consist mainly of, but are not limited to, "lithic scatters" and human modified trees (such as peeled cedars, springboard notches, etc.). One site formally evaluated with a data recovery project was determined to be a lithic reduction area. Although not formally documented, it is suspected that site degradation is occurring in the corridor, which is both natural and human-caused.

The historic sites fall primarily into three categories: railroad/road building, hydro-electric facilities and old Forest Service facilities. Until formal evaluations have been completed, all of the historic and prehistoric sites are regarded as significant and eligible for inclusion on the National Register of Historic Places.

American Indian uses within the river corridor have not been fully documented. It is likely that these uses are limited to informal berry gathering in the area of the headwaters of the Clackamas and infrequent fishing along the entire length of the river.

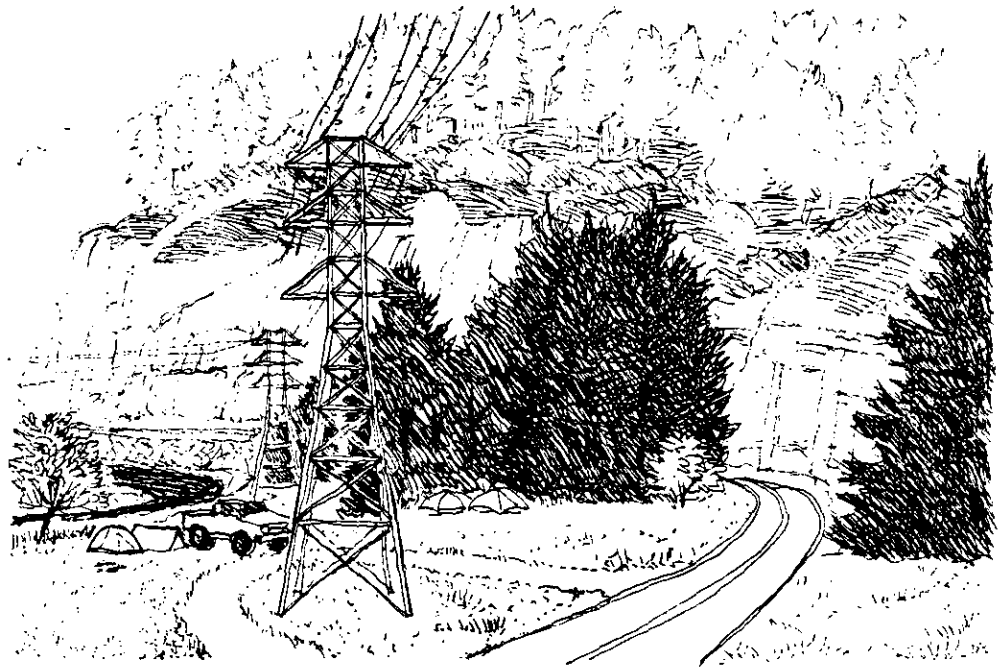
Scenic Resources

The scenery of the Clackamas River Corridor is typical of other major rivers that flow from the west slope of the Cascade Mountains, including the Salmon, Santiam, North Umpqua, and others. Features that these rivers share include dense, lush conifer forests dominated by mature Douglas-fir and western redcedar, riparian flats with groves of cottonwood and red alder, beaches of river-rounded cobbles, rocky openings on south-facing bluffs, and huge volumes of water cascading through narrow canyons. The Clackamas is mostly natural appearing, but a combination of highway construction, power lines, recreation development, and timber harvest have altered the scenery to some extent. The river was divided into five sections for purposes of the scenic quality analysis.

Forest Boundary to Indian Henry Campground

Starting at Big Cliff, the scenery is dominated by very steep, sometimes vertical basalt rock outcroppings. The south facing slopes are a mosaic of mature Douglas-fir groves, maple and oak clumps, and grassy openings. The north facing slopes are an almost unbroken canopy of old-growth fir, cedar, and hemlock. The river, highway, and powerlines share the narrow canyon floor, and are in almost constant visual contact. Long segments of the fill slope of the highway are unvegetated riprap. The road shoulder is either barren or weedy appearing. Galvanized steel guardrails define the grade break between the road and the river. Many areas adjacent to the highway appear disturbed due to their use as parking areas by recreationists. Many campgrounds occur in this section. Other areas, including one at Memaloose, are unnatural in appearance, because of their use as soil disposal sites by Oregon Department of Transportation. Views to the east include Fish Creek Divide, which has been heavily modified by timber harvest. The steel truss bridges (Memaloose, Carter, Armstrong, Fish Creek, Whitewater and Cripplecreek/Sandstone) are attractive architecturally, but the light green color does not blend well with the natural dark greens, browns, and warm grays of the landscape. From the Clackamas River Trail from Fish Creek to Indian Henry, views of the highway fill slopes, guardrails, and other features are common. "The Narrows" is perhaps the most dramatic place in the landscape, whether viewing it from the highway, the trail, or floating through it on a kayak or raft. Here the river funnels through vertical basalt columns rounded by the erosive force of the Clackamas. Overall, the landscape of this entire section is natural appearing, but with obvious human impacts, the most obvious of these being the highway.

Powerlines and Dispersed Camping



Indian Henry to Collawash

In this section, the highway has a less developed character, with a narrower cross section, sharper curves, and less guardrail. The road is farther away from the river; the view from the river is entirely natural, while the view from the road is less dramatic due to the absence of the river. Campgrounds are mostly small and unobtrusive, including Alder Flat, Rainbow, Ripplebrook, Riverside and Riverford. The four-mile Riverside Trail and Road 46 come into visual contact near Riverside Campground. Timber cutting is apparent on some ridges outside of the immediate corridor. On the whole, the landscape is natural appearing with only a few interruptions.

Collawash to Big Bottom

The river and highway are close due to the very narrow canyon. Much of the highway fill slope, which comes right down to the river's edge, is poorly vegetated. The road is narrow, and there are few safe places to pull over. Several dispersed recreation sites are in poor condition and detract somewhat from the overall scene. At Austin Hot Springs, the only private parcel within the river corridor, timber cutting and the presence of many concrete culverts are a sharp contrast. Further downstream, the forest is mostly natural appearing, except for some timber harvest along the south facing slope and to the west.

Big Bottom to Forest Road 4690

The valley flattens out enough to allow the road and the river to diverge somewhat so that they are not generally in visual contact. Old-growth Douglas-fir and western redcedar are abundant. Few visual intrusions occur, except for some partial views of timber cutting on Rhododendron Ridge to the west. The view from the river is quite natural. Several dispersed recreation sites near the 4670 road detract somewhat from the overall scene.

Forest Road 4690 to Big Spring

The road here is high above the river as it climbs out of its valley. The forest is dominated by mature cedar and fir, but just outside of the immediate corridor much of the forest has been logged, including some areas between the road and river. Views to nearby ridges also reveal a heavily harvested landscape in geometric patterns. Scenic quality is generally compromised.

Much of the following information comes from "Preliminary Geologic Map and Cross Sections of the Upper Clackamas and North Santiam Rivers Area, Northern Oregon Cascade Range" (Hammond, Geyer, and Anderson, 1982), and the Mt. Hood National Forest Soil Resource Inventory (Howes, 1979).

The character of the Clackamas River corridor is strongly influenced by the geology. The Clackamas River flows through parts of the two major rock units in the Oregon Cascades - the older Western Cascade Province and the younger High Cascade Province. The Western Cascade Province consists chiefly of dark colored lava flows, light colored pyroclastic flows, and related deposits. These rocks have undergone widespread low-grade metamorphism and local hydrothermal alteration. They have been deeply dissected by stream and glacial erosion. As indicated by the name, these rocks are exposed west of the Cascade crest. The rocks of the High Cascade Province form a plateau capping the Cascade Range. Included are the prominent Cascade volcanoes, such as Mt. Hood and Mt. Jefferson, but also many smaller and lesser known volcanoes, such as Olallie Butte and Sisi Butte. The rocks of the High Cascade Province are only slightly altered, dark-colored lava flows. The high plateau has been only slightly dissected by stream and glacial erosion.

Geology

The Clackamas River begins on the slopes of one of the High Cascade volcanoes, Olallie Butte. The Olallie Lakes area at the base of the volcano has been mantled with glacial deposits and the drainage system is poorly developed. It isn't until the Clackamas River cuts to the west around Sisi Butte that the first bedrock is visible. This rock is part of the High Cascade Province. Throughout the first river segment and half of the second river segment the corridor is dominated by glacial till and outwash deposits. The shallow soils that have developed on this material are yellowish brown, gravelly sandy loams.

About four miles upriver from Big Bottom the bedrock changes to the Western Cascade Province rocks. At this point the Clackamas River has cut down through the younger High Cascade rocks. Glacial deposits still cover most of the valley bottom and lower valley sideslopes, including the Big Bottom area.

An area of rock that has undergone intense alteration occurs just downstream from Big Bottom, on the north side of the river. This alteration is probably related to the nearby Austin Hot Springs. Hot springs are created when groundwater comes into contact with heated rock far below the earth's surface. In the Cascade Range most of the hot springs occur near the contact of the Western Cascade Province with the High Cascade Province. The more recent High Cascade rocks provide the heat and the altered and fractured Western Cascade rocks provide the openings to the surface. At Austin Hot Springs about 250 gallons per minute of 190 degree F water issue from several openings along a 300 foot stretch of the river.

About two miles downstream from Austin Hot Springs is the first of many large landslides and earthflows that determine the character of the river corridor from here to the end of river segment five at Indian Henry Campground. These large landslides and earthflows are up to seven square miles in size. The large mass movements are a result of the high degree of alteration and weakening of the Western Cascade rocks and the past actions of the Clackamas River Valley glacier, which eroded away the lower valley slopes and then melted away, thereby removing lateral support from the oversteepened slopes. From Riverside Campground to Indian Henry Campground there are huge earthflows on both sides of the river. Earthflows are slow moving landslides of soil and weathered rock occurring on gentle to moderate slopes. Small portions of these earthflows are still moving downslope, aided by the erosive action of the river along their toes. Soils on the earthflows are dark yellowish brown to grayish brown, silty clay loam. Soil slopes in this area are plagued by stability problems.

The valley glacier extended as far down drainage as Indian Henry Campground, near the beginning of river segment six. Below this point the river corridor changes dramatically in appearance. Without the erosive power of the glacier, the valley becomes narrow and steep sided. The bedrock also changes here. From Indian Henry Campground to Big Cliff nearly all the visible outcrops belong to the Columbia River Basalt Formation. The Clackamas River has incised deeply into this formation. In some areas small landslides and talus slopes cover the cliffs, but there are many excellent exposures of the sequence of up to 19 basalt flows and five major interbeds that make up the Columbia River Basalts in this drainage. In the cliffs above Bob's Hole, 16 separate flows and five well developed interbeds are exposed. The Narrows and the 600 foot high Big Cliffs are some of the landmarks along the river which were created by the basalt flows. The resistant rock of the basalt flows stand nearly vertical. The less resistant interbeds form benches.

The basalt flows that entered this area covered a fairly flat surface. Mudstones and siltstones containing leaf fossils and wood fragments are visible near road level at the base of the sequence of flows. Many of the interbeds contain wood fragments and leaves, indicating that forest vegetation was well established between flows. The nearly horizontal flows are offset by many small faults. Soils in river segment six are very shallow and have a high erosion hazard and failure potential.

Access and Travel Management

The Clackamas River has taken advantage of a series of northwest and north trending faults to develop its drainage. Very little mineralization has taken place along these fault systems. As a result the lands within the corridor have low mineral potential. There are no known mining claims within the corridor. No interest has been expressed in locatable mineral exploration or development. There are geothermal leases that cover most of the corridor from the headwaters to the Three Lynx area. The area around Austin Hot Springs is a Known Geothermal Resource Area (KGRA) which suggests high geothermal potential on the periphery. There is one oil and gas lease within the corridor; however the potential for exploration and development is low. There are two current Forest Service rock quarries which are in or near the river corridor boundaries. Both are in river segment three and are not visible from the river or Forest Service Road 46.

Easy access to the river via paved roads and maintained trails suggests many opportunities for interpretation of the varied geologic features and processes.

The designated river corridor is served by Oregon State Highway 224 and Forest Service Road 46 and 4690, with numerous feeder roads. State Highway 224 is a State District Highway, the state's least developed designated level. It provides the primary means of access within the Clackamas River corridor to Ripplebrook Bridge, where the roadway becomes Forest Service Road 46. Forest Road 46 is a Forest Service arterial with the Mt. Hood's highest level of maintenance.

Forest Road 4690 is a collector road, a lower classification than an arterial and is maintained for passenger type vehicles at a lower level than Road 46.

Existing Uses

Highway 224 is used as the primary access from Estacada to upriver recreation and administrative sites, and a primary timber haul route. It connects with Forest Road 46, which also provides access to Bagby Hot Springs, a popular recreation destination to the southwest, and Timothy Lake and Highway 26 corridor to the southeast. Traffic counts in 1991 indicate that forest land and river recreation users make up the majority of non-commercial traffic on Highway 224 and Road 46.

Highway 224 is a two-lane district highway, with travel lanes varying in width from 10 to 12 feet and a design speed of 35 mph. Roadway shoulders vary from one to four feet, and have an asphalt surface.

The portion of Highway 224 from Big Cliff to Indian Henry campground has been designed to accommodate bicycle use as well as oversized vehicle use. From Indian Henry upstream to Ripplebrook Bridge, the road is designed for standard-sized commercial vehicles and passenger vehicles. Shoulder widths often do not meet minimum bike route standards.

Although shoulder widths often do not meet minimum bike route standards, Highway 224 is also a dedicated State Bike Route. State Bike Routes set minimum standards of a 4-foot shoulder as being adequate to accommodate bicycle traffic along a highway not passing through an urban area. The Bike Route is not posted.

Although traffic data are variable at specific locations and between specific years since 1975, it is estimated that 95 percent of the total traffic on the route is from local commercial, recreational, and administrative access to Federal lands. Based on historical traffic volumes on Highway 224 from 1982 to 1990 (in coordination with ODOT traffic officials), it is estimated that given the normal State design criteria for growth of 2 percent, sections of Highway 224 which currently have a design template of 12-foot lanes and 4-foot shoulders will be adequate for projected traffic growth for the next 10 years.

Highway 224 encounters a major landslide at Foreman Hill, just below Timber Lake. In addition, other areas along Highway 224 have been closed due to rock and mudslides in the past. Roadway relocation is under consideration for the area from Foreman Hill to Ripplebrook Bridge. A rockfall mitigation project also is proposed for points along a 1.3 mile stretch of highway from Mile Post 43.2 to 44.5. The project begins approximately 1 mile west of Dinner Creek and ends just past Deer Creek.

Road 46 is a two-lane, asphalt surfaced major arterial, with travel lanes of 10 feet in width, and a design speed of 25 mph. Shoulders vary from zero to one foot.

Currently narrower sections do not meet minimum design standards for existing traffic volumes and the mix of commercial and recreational traffic or bicycles. This has resulted in the planning for reconstruction of a 3.6 mile portion of Road 46 from Ripplebrook Bridge to the 63 junction to better accommodate all types of traffic.

Projects proposed in the Forest Plan include reconstruction of Road 46 at two locations: the first, Clackamas to Austin (from the junction of Road 63 to Austin Hot Springs) and the second, Clackamas to Carrigan (from Austin Hot Springs to Road 4660). These projects are scheduled for the latter part of the decade and have yet to be fully planned or designed.

As with Highway 224, traffic volume counts for Road 46 were variable from 1975 to 1990. During this 15-year period, the average daily traffic remained fairly constant to the Road 63 junction.

Current design standards for the level of traffic show that the minimum design standard according to Forest Service design criteria would be 11-foot lanes and 2-foot shoulders. This would meet current traffic volumes and mixes of traffic. Based on traffic growth history, this minimum would likely accommodate projected growth for the next 10 years.

Forest Road 4690 is also within the corridor. It is a single-lane paved road with turnouts. Lane width is 12 to 14 feet with a zero to one-foot shoulder. This roadway currently meets Forest Service Standards for its traffic volumes. It is not designed to accommodate bicycle traffic.

Highway 224 and Road 46 provide access to numerous other roads which, in turn, access private or BLM lands, as well as other Forest areas. Major Forest Roads accessed include Road 45 (Memaloose Road), Road 4620 (Sandstone), and Roads 4635, 57, and 63. Road 57 is being considered as a possible improved tie-through to Highway 26. Road 63 provides access to Bull of the Woods Wilderness, and Bagby Hot Springs.

Parking

There are no regulated (striped and marked) parking spaces on any of the roads. Some dispersed parking is accommodated at wide spots, at gravel and paved turnouts, and at developed campgrounds, trailheads, and boating put-in/take-out areas. During peak periods of use (summer holidays and white water events) highway parking along 224 is accommodated using shoulders and other unimproved areas.

The first four miles of Road 46 has few areas where the shoulder is wide enough to accommodate parking. Above that, parking opportunities in unimproved areas are available intermittently.

Road 4690 with its single-lane and minimal shoulders does not accommodate parking.

Maintenance and Stockpiles

Mass wasting of rock and soil along the roadway periodically fills the drainage ditches adjacent to the roadway. This is especially true for Highway 224 where there are steeper cliffs adjacent to the highway. This requires ODOT to continue with annual ditch maintenance and occasional cleaning and disposal of debris from large slides. The ditch maintenance frequently undercuts existing slopes, which aggravates instability and results in continued need for ditch maintenance.

Cleared material from Highway 224 is typically placed in an existing waste site along Highway 224 located at Mile Post 36 near Moore Creek. Material not disposed of at this site is often used to build and widen shoulders. Concerns have been raised that the use of this material for shoulder widening has resulted in materials entering the river.

Cleared materials from Road 46 and 4690 are typically hauled to a Forest Service disposal site, such as the Umpqua Pit near Road 63.

Current Forest Plan Direction

The Forest Service encourages coordination between agencies to assist in the development of road design standards and construction related practices. Standards and guidelines in the Forest Plan will guide development of reconstruction projects on all routes on Forest lands. Road Management Objectives will be determined in project planning, and decisions will be based on environmental, safety, traffic, use, and economic considerations. The road is not currently proposed as a Scenic Byway.

The Forest Plan limits open road densities. Some roads within the corridor are closed to motorized vehicles. District road closure plans are in place to achieve these objectives.

Past, Ongoing and Planned Timber Harvest

Timber harvest has occurred within and adjacent to the corridor over the last 70 years. In the earliest days, the majority of the timber harvested was done in conjunction with the construction of various transportation systems. Initially, some harvesting was done with a selection type silvicultural system which harvested only the largest and best trees.

Starting in the early 1920's, most of the timber harvesting activities used an even-aged silvicultural system. Clearcutting was the preferred method. It was successful in regenerating fast-growing plantations of Douglas-fir, especially at the lower elevations. When this method was used in the higher elevations and the more mixed conifer forest, the results were not as impressive, because of frost damage, vegetative competition and the planting of tree species not suited to environmental conditions.

Since the late 1960's and early 1970's, a mix of shelterwood and clearcut methods has been used. The shelterwood method has proven to be highly successful in the upper elevation, mixed conifer forest. To date, there are approximately 1,700 acres of managed plantations within the corridor or nine percent of the total corridor acreage. A large proportion of these stands have been precommercially thinned and fertilized to maintain forest health and to improve timber growth.

Most of the harvesting occurred within old-growth type forest and used the systems described above. Other harvesting has occurred but only in limited amounts. Salvage harvest of wind damaged and insect killed timber has occurred on a regular and extensive basis throughout the corridor. Some of the stands have also had diameter-limit harvesting in which the 12- to 16-inch trees were removed. In addition to this, some commercial thinning has taken place within the 50 to 120-year old stands.

Timber

In recent years there has been little or no timber harvest within the river corridor, with the exception of salvage of some wind-damaged stands. The planning of harvest opportunities has, for the most part, been deferred until the completion of this plan.

Forest Health

"Forest Health" has been defined by some as a condition in the forest in which the risk of present and future damage by natural and human caused stressors is minimized to meet site specific resource management objectives. A "healthy forest" is one that is resilient to changes and characterized by tree species and landscape diversity that provides a sustained habitat for fish, wildlife and humans.

The forests within and adjacent to the designated corridor have been and continue to be exposed to a broad range of stressors that affect their health. These include such agents and processes as fire, insects, diseases, wind, ice, snow, extreme temperature fluctuations, floods, precipitation, and management practices. Insects and diseases are most often symptoms of forest health problems. The majority of these forest health symptoms are most noticeable to the casual observer in the upper reaches, from Big Bottom to the Olallie Lake area. There is currently a major infestation of spruce budworm in this area. There are also scattered outbreaks of the Douglas-fir bark beetle within and adjacent to the entire corridor.

Past harvesting practices on some sites, and fire exclusion in general, have altered the tree species composition in some areas. Some parts of the forest are too dense, thereby reducing its vigor and making it more susceptible to insects and disease. Other areas have accumulations of blowdown trees which are breeding sources for bark beetles. Floods and changing drainage patterns can inundate root systems and cause tree mortality along river bottoms.

Socioeconomics

In general, the socio-economic environment is considered to be the residents and businesses in close proximity to the Clackamas River. Although no specific data exist for this area, data on Clackamas County may give some indication of general trends for the region.

Data from the 1990 Census show a substantial population increase from 1980 in the area north and west of the Clackamas River. A high "quality of life", a temperate climate, and numerous job opportunities in the Portland Metropolitan area, led to this increase. Between 1970 and 1980 Clackamas County grew by 45.7 percent (Oregon Employment Division, 1992). During this period, Multnomah County grew by 1.4 percent, while the city of Portland decreased in population by 3.1 percent. This indicates that the population growth during this period was concentrated in the "bedroom communities" and unincorporated areas that surround the city of Portland.

A severe recession in 1981-1982 brought about a decline in the annual rate of population growth as compared to the 1970's. This recession was cyclical in nature, the result of a business downturn which left an inadequate demand for workers in the economy. Between 1980 and 1990, Clackamas County population expanded by 15.3 percent. Population trends returned to pre-recession patterns in the late 1980's as a result of Portland's strong economy in 1988-1990 (Oregon Employment Division, 1990). 1990 figures for Clackamas County show a population of 258,850 which is expected to increase dramatically over the next decade. Some of this new growth would occur in semi-rural areas in the vicinity of the lower river.

Economic Environment

Services, the top earning industry for Clackamas County, accounted for 23.0 percent of earnings. Manufacturing accounted for 14.8 percent, and retail trade 14.1 percent (Oregon Employment Division, 1992). The fastest growing industry in Clackamas was wholesale trade, which increased by 19.6 percent from 1988 to 1989.

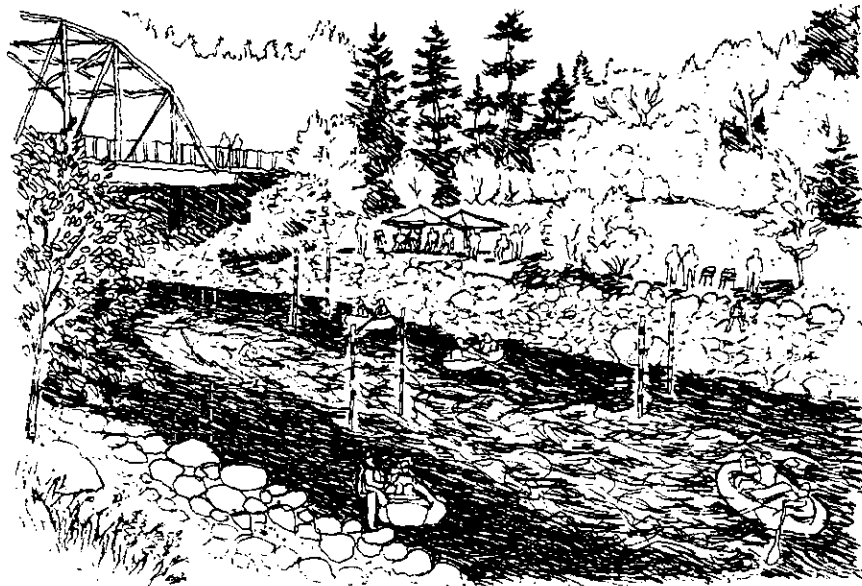
The economies of nearby communities are built predominantly on a mixture of service, timber industry, light manufacturing, utility (PGE) and Forest Service jobs. Overall, Clackamas County has a strong and diversified economy, especially in the urbanized northwest part of the county. Smaller communities in the southern and eastern parts of the county are still tied to resource-based employment and are in some ways atypical of the rest of the county. Roughly half of the county's labor force commutes to work in Portland. As economic growth moves eastward, the economies of river communities may diversify. Some people will continue fishing, hunting and woodcutting on the Forest to supplement household incomes.

In the Clackamas River corridor, there are several lumber mills all located outside the federally designated portion. These include mills in Estacada, the Barton-Carver area, Oregon City, Molalla, and Detroit. A secondary wood products industry is also increasing. Tourism-related jobs in Estacada and Detroit are limited but increasing, with many more motels and recreation services available in Detroit. A few outfitter guides provide fishing, rafting and guiding services in the river corridor and adjacent areas.

The main tourist attraction in the corridor is the river itself with its associated fishing, white-water boating, and camping opportunities. The Clackamas River trail, several campgrounds and the outstanding boating and fishing draw thousands of recreationists a year. Annual events include Bob's Hole Whitewater Rodeo and the Whitewater Festival, which draw participants from several western states.

Resources, services, and facilities on national forest lands are important for generating revenue in the tourism and timber industry sectors. Non-commodity values in the Clackamas River corridor contribute to the high quality environment enjoyed by both nearby residents and by visitors.

Annual White Water Festival



Air Quality

Air quality in the Clackamas River drainage is for the most part excellent. Major weather systems from the west, local wind flows, and daily mixing of air masses keeps the river corridor air fresh and clear most of the time. However, there are no air quality or visibility monitoring stations within the drainage, making quantitative characterizations of local air quality impossible.

Air quality and visibility in the Clackamas River Area is impaired at times from a variety of sources. Local meteorologic patterns which could influence overall air quality include inversions which can form over the drainage, trapping haze, smoke and other airborne pollution. These inversions are typically of short duration and are also generally limited to morning hours. Forest Service management activities have limited, localized impact on air quality and visibility. The main Forest Service activity that would affect air quality would be smoke from prescribed fires. This prescribed burning is strictly regulated through the State of Oregon Smoke Management Plan. Campfires and vehicle use inside the river drainage could also affect air quality and visibility. Such impacts would vary depending on the level of recreation activity and weather conditions. Clackamas River air quality is also affected by pollutants which come from outside the National Forest boundary. Prevailing winds from the west probably deliver pollutants from fieldburning, industrial operations, and automobile use.

Fire Management

The recent fire history within the drainage has been limited to small fires caused by lightning and human activity. High lightning strike areas exist over the southern half of the drainage and lightning tends to hit in this area before moving to the east. Most of these fires have been suppressed with relatively small acreages burnt. The drainage in normal years is relatively moist and is not conducive to fire spread. The potential exists for large fires when weather and fuels conditions are dry. Fires can also enter the drainage from outside the river corridor, but downhill spread would be dependent on fire behavior and weather conditions.

Due to recreation activities and vehicle use along the river, fire risk is quite high. This risk is somewhat lessened by road right-of-way clearing, campground maintenance, and other prevention activities, such as signing, patrols, public contacts and restrictions during abnormally dry periods.

Fire Protection

Wildland fire protection within the Clackamas River drainage is primarily shared by the Forest Service and the Oregon Department of Forestry. The Forest Service protects the majority of the drainage from the headwaters to an area just east of the North Fork Reservoir, and the remaining portion is protected by the Oregon Department of Forestry. The existing protection policy for the Forest Service is that all fires receive an appropriate suppression response based on the anticipated fire behavior. In the corridor, river-related resource values need to be protected and retardant drops should be directed to minimize entry of chemicals into the water. No prescribed natural fire policy exists for the river drainage and the use of prescribed fire is limited to treating areas for fuels reduction as a result of timber harvest.

Military Operations

A Military Flight Training Route (MTR) exists over a portion of the Clackamas River Drainage. The MTR crosses the river in the area of Pan Creek and encompasses an area of five miles on both sides of the centerline, roughly covering an area from Austin Hot Springs to Squirrel Quarry. The MTR is an Instrument Flight Regulation (IFR) Training Route with continuous hours of operations. The altitudes involved in the training route are from 500 feet Above Ground Level (AGL) or below, with a ceiling of 7,000 feet Mean Sea Level (MSL). The width and the altitudes involved in the MTR serve as an alert to other airspace users as to the range they may expect to encounter military air traffic. The type of military aircraft using the MTR varies, but generally helicopters and jet aircraft have used the route. The military overflights are normally of short duration but could create some minor noise pollution.

Chapter 3

Alternatives

Summary of Alternatives and Desired Future Condition

The following describes a selection of management options for the river corridor. Alternative A represents continuation of current management. Alternatives B - E are packages of proposed refinements or changes to current management, each packaged according to a somewhat different long-term vision for the corridor. Alternative B envisions a corridor that could be described as more "wild" and less developed than it is now. The future described in Alternative C forms the other end of the spectrum -- a corridor emphasizing visitor use and convenience. Alternatives D and E are mid-range proposals, one with a slightly higher emphasis on accommodating recreation demand, the other sacrificing some recreation opportunities to further enhance the fishery resource. The Alternative which is finally selected (occurs on publication of the Decision Notice) would be the 10-year management program applied to the river corridor.

The following text summarizes each alternative management strategy. The Alternate Management Strategies Comparison Matrix (Table 3.1) lists proposed management actions for each alternative.

Alternative A

This alternative focuses on furthering the intent of, and implementing projects proposed under, the Forest Plan. The intent of the plan is to provide for a wide variety of activities while protecting and/or enhancing the outstandingly remarkable values, protecting the river's free-flowing characteristics, maintaining the classifications of Scenic and Recreational, and maintaining the prescribed Recreation Opportunity Spectrum (ROS) Class. This alternative is the "No-Action" Alternative, since the Forest Plan direction is the current applicable land management direction for this area.

Management actions proposed in subsequent Alternatives (B - E) are consistent with the Forest Plan, unless otherwise noted.

Alternative B

This alternative focuses on enhancing the ecological and cultural resource values of the corridor. It allows recreation activities where they do not conflict with ecological and cultural resource values. The influence of the highway would be minimized, and denuded or trampled areas would be restored. Existing old-growth stands within the area seen from the river or the highway would not be further fragmented by management activities. Stands of younger trees that are beginning to have characteristics of mature/old-growth forests would be identified for retention, in order to re-establish contiguous old-growth habitat. Wildlife travel routes would be protected and native fish stocks enhanced. Populations of sensitive/rare plants would be identified and habitat would be protected and restored where necessary. Recreation use would be concentrated in fewer areas along the river, with facilities and activities evaluated for consistency with goals to protect and enhance ecological and cultural resource values. Designation of State Highway 224/Forest Road 46 as a National Scenic Byway would not be pursued.

Alternative C

This alternative emphasizes meeting regional recreational demands and managing use of the corridor and highway to encourage tourism-related economic development in nearby communities. This alternative most closely matches strategies being developed for economic development in Estacada. Proposals include seeking National Scenic Byway status for State Highway 224/Forest Road 46, and a complementary capital improvement program to upgrade the highway, construct recreation and interpretive facilities, provide more visitor conveniences, and improve access and capacity for a variety of recreationists. Recreation/tourism-related development would emphasize easy access and user convenience. Higher levels of whitewater use would be allowed unless ORVs were adversely affected.

Partnerships would be encouraged to handle maintenance of recreation facilities and law enforcement in the corridor. Put-and-take fishing would be emphasized. Only the most important natural resource areas (i.e., Big Bottom) would be protected from potential recreation development.

Alternative D

This alternative focuses on enhancing the ecological and cultural resource values while accommodating certain recreational uses. It combines parts of alternatives B and C, focusing most of the recreational emphasis in the section downstream of the Collawash, and focusing most of the environmental enhancement in the upstream section. Existing old growth stands within the corridor would not be further fragmented by management activities. Stands of younger trees would be allowed to mature and blend with existing old growth. Wildlife travel routes would be protected and native fish stocks enhanced. Populations of sensitive/rare plants would be identified and habitats would be protected and restored where necessary.

This alternative would only accommodate that portion of existing and projected recreation demand that is dependent upon a natural forest and/or river settings. Highly developed recreation facilities would be limited and concentrated in areas such as Estacada/Promontory Park and the Ripplebrook/Timber Lake/Three Lynx area. Some campgrounds would be upgraded and day use would be enhanced. Some facilities would be expanded, and others developed, but only after close consideration of feasibility and resource values. The trail system would be expanded. Scenic Byway designation would occur, but would not be accompanied by active promotion, or by substantial roadway expansion or roadside development. Instream structures to improve fish habitat would be designed to respond to the interests of kayakers.

Alternative E

This alternative is similar to Alternative D; also dividing the river into two sections at the confluence with the Collawash River. Recreation development would be greatly enhanced within the downstream segment, and maintenance and restoration of natural systems would be the primary emphasis upstream. New campgrounds or campsites would be located away from riparian areas. Camping areas outside of designated campgrounds (upstream of Ripplebrook) may be closed to protect riparian areas. Summer steelhead fishing would be emphasized below Ripplebrook, with restoration of native stocks and riparian habitat emphasized in upstream reaches of the river.

Anemone deltoidea along
the Clackamas River Trail

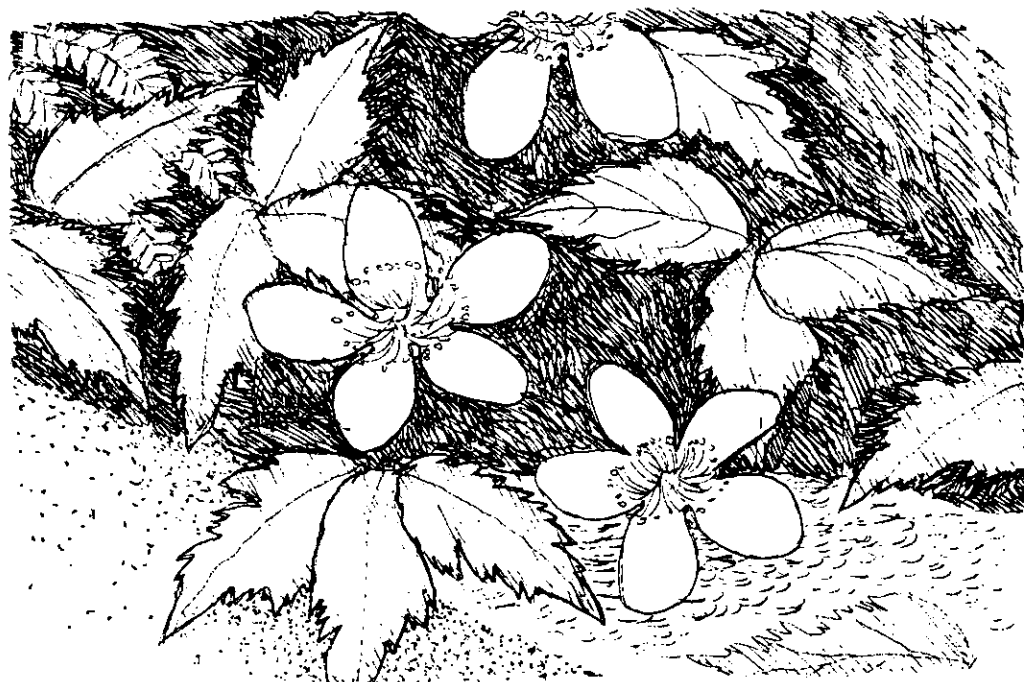


Table 3.1 Clackamas National Wild and Scenic River and State Scenic Waterway Alternate Management Strategies Comparison Matrix

Topic	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
State Scenic Waterway Classification and Implementation					
	"Recreational River Area" total length.	Match Federal. Same classification, same segments	Same as B.	Same as B.	Same as B.
Corridor Boundary					
	Federal/State: interim boundary 1/4 mile each side of river. Total acres: 15,200	Amend Forest Plan to adopt new Federal Wild and Scenic River boundary. See Map 3.1. Total acres: 15,600 State scenic waterway boundary is same as A for all alternatives.	Same as B.	Same as B.	Same as B.
Hydrology					
Water-Related Projects					
• Actions common to all alternatives.	Operation of existing water-related (e.g., hydroelectric, municipal, water supply, etc.) projects is accepted/allowed under terms of current license or permit. All water-related project proposals would be subject to a project-specific analysis of potential effects on river values. The project proponent would be responsible for conducting studies/analyses acceptable to Forest Service and other agencies, Forest Service to communicate concerns, requirements, prohibitions, etc. to other licensing or permitting agencies (FERC, Oregon Water Resources Department, DSL, etc.). Opportunities to improve flow conditions and operating conditions of the existing hydroelectric projects would be explored during relicensing.				
• Expansion / Modification of Existing Water-Related Projects	Allowed if no substantial adverse effect to river values.	Allowed if values maintained or enhanced.	Same as A.	Same as B.	Same as B.
• Construction/ Operation of New Water-Related Projects	Allowed if no substantial adverse effect to river values.	Prohibited in corridor. Discouraged in tributaries. May be allowed if determined river values remain in optimal condition.	Same as A.	Same as B.	Same as B.
Water Quantity	Recommend continued USGS and PGE flow monitoring at existing gauging stations on mainstem and tributary streams. Recommend State of Oregon to establish minimum instream water rights for recreational value through state (WRD) process. Recommend ODFW to apply for additional instream water rights for fish. Forest Service would quantify instream flow needs to protect flow dependent resources.				

Topic	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Water Quality	Continue random short-term monitoring, associated with specific projects having potential to impact water quality; emphasis on temperature and turbidity parameters.	Develop a cooperative (EPA, USFS, USGS, DEQ, local communities, friends groups) monitoring program for water quality. Program will include water quality parameters and thresholds reflecting potentially affected beneficial uses (fish, recreation, etc.), and an action plan outlining notification procedures and mitigation measures if water quality standards are not met. Forest Service will develop instream flow needs pursuant to February 12, 1992 Region 6 Water Quantity/Quality Process Paper.			
Fisheries					
Actions Common to All Alternatives	Continue inventories and surveys of fish and aquatic organisms on an as-needed basis. Correct fish passage problems at culverts on Fawn, Lowe, Mag, Rhododendron, Ruby, Tag, Tar, and Wolf Creeks. Naturally occurring debris would not be removed from river unless hazardous to public. Develop cooperative agreement with ODFW to complement subbasin plan. Coordination with entities interested in restoring runs of native fish stocks such as the National Marine Fisheries Service, U.S. Fish and Wildlife Service, Portland General Electric and Oregon Trout and develop cooperative working agreements and MOU's to implement items to restore native fish stocks.				
Fish Habitat Structures					
• Anadromous Fish Miles Treated	Determined on project basis. No site specific strategy was included in Forest Plan.	10 mi. total RM 57-65 RM 72.8-74.8.	None	11 mi. total RM 56-65, RM 72.8-74.8; create "holding" areas near campgrounds.	12 mi. total RM 55-65; RM 72.8-74.8
• Structure Types	Determined on project basis.	Boulder-log complexes.	None	Boulder-log complexes.	Boulder-log complexes.
• Density (no. per 1,000 feet of river)	Determined on project basis.	Greater than 15	No structure	10-15	Greater than 15
• Maximum allowable span across channel	Determined on project basis.	100 percent	0 percent	50 percent	75 percent
• Side Channels Created	Yes	Yes	No	Yes	Yes
Fish stocking practices consistent with plan goals	Continue current levels and locations of stocking of rainbow trout and summer steelhead.	Reduced locations and numbers.	Increase locations and numbers, if no detriment to wild stocks. Stocking inconsistent w/plan above Collawash.	Same as A.	Same as A, below Collawash. Stocking inconsistent w/plan above Collawash.

Topic	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Watchable Wildlife Opportunities					
• Implement bird-banding and monitoring station.	No	Yes	Yes	Yes	Yes
• Develop watchable wildlife sites.	No	Yes	Yes	Yes	Yes
Botany and Ecology					
Actions Common to All Alternatives	Maintain and enhance known populations of sensitive, threatened, and endangered plants and their associated habitats. Develop interpretive natural history program to include access and other information on unique plant communities along the Clackamas River. Restore native vegetation along roadsides, in riprap, and in riparian areas, where feasible.				
Rehabilitation of user-impacted riparian zones.	Within 100' of river, modify, rehab, or remove informal recreation use areas not consistent with riparian values.	Same as A, but close 75% of remaining capacity between river and road, between Collawash and road 4690. Criteria for closure includes: potential for side channel construction, extent of resource impact, and potential impacts to users.	Same as A; otherwise, maintain existing capacity or convert to day use.	Same as A, plus closures to achieve desired ROS class, and other plan objectives (see also Recreation and Public Use, Informal Use Areas, p. 54).	Same as B, but close 50% of remaining capacity.
Cultural Resources					
Actions common to all alternatives	Cultural resources will be protected.				
Encourage nomination of cultural resources to the National Register, including Three Lynx townsite (as Historic District.)	Yes	No	Yes	Yes	Yes
Same as A, plus note use of "Passports in Time" (national program involving volunteer help for cultural resource projects) for archaeological excavations. Incorporate Clackamas corridor cultural resource information into regional publications. Consistent with ROS classes. Enhance access and interpretation of cultural resource sites, where such sites can be adequately protected. Stabilize and rehabilitate sites currently being degraded.					

Topic	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Recreation and Public Use					
Recreation Opportunity Spectrum (ROS) Classification					
• Classification used	Generic ROS classification (see ROS Primer)	Amend Forest Plan to incorporate a revised ROS classification, tailored to the Clackamas Wild and Scenic River (see Appendix E). Motorized boats are not permitted in any of the designated river segments.			
• Big Cliff to Whale Creek	Roaded Natural (RN)	Roaded Natural (RN)	Rural	Roaded Natural (RN)	Rural
• Whale Creek to Tar Creek	Semi-Primitive Non-Motorized (SPNM) or Semi-Primitive Motorized (SPM) would meet intent of Forest Plan.	SPNM beyond +/- 300 ft. SPM from Hwy 224/46; otherwise SPM.	SPM	SPM; RN beyond 1/4 mile from river.	SPM
• Tar Creek to 4650 Bridge (June Cr.)	RN	RN	RN	RN	RN
• 4650 Bridge to 4690 Jct.	SPNM or SPM would meet intent of Forest Plan.	SPNM	SPM	SPNM beyond +/- 300 ft. from Forest roads, SPM within +/- 300 ft.	Same as B.
• 4690 Jct. to 4690 Bridge	RN	SPM			
• 4690 Bridge to Big Spring	SPNM or SPM would meet intent of Forest Plan.	SPM			
Recreation Facilities (Existing)	All sites not currently at standard Forest Service maintenance levels would be rehabilitated to that standard by the year 2000. Rehabilitate to achieve design capacity, and to meet revised ROS class and other area objectives.				
• Percent overnight units eliminated or converted to day use.	5% converted to day use.	50% closed; not relocated. Reservation system and concession operation implemented for all remaining units.	30% converted to day use; capacity replaced in one to two large campgrounds outside riparian zone. Operated by concessionaire.	10% converted to day use; capacity replaced in new upriver campground. (Cub Creek)	10% converted to day use.
Recreation Facilities (New)	Facility development in the corridor would be planned to be consistent with the revised ROS classification scheme. Common use and/or staging areas of trailheads and campgrounds may achieve the next lowest (less primitive) class. Currently disturbed/modified areas should be considered first for development. All developments should be located out of the riparian zone; trails excepted where riparian values can be adequately protected. Priorities for development and re-investment are based on node concept.				
• Trails	Construct/reconstruct trails to enhance trail "system", where consistent with plan objectives. All trails will be multi-user, where feasible, except for dedicated interpretive trails. All multi-user trails will have alternate routes identified in planning process, to be developed if future use levels or conflicts require separation. Incorporate overnight camping opportunities into urban link trail planning. Provide accessibility levels consistent with ROS Class Specifications, with effort to enhance access for short distances from trailheads and campgrounds.				

Topic	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Coordination with ODFW	Performed on an as-needed basis.	Develop a Memorandum of Understanding with ODFW to implement actions items insubbasin plan to restore native fish stocks. Specific action items determined on a case by case basis and based on analysis of problems affecting native fish stocks. Actions could include: -marking all hatchery released spring chinook salmon; -genetic studies to determine if two stocks of coho salmon exist in the Clackamas River; -studies to determine if competition between the early and late-run coho stocks and between summer and winter steelhead juveniles is inhibiting restoration of native stocks; -studies to determine factors limiting production of anadromous fish; -studies to determine if hatchery origin winter steelhead are interbreeding with native winter steelhead; -studies to refine existing and future habitat capability and biological production potential for native fish stocks in the Clackamas basin; and	Same as A.	Same as B.	Same as B.

Topic	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Wildlife		-other action items outlined in subbasin plan or determined necessary through coordination and additional information.			
Actions Common to All Alternatives	Survey for bald eagle habitat occupancy. Review suitable habitat for potential peregrine falcon nesting sites. Complete 10-year elk transplant program. Meet Regional direction for spotted owl management. Protect all known osprey nest sites. Complete all habitat and species inventories required by Forest Plan. A biological evaluation for threatened or endangered species would be developed for each site specific project.				
Deer and Elk Habitat Management					
Forage Opportunities	Primarily provided through timber harvest and natural openings.	Maintain frost pockets and meadows as forage openings. Obliterate and seed/plant selected closed roads with forage plants.	Similar to B, and aggressively manage harvested areas to promote forage growth.		
Wildlife Habitat Protection					
• Protect beaver dams/dens.	Not addressed in Forest Plan.	Yes	Yes, where compatible with recreation use.		Yes
• Utilize beaver transplants to expand wetland habitat in selected sites.	No	No	Yes	Yes	Yes
• Except for road expansions, strongly discourage development, harvest, or ground disturbance in areas supporting breeding sensitive amphibian populations.	No	Yes	No	Yes	Yes
• In harvest areas, provide densities of snags and logs that approximate unharvested old-growth natural levels.	No	Yes	No	Yes	No

Topic	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<ul style="list-style-type: none"> Day Use Areas 	Not addressed.	Provide for multi-function day use areas wherever possible. Functions to be considered include: fishing access; picnicking; trailhead; orientation, viewing and interpretation. Provide only those combinations and scale of functions for which parking can be provided.	Provide for drive-through orientation, viewing and interpretation.	Same as B.	Same as B.
Incorporation of drive-through interpretive opportunities.	Not addressed.	Limited drive-through opportunities provided.	Increase capacity within and near corridor to match projected growth (see Table 2.3).	Increase capacity where necessary to accommodate projected growth for fresh-water bank fishing, non-motorized river boating, nature/wildlife observation, off-road bicycle riding, and hunting.	Same as B above.
Strategies for accommodating increased demand	Private operators to accommodate most. Otherwise, target projected high- and medium-growth activities.	Redirect as many users as possible to areas outside the river corridor. Focus upon low-impact day use in existing hardened areas.			
River Access (see also Access and Travel Management Section)					
<ul style="list-style-type: none"> Improvements 	Rehabilitate boat put-in and take-out.		Construct restrooms (or access to nearby facilities) and information/self-registration station, and stabilize banks at both put-in (Sandstone) and take-out (Mernaloose). Cooperate with BLM for all enhancements on BLM land (i.e., Mernaloose take-out ramp area).		
<ul style="list-style-type: none"> Access Points 		No new developed access points.	Develop drift boat access if demand is confirmed, and can minimize potential conflicts with other on-river uses.	No launch facilities for drift boats developed.	Same as C.
<ul style="list-style-type: none"> Bob's Hole 			Provide at-grade parking near Bob's Hole in a manner consistent with other plan objectives.		
Informal Use Areas	Develop site specific management prescriptions for "special uses."	Manage according to ROS class. Existing use areas classified under SPNM would be converted to walk-in sites, with parking in motorized zones. For all areas, maintain or reduce capacity.			
Information and Natural Resource Interpretation	Not specifically addressed in Forest Plan.	Cooperate with ODOT to develop a river corridor orientation station and photo point at the Highway 224 viewpoint above North Fork Reservoir. Develop quarterly visitor's guide, make available at Ranger Stations, local businesses and Olallie Guard Station. Develop a series of brochures that focus on a different resource / opportunity in the corridor. Incorporate interpretive improvements into all developed sites, as afforded by on-site opportunities, consistent with ROS guidance. Continue and expand provision of interpretive programs.			
Public Use Management and Law Enforcement					
<ul style="list-style-type: none"> Changes in use restrictions 	None	Implement closures necessary to achieve revised ROS class. Prohibit mountain bicycle use on Riverside National Recreation Trail.			

Topic	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<ul style="list-style-type: none"> • Law Enforcement • Whitewater use 	<p>No specific strategies presented to deal with increased demand.</p> <p>Not specifically addressed in Forest Plan.</p>	<p>Coordinate with Clackamas County to increase patrols in corridor. Provide Level II (basic) law enforcement training for all summer field personnel in frequent contact with visitors: emphasis to be on public information and education, and employee safety.</p> <p>Continue efforts to more accurately determine use levels, group size, and timing of use, as well as the social, physical, and environmental factors contributing to the whitewater boating opportunities. Outfitter/guide operating plans to include safety and ethics demonstrations for customers. Develop a USFS/BLM commercial permitting coordination agreement outlining authorities, administration, and fee collection associated with commercial recreation use on the Clackamas River.</p>			
Method to determine use and set use limits.	Forest Plan does not limit use, which is inconsistent with WSR Act.	Allowed use levels based upon average estimated annual use since designation. Commercial use prohibited.	Use levels determined by maximum that could be accommodated without impacts to river values.	Use levels determined through a two year monitoring period. Mandatory self-registration in long term. Provide social experiences based upon ROS classification for various river segments. Special events exempted unless safety hazard results.	
Administration	Not specifically addressed in Forest Plan.	Permit system instituted. Permits issued to individuals only, on a first-come first-served basis.	Allocation based upon max. commercial use up to 50%; 50% private use. Private: first come, first serve. Commercial: grandfather first, assign remaining allotment first come, first serve.	During study period, issue 3 commercial rafting permits to current permittees. Unregulated private use. Approximate commercial use not to exceed 20% of total estimated use levels since designation until validated through study. No additional permit system established unless other strategies to manage use fail. If permit system is invoked, efforts will be made to ensure fair and equitable access to both private and guided users.	
Management of Private Lands					
<ul style="list-style-type: none"> • Land Use Controls 	<p>As allowed under existing General Timber Zone; allows development to past levels (PGE ownership) but improvements would require conditional use permit, and be subject to State Scenic Waterway and DSL requirements (see Chapter 1). Waste removal and reforestation required.</p>	As allowed under County zoning revisions to conform to WSR and State Scenic Waterway management objectives.			
<ul style="list-style-type: none"> • Land uses consistent with river goals 	Not specifically addressed in Forest Plan.	Restoration to natural condition; discourage public use.	Overnight lodging facility; upscale, yet rustic. Maximum # of units = 15. May need zone change.	Remove waste and rehabilitate site. Development only to the level necessary for public safety and resource protection. Day use only. May require full-time on-site presence.	

Topic	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
<ul style="list-style-type: none"> Austin parcel identified for acquisition? 	No, priority 2	Yes	No	Yes	No
Scenic Resources					
Visual Quality Objectives					
<ul style="list-style-type: none"> Scenic segments, as viewed from river, roads, and trails. 					
Foreground	Retention	Same as A.	Same as A.	Same as A.	Same as A.
Viewshed (Middle and Background)	Partial Retention	Retention, would amend Forest Plan.	Same as A.	Same as A.	Same as A.
<ul style="list-style-type: none"> Recreational segments, as viewed from river and trails. 					
Foreground (The foreground viewed from roads 224 and 46 would be retention with all alternatives.)	Partial Retention	Retention, would amend Forest Plan.	Same as A.	Same as A.	Same as A.
Viewshed (Middle and Background)	Partial Retention	Retention, would amend Forest Plan.	Same as A.	Same as A.	Same as A.

Topic	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Access and Travel Management					
<ul style="list-style-type: none"> Planned Roadway Expansions 	<ul style="list-style-type: none"> "Clackamas River" (3.6 miles of reconstruction from Ripplebrook Bridge to 46/63 junction) "Clackamas-Austin" (5.0 miles of reconstruction from 46/63 junction, upstream. "Clackamas-Carrigan's Curve" (5.0 miles of reconstruction, extending upstream from the upstream terminus of the Clackamas-Austin project.) Roadway to be designed and constructed to minimize landform disturbance.	None.	Same as A, consistent with other Plan objectives. Minimize landform and resource disturbance.	Reconstruct to safely accommodate existing uses only to 63 Jct., consistent with other Plan objectives. Minimize landform and resource disturbance.	Same as D.
<ul style="list-style-type: none"> Target Uses 	Accepted	Discourage	Encourage	Accept	Encourage below 63 Jct; accommodated above.
<ul style="list-style-type: none"> Oversized Commercial Vehicles 	Accepted	Discourage	Encourage	Accept	Accept
<ul style="list-style-type: none"> Bicycles 	Accepted (state standards specify 6-foot bicycle lanes.)	Accept	Encourage (4-foot shoulder is adequate.)	Encourage up 46 Road to 63 Road (4-foot shoulder is adequate); accept above 63 Road.	Same as D.
<ul style="list-style-type: none"> Driving Experience 	Designed to drive as any other State highway. No special meandering trip considerations for the speed and WSR designation. Design speeds 45 mph (Hwy 224), 35 mph (Rd. 46).	Designed to drive at a slower more meandering trip. The speed and design accentuate driving through a natural setting. Design speed 35 between Three Lynx and Ripplebrook.	Designed to facilitate moving traffic from point to point; convenience emphasized, more places to stop and enjoy the river. Similar to A with emphasis on river activities and WSR issues. Recommended design speed same as A.	Same as B.	Below 63 Jct., same as C. Above 63 Jct., same as B. Recommended design speed 45 mph (224), 35 mph (46 above).

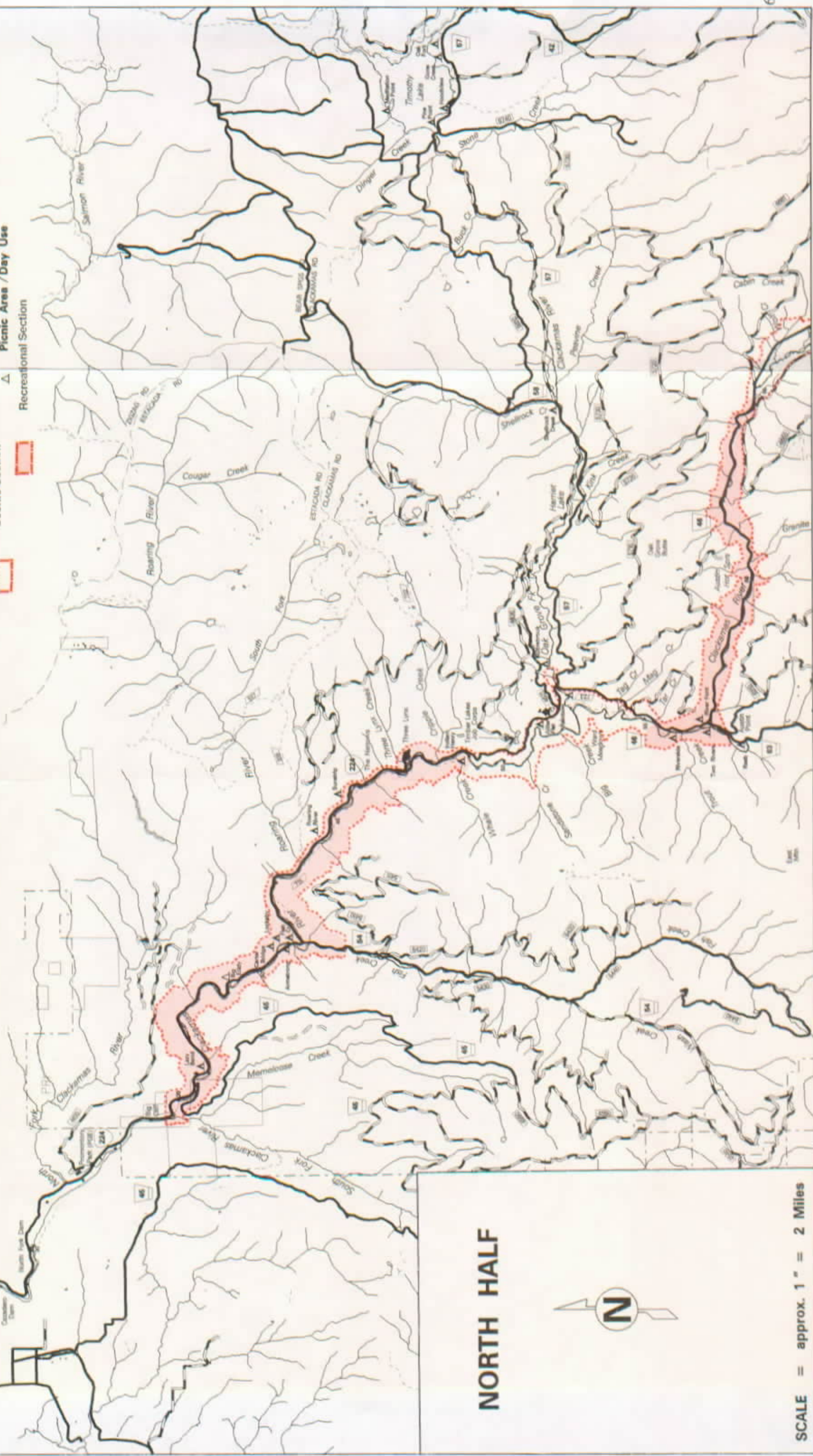
Topic	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
• Parking	Determined on project level	Minimal	Additional provided at attractions	Designed to accommodate site capacity	Below 63 Jct., same as C. Above 63 Jct., same as B.
• Motor vehicle access controls	Close roads where necessary to meet Forest Plan open road densities and ROS class.	Same as A, plus area closures likely in Big Bottom and Mag/Tag Creek areas.	Same as A.	Same as B.	Same as B.
• Maintenance	Coordinate with ODOT to minimize soil erosion and water quality degradation; no unpermitted depositing of materials ("sidecasting" onto banks and/or into river.)				
• Material Storage		Existing waste areas to be screened	to meet VQOs, or relocated if suitable sites available.		
	Not specifically addressed in Forest Plan.	No new waste areas.	New waste areas allowed if screened by vegetation or topography.	New waste areas in corridor allowed if they meet VQO requirements. Also consider incorporating waste material into potential recreation and highway construction/reconstruction projects.	Same as C below Road 63. Same as B above Road 63.
• Bank Stabilization	Treatments must be visually compatible with surrounding landscape; typically seeding, mulch/fertilizing.				
• Special Roadway Considerations	Develop a memorandum of understanding with ODOT, to specify standards and guidelines for maintenance activities in the river corridor.	None	Scenic Byway - high development emphasis.	Scenic Byway - low development emphasis.	Same as C, with low development emphasis.
Timber Management					
• Timber harvest in corridor					
• Forest Service administered lands.	"Regulated" timber harvest would occur in the corridor as a part of the Forest's Allowable Sale Quantity.	No "Regulated" harvest would occur; however, timber harvest may occur on an "Unregulated" basis if it is designed to protect or enhance river values and ensure visitor safety. This would amend the Forest Plan.			
• Bureau of Land Management administered lands (less than 200 acres, near Big Cliff.)	Approximately two-thirds of the BLM-administered lands would be managed primarily for the protection of soils and riparian values, with no planned timber harvest. The remainder would be available for forest management (150-year rotation), with emphasis on retention of scenic values.				

Topic	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Timber harvest outside of corridor on Forest Service administered lands.	Would not be affected.	Switch to retention in entrance viewshed would reduce harvest opportunities.	Same as A.	Same as A.	Same as A.
Harvest Methods	Uneven-aged management objectives could be met.	Uneven-aged management would be considered in highly visible portions. Even-aged management would be considered if visual quality			
Management for Old-Growth Characteristics	Not addressed	Silvicultural prescriptions would seek to maintain a continuous forest cover w/old-growth characteristics.	Same as A.	Same as B.	Same as B.
Hazard Trees	Not addressed	Standing trees determined to be a public hazard should be topped, rather than felled, unless safety objectives cannot be otherwise achieved.			

Map 3.1 Clackamas River Corridor - Proposed Wild and Scenic River Boundary, North Half

CLACKAMAS RIVER PROPOSED NATIONAL WILD AND SCENIC RIVER CORRIDOR

- LEGEND**
- Corridor Boundary
 - Paved Road
 - Gravel Road
 - Primitive Road
 - Trail
 - Forest Boundary
 - River Mileage
 - Scenic Section
 - Recreational Section
 - Oregon State Highway
 - National Forest Primary Route
 - Forest Route
 - Ranger Station
 - Campground
 - Picnic Area / Day Use



NORTH HALF



SCALE = approx. 1" = 2 Miles

Map 3.1 Clackamas River Corridor -
Proposed Wild and Scenic River Boundary
South Half





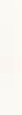



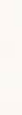









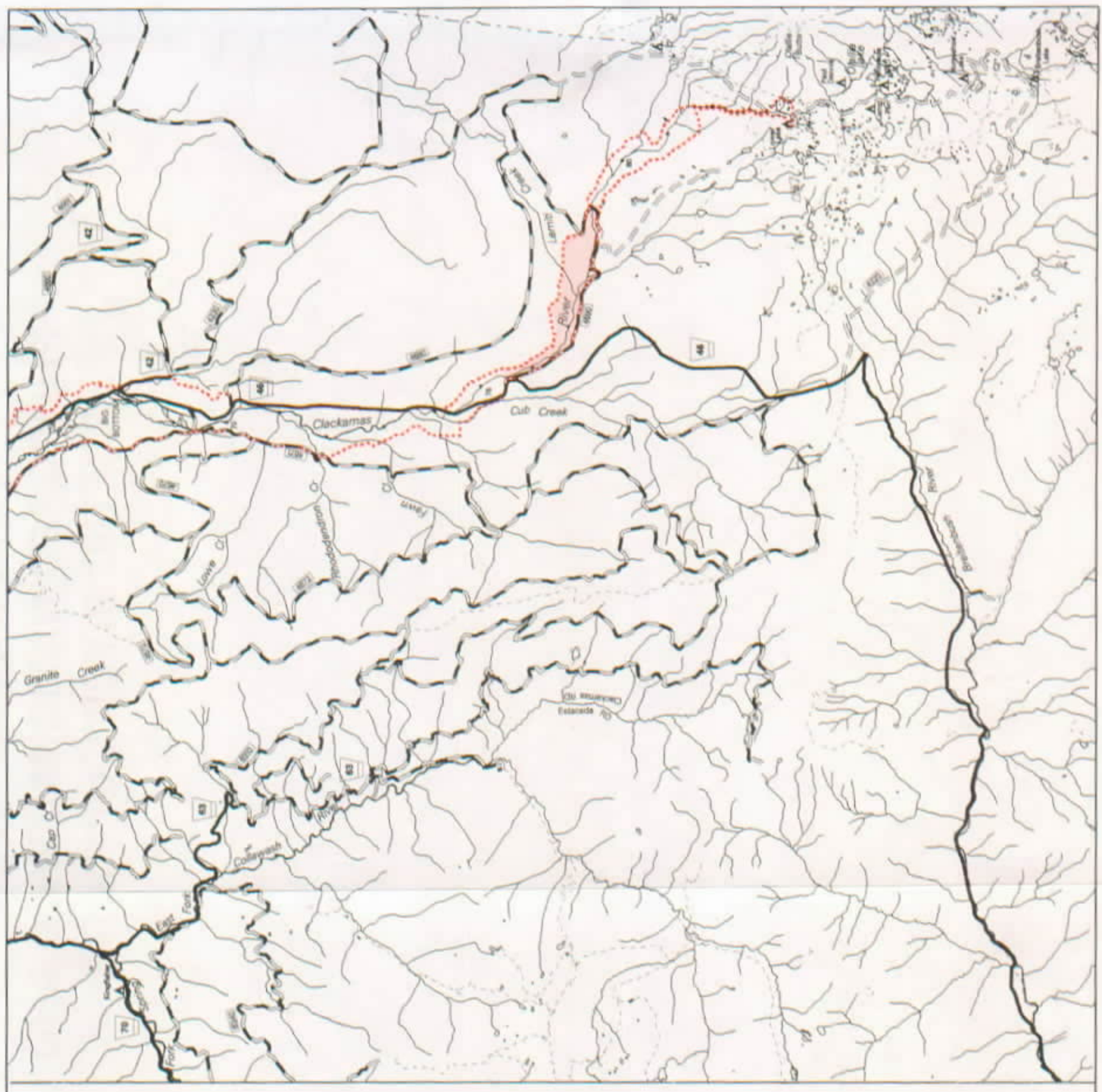
SOUTH HALF
CLACKAMAS RIVER
PROPOSED NATIONAL WILD AND
SCENIC RIVER CORRIDOR
MT. HOOD NATIONAL FOREST

1993

SCALE = approx. 1" = 2 MILES

LEGEND

-  Corridor Boundary
-  Paved Road
-  Gravel Road
-  Primitive Road
-  Trail
-  Forest Bdy
-  River Mileage
-  Scenic Section
-  Recreation Section
-  Oregon State Highway
-  National Forest Primary Route
-  Forest Route
-  Ranger Station
-  Campground
-  Picnic Area / Day Use
-  Recreation Section



Chapter 4

Environmental Consequences/Effects of Implementation

Introduction

This chapter forms the scientific and analytic basis for comparing alternatives. The effects that each alternative would have, if implemented, are analyzed and displayed. Short-term, long-term, direct, indirect and cumulative effects are considered. Table 4.1 summarizes effects in matrix form.

Hydrology and Water Quality

The magnitude, duration, frequency, and timing of streamflows, as described in Chapter 2, are anticipated to remain nearly the same for all alternatives.

Population growth within and adjacent to the Portland metropolitan area and increased recreational demand within the vicinity of the Mt. Hood National Forest will have an impact on the water quality of the Clackamas River. The demand for water within the watershed is still expected to increase, at least slightly, for all alternatives. Recent rules adopted by the Oregon Water Resources Commission governing the issuance of new water rights, limit the purposes to domestic, minor commercial domestic, livestock, and public instream uses. While the increased consumptive water use would vary by alternative, the increase is expected to be nominal in all cases.

Non-consumptive water diversions associated with proposed modifications and additions to facilities of the Oak Grove Hydroelectric project would have little effect on mainstem flows, but may substantially affect several small tributary streams.

Forestry practices, minor residential and commercial expansion, increasing demands for water withdrawal, and increased recreational use and development within the watershed could affect future water quality. Areas of concern include potential increases in sediment, runoff, chemicals, and bacteria. While best management practices for the protection of water quality would be prescribed and implemented for projects and activities under all alternatives, the risk of water quality problems would be expected to increase commensurate with increased development. Water quality effects described for each alternative should be interpreted in terms of risk of water quality degradation or potential for water quality improvement.

The interactions of management activities on groundwater recharge and the functioning of aquifers are similar to the interactions described for streamflow in earlier sections, except for timing differences. Aquifer responses to activities are typically slower and fluctuate less than surface streamflow. It is impossible to predict with any degree of certainty what effect management activities within the watershed would have on regional or downstream aquifers. However, it is unlikely that any adverse effects would occur provided that activities are conducted in a manner which reasonably maintains water infiltration characteristics. In particular, meeting current Forest Plan standards related to water and riparian areas should ensure that management activities would have no adverse effects on groundwater.

Alternative A

Flow regime would remain essentially the same. There is a potential for slight decreases in flows of mainstem reaches immediately upstream from the Three Lynx powerplant, due to possible diversions of tributary streams outside of the corridor (subject to project-specific analysis of proposed additions to PGE's Oak Grove project).

Under this alternative, water quality would remain stable or decrease somewhat from current levels. Recreation within the watershed will increase over time as population increases in adjacent areas outside of the National Forest boundary. Reconstruction of trails and closing of existing dispersed use camping areas where resource damage is presently occurring would decrease sediment inputs to the river from existing problem areas. However, higher levels of recreation in the watershed could increase the number of user-created trails and streambank and riparian damage, leading to increased bank and soil erosion, sediment input to the river, trash, and bacterial contamination.

Private land adjacent to the Clackamas River at Austin Hot Springs would remain in private ownership, but development and/or rehabilitation of this disturbed site would remain uncertain. The disturbed area would continue to be a source of sediment, diminishing over time as the area becomes revegetated.

Additions of large woody debris and other instream fisheries habitat improvements on the river and tributaries could cause short-term increases in sediment and turbidity during placement. Short-term bank erosion caused by deflecting flows into banks and re-shaping stream beds could cause short-term increases in sediment input. Long-term benefits associated with such activities would include increased stream channel stability and decreased sediment input and transport.

Timber harvest and roads in the watershed would continue to contribute sediment and runoff to the Clackamas River. Assuming the level of harvest would remain near current levels, no change in water quality would be expected. Timber harvest within the river corridor could result in minor, site-specific and short-term increases in sediment input. Existing Forest Plan Standards and Guidelines, including implementation of Best Management Practices for the protection of water quality, should minimize adverse effects.

Alternative B

The flow regime would remain essentially the same as that described for the effects of Alternative A. Since this alternative focuses on enhancing ecological and cultural resource values, with relatively less emphasis on increased recreational or commercial development, consumptive uses of water would remain near present levels. Diversion of tributary streams for hydropower development beyond existing levels would be discouraged. Flows in tributary streams within the corridor would be maintained.

Water quality would improve under this alternative. A focus on watershed enhancement would improve existing conditions and favor increased water quality. Public access and recreation would be allowed only when it does not conflict with resource values. Reconstruction of trails where necessary, closing dispersed use camping areas where riparian damage is occurring, discouraging camping within 100 feet of the stream, and closing and rehabilitating unimproved access roads within riparian areas would reduce sediment and trash additions to the river. Bacteria, sediment, trash, and other pollutants would be reduced by providing facilities at designated parking locations and recreation sites. Environmental education and interpretation could reduce the potential for water quality and riparian area degradation associated with visitor use.

Restoration of damaged riparian areas and wetlands, and promoting retention of large woody debris in the channel would improve water quality in the long-term by improving stream stability and the ability of the channel to handle high flows. Watershed enhancement opportunities would be identified, funding sources sought, and projects implemented, resulting in decreases in sediment and other non-point source pollutants.

Relative to all other alternatives, there would be a reduced risk of water quality degradation associated with facilities development, road construction and maintenance. Short duration, relatively minor localized impacts would occur during construction, rehabilitation, and maintenance, but overall long-term water quality impacts would be reduced.

The risk of water quality impacts associated with timber harvest activities within the corridor would be reduced. Restoration of wetlands and riparian areas and emphasis on achieving old-growth riparian characteristics would reduce the risk of erosion and sedimentation and would possibly reduce water temperature as shade canopies are restored along some stream reaches.

Alternative C

The flow regime would remain essentially the same as that described in Chapter 2 and for the effects of Alternative A. Since this alternative focuses on increased recreational and economic development, consumptive uses of water would be expected to increase as campgrounds and other facilities are upgraded to accommodate greater numbers of users and provide higher levels of service (possible additions of flush toilets, recreational vehicle hook-ups, etc., at some locations). Water withdrawals from surface and groundwater sources in the watershed would likely increase slightly but would have little effect on summer low flows. Moreover, overall consumptive use increases would be minimal due to the limited potential for substantial increases in resident population within the watershed.

Diversion of tributary streams for hydropower development beyond existing levels would have to be consistent with need to protect or enhance identified ORVs. Flows in tributary streams within the corridor would be maintained.

The recreational and economic development focus of this alternative would promote increased highway, trail, campground, and other public access development. This increased development would increase the potential for soil erosion and surface runoff from roads, parking areas, trails, and recreation sites. Increased streambank and riparian damage accompanied by reduced bank stability would increase inputs of sediment, trash, bacteria, and other potential contaminants. However, increased patrols, rehabilitation of identified erosion/sediment problem areas, reconstruction and upgrading of recreational sites and sanitation facilities, and public education could mitigate increased visitor use and potential pollution problems.

The risk of water quality impacts associated with timber harvest activities within the corridor would be reduced.

Alternative D

The flow regime would remain essentially the same as that described for the effects of Alternative A. This alternative focuses on accommodating, rather than promoting, higher levels of recreational and economic development than currently exist. Water uses would be expected to increase over present levels as campgrounds and other facilities are upgraded to accommodate slightly greater numbers of users. Water withdrawals from surface and groundwater sources in the watershed would probably increase slightly but would have little effect on summer low flows. The amount of increased water use would be less than that expected for Alternative C, but more than would likely occur under Alternatives A and B.

Diversion of tributary streams for hydropower development beyond existing levels would have to be consistent with need to protect or enhance identified ORVs. Flows in tributary streams within the corridor would be maintained.

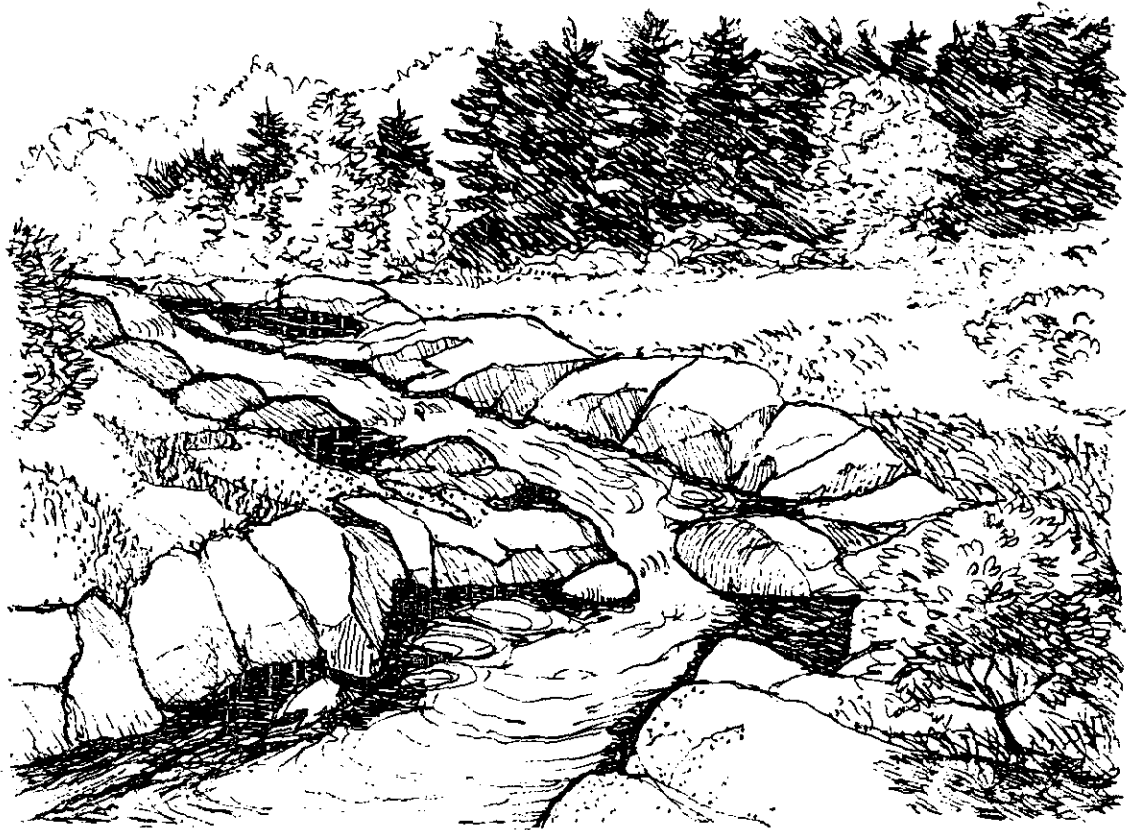
Water quality would be maintained or improved under this alternative. While recreation use would continue to grow, water quality impacts associated with the increased use would stay the same or be reduced through a combination of education/interpretation, access control, and facility improvement. Facilities development and maintenance, and road construction and reconstruction would more likely keep pace with targeted user demand and needs and would be less driven by economic development considerations.

Restoration of damaged riparian areas and the retention and addition of large woody debris in the stream channel would improve water quality in the long-term by improving stream stability, and the ability of the channel to handle high flows.

“Scaled-down” highway design would result in a lower risk of water quality degradation associated with new highway construction and reconstruction within and adjacent to the river corridor as compared to Alternative C. The risk of water quality impacts associated with this activity would be somewhat greater than that expected for Alternative B.

The effects of timber harvesting activities within the watershed would be similar to those described for Alternative B. No change in water quality would be expected.

The Narrows



Alternative E

The flow regime would remain essentially the same as that described for the effects of Alternative A. Since this alternative focuses on enhancing ecological and cultural resource values in the upper corridor (above the confluence with the Collawash River) and places an emphasis on increased recreational or commercial development in the lower corridor, consumptive uses of water would increase slightly, similar to Alternative D. Diversion of tributary streams for hydropower development beyond existing levels would be discouraged. Flows in tributary streams within the corridor would be maintained.

Water quality would improve under this alternative. A focus on watershed enhancement in the upper corridor and facility improvements associated with increased recreational development in the lower corridor would improve existing conditions and favor increased water quality. Reconstruction of trails where necessary, closing and/or stabilizing dispersed use camping areas where riparian damage is occurring, and closing and rehabilitating or stabilizing unimproved access roads within riparian areas would reduce the risk of sediment entry into the river. Bacteria, sediment, trash, and other pollutants would be reduced by providing facilities at designated parking locations and recreation sites. Environmental education and in-

Fisheries

terpretation would reduce the potential for water quality and riparian area degradation associated with visitor use.

The risk of water quality impacts associated with timber harvest activities within the corridor would be similar to that discussed for Alternatives B, C, and D.

Relative to Alternatives A and C, there would be a reduced risk of water quality degradation associated with facilities development, road construction and maintenance. Overall effects would be similar to Alternative D. Short duration, relatively minor, localized impacts would occur during construction, rehabilitation, and maintenance, but overall long-term water quality impacts would be reduced.

Without changes to downstream hydroelectric operations, related hatchery practices, or fishing, current declines in anadromous fish stocks would likely continue. The discussion below focuses on how various management alternatives affect fish habitat capability within the corridor.

Alternative A

Fish habitat capability and fish production increase by approximately 12 percent under Alternative A (Table 4.1). The increases are due to improved riparian conditions required under the Forest Plan and habitat improvement projects in the Clackamas River and stream segments of tributaries that occur within the wild and scenic river corridor.

There are two large riparian areas on the main stem Clackamas River classified as Key Site Riparian Areas in the Forest Plan. Key site riparian areas are notable for their exceptional diversity, high natural quality and key role in providing for the continued production of riparian dependent resource values. The two areas occur at RM 49 to RM 55 and RM 65 to RM 70.5, the Big Bottom area. The Forest Plan directs that key site riparian areas be managed for the inherent productive capacity of riparian areas. Some of the key elements of Key Site Riparian Areas are:

- populations of riparian dependent species are in harmony with capacity of habitat;
- evidence of human activities may be present, but is subordinate to riparian characteristics;
- dynamic multi-age plant communities promote floodplain, bank, and channel stability, provide resiliency to disturbance, and promote aquatic diversity;
- soil, water, fish, and wildlife management activities predominate; and
- excellent fish spawning and rearing habitat. Fish habitat within the boundaries of these two KSRs is expected to improve through time.

The amount of large woody debris (LWD) would remain low throughout most of the main-stem length. The negative effects of the rip rapped banks along Highway 224 and Forest Road 46 would continue to prevent reestablishment of riparian vegetation, precluding long-term input of LWD and improvement of fish habitat in those stretches.

The habitat improvement structures provide the nucleus for increasing habitat complexity in a given stretch of river. Structures tend to become more complex in time as they collect floating debris and serve as anchors for natural inputs of LWD. Under Alternative A, the increase in complexity in the long-term would be slight.

Some of the dispersed use sites located adjacent to the river would be rehabilitated. The rehabilitation would consist of blocking vehicle access to the sites and reestablishing vegetation. The objective would be to restore the rehabilitated sites to a naturally functioning condition.

Other dispersed use sites would remain open and there would be long-term negative effects. The negative effects would be both site-specific and cumulative due to the large number of sites next to the river. The negative effects include: reducing the interaction between riparian and aquatic environments, reducing potential sources of LWD in the future, reductions in water quality due to uncontrolled disposal of human waste, and increased runoff of sediment-laden water from the compacted soil areas. The number of sites is expected to increase and the degree of degradation at each site is expected to get worse as use in the corridor increases in the future.

The increases in LWD in the channel and habitat complexity associated with instream habitat improvement would also benefit amphibians such as Cope's giant salamander and red-legged frogs. This in turn benefits riparian dependent species such as otter and osprey that prey on fish and amphibians.

Alternative B

Alternative B provides the largest increases in smolt habitat and legal trout habitat capability. Alternative B provides a 17 percent increase in future outputs of anadromous fish above Forest Plan levels, or a 29 percent increase over current levels.

The increases in anadromous and resident trout production result from improved riparian conditions. The improved conditions result from an extensive rehabilitation and restoration program in riparian areas. The rehabilitation includes reestablishing vegetation along the riprapped banks and incorporating high concentrations of LWD in 10 miles of the mainstem. The resulting habitat conditions under Alternative B consists of high concentrations of LWD, resulting in increased pools and habitat complexity. This would benefit late-run coho salmon and anadromous fish in general.

The habitat complexity and composition in reach 6 would be improved the most under this alternative. Numerous logs would be incorporated into the channel and the wetlands and side channels blocked by Forest Road 46 would be reconnected and restored. Under Alternative B, there would be large increases in habitat complexity due to the extent of channel coverage allowed and due to the number of structures incorporated into the channel.

Most of the dispersed use sites negatively affecting the structure and function of riparian areas would be rehabilitated. Rehabilitation would consist of blocking vehicle access to riparian areas and revegetating denuded sites. In addition, side channels would be reconnected to the mainstem. Extensive controls on future use of dispersed use areas would negate the long-term negative effect of increased use in the corridor in the future.

The spin-off benefits to riparian-dependent species such as amphibians and river otter would be greatest under Alternative B.

Alternative C

Alternative C results in a 9 percent decrease in habitat capability, compared with Alternative A or a 3% increase over current levels. Most of the reduction results from eliminating instream habitat improvement projects. The resulting habitat composition would be less complex than under Alternative A. Late-run coho production would be less than under Alternative A.

The potential for increasing the habitat complexity and creating habitat preferred by late-run coho salmon is low under Alternative C because of the dependence on natural events and input of LWD. This is compounded by the constriction of the channel by Road 46 and the rip rap. Constricting the channel increases the velocity of water through a given area, decreasing the potential for LWD to deposit in that stretch.

Few dispersed use sites would be rehabilitated. The structure and function of those sites would continue to be degraded and probably get worse in the future. Habitat complexity would decline in the localized areas. The negative cumulative effect of the dispersed use sites would be greatest under Alternative C. Side channels would not be created in these areas, which further aggravates anadromous habitat capability. The long-term negative effect of increases in the number and extent of degradation of dispersed use sites would be greatest under alternative C.

The increase in the stocking of hatchery summer steelhead and catchable rainbow trout and the creation of a rearing facility in the upper river which are a part of this alternative, are contrary to ODFW's Clackamas River Subbasin Fish Management Plan.

The armoring of banks for recreation/tourism-related development would negatively affect adjacent riparian areas.

There would be few secondary benefits to riparian-dependent species.

Alternative D

Alternative D has the same effect on smolt habitat capability and legal trout habitat capability as Alternative A or a 12% increase over current levels. This is due to the close similarities to structure design and density as proposed under Alternative A. Limiting the structures to 50 percent of the channel width limits the effectiveness in creating the slack water areas preferred by juvenile late-run coho salmon. The structures under Alternative D would be less effective at enhancing the late-run coho salmon habitat than Alternatives B and E.

Some benefits would accrue to anadromous fish by rehabilitating the most degraded dispersed use sites and creation of side channels through some of the rehabilitated sites. There would be a moderate negative long-term effect of the increase in the number of and extent of degradation of dispersed use sites in the future. The negative cumulative effect would be moderate because some of the dispersed use sites would be rehabilitated.

There would be some benefits to riparian dependent species through introduction of LWD.

Alternative E

Alternative E results in a 5 percent increase in smolt habitat capability and a slight increase in legal trout habitat capability above Forest Plan levels or a 17% increase over current conditions. The increase is due to increased habitat complexity due to improving fish habitat in 12 miles of the river and is due to the increased density of structures in a given stream segment.

Alternative E provides for a slight increase in habitat complexity compared to Alternative A. Installing structures that span up to 75 percent of the channel width more effectively influences the channel hydraulics to effect changes in habitat complexity compared to the 50 percent limitation under Alternative D. Also, the structures would become more complex in time as natural LWD concentrates at structure sites. The natural increase in complexity at structure sites would occur more rapidly and to a larger extent under this Alternative compared to Alternative D because of the greater coverage in the channel. A log spanning 75 percent of the channel has a greater chance of trapping moving debris than one spanning 50 percent.

Recreation and Public Use

Riparian conditions would be improved with the rehabilitation of a large number of dispersed use sites and creation of side channels through those sites. The benefits of rehabilitating the dispersed use sites would accrue over many decades. The negative effects of dispersed use sites on fish habitat and production potential would be low under this Alternative. It is low because most of the dispersed use sites would be rehabilitated and the creation of new sites in the future would be more strictly controlled than under Alternatives A, C, and D. The negative cumulative effect of the number of dispersed use sites and extent of degradation at each site would be low.

Anadromous fish, particularly late-run coho salmon, would benefit from the creation of slack water areas preferred by newly emerged fish and juvenile late-run coho salmon.

Cope's giant salamander would benefit from the increase in quantity of LWD in the Clackamas River and red-legged frogs would benefit from the creation of slack water areas in the side channels.

Proposed management actions affect visitor use facilities, services, and settings, future use levels and the long-term ability of the corridor to accommodate these uses. Effects vary by the level and character of development allowed (ROS classification); by the type, extent, and location of new or rehabilitated recreation facilities; and, in turn, by potential impacts to facilities or uses brought about by proposed management actions.

Table 4.1 includes a summary of the relative proportion of the corridor within the various ROS classes, and preliminary conclusions regarding overall effects on the ability of the corridor to accommodate specific types of uses. Also included are broad conclusions regarding administrative requirements and the long-term potential for recreation use conflicts.

Alternative A

In general, implementation of the Forest Plan would likely change existing conditions only slightly. Small net increases in the number of overnight and day use units would likely occur, as well as two new trail segments below Fish Creek. Improvements to river access are identified, but specifics on scale, character, and location are limited. Use of some dispersed camping areas would likely be limited, and no changes in user regulation would occur. No specific guidance or strategy would be available for interpretive development.

Management of whitewater use under past decisions would be inconsistent with the Wild and Scenic Rivers Act, due to no defined limit or carrying capacity. There would continue to be inconsistencies in interpretation of appropriate development scale within the corridor, due to the broad definition and application of ROS classifications.

Public use in the corridor would continue to increase, with facility and roadway improvements likely inducing demands that would aggravate carrying capacity concerns in the long run.

Specific effects on carrying capacity are difficult to assess, as specific facilities or activities are not often addressed. It may be assumed, however, that the identified rehabilitation and construction would likely increase opportunities for hiking and RV camping. Roadway expansions could better accommodate bus tours farther up the corridor, but associated developments are not identified. Tradeoffs of improved roadways are that higher speed traffic could increase potential safety concerns and aggravate roadway-related noise concerns at adjacent camping and trail areas. Although bike lanes would be provided, increased traffic speeds, and potential resulting encroachment into adjacent recreation areas would likely negate overall benefits to recreation opportunities.

Alternative B

Alternative B provides the least amount of new facilities, and the highest reduction in existing overnight capacity. Implementation of concession management may reduce administrative costs, and a reservation system could reduce campground use “spillover” into dispersed sites, thereby reducing overall unmet demand.

On a corridor level, Alternative B results, overall, in the least “urban” level of development, in comparison to other Alternatives.

Although traffic would likely increase on main corridor roadways, lack of expansion and straightening may result in less roadway-related impacts to recreation facilities and uses, in comparison to other Alternatives.

Near Indian Henry



Effects to bank fishing would likely parallel proposed enhancements to anadromous fish habitat and reduced stocking of resident trout. Improved access at some day-use sites, as well as a less “urban”, less congested corridor overall, could enhance fishing opportunities as well. Boating use would not increase beyond recent levels, with private trips accounting for all use. Regional demand for guided trips would not be met on the Clackamas.

Camping opportunities would be reduced due to reductions in camping facilities, conversion in use of dispersed camping areas, and development of trail-associated opportunities. Proposed changes in trail use regulations would reduce mountain biking opportunities, but reductions would be offset by new multi-user trails. Road and facility standards would not likely encourage bus travel in the corridor, and a low scale of roadway-related development would provide limited adjacent attractions. A natural corridor, and a slower, meandering trip could benefit sightseers in passenger vehicles, though stays would likely be shorter than under the other alternatives allowing more roadway-related development.

Big game hunting opportunities would be affected by proposed road closures. Populations would not likely increase at the rate in other alternatives (in response to intensive management).

Alternative C

Implementation of Alternative C would result in the greatest amount of facility development, as well as the most "urban" corridor, overall.

Fishing opportunities would be enhanced through construction of a drift boat launch, and through increased stocking, but lack of fish habitat enhancement work could ultimately reduce anadromous fishing opportunities.

Kayaking opportunities above the Collawash could be enhanced due to actions necessary to bring existing structures into conformance with maximum allowable cross-channel span. Rafting levels could increase significantly, but increased commercial (and overall) levels could negatively impact social carrying capacity for private boaters. High levels of development and access enhancement would likely increase lesser-skilled boater activity.

Interpretive opportunities would be fully developed under this alternative (including higher allowed levels of on-site development). Increased traffic and overall development levels may result in less wildlife to view in the corridor. Hiking opportunities would increase, but user conflicts would likely increase due to multiple users, and lower thresholds for acceptable contacts, in comparison to other alternatives.

Camping-related opportunities are primarily related to changes in levels of facility development, both within and beyond the corridor, as well as distribution of target users. Fishing-related camping would be increased through proposed stocking and habitat enhancement structure locations. Camping in dispersed sites would only be slightly affected by required modification to some riparian zone use areas (RV use most highly, due to more limited availability). Equestrian camping, whether developed or dispersed, could increase due to development of such opportunities associated with the urban link trail.

On-road bicycling opportunities are increased by potentially wider traffic and bicycle lanes associated with highway development. Some gains, however, could be offset if higher traffic speeds/levels result. Off-road bicycling opportunities could increase with associated trail development, assuming multi-user levels did not reach the point that alternate routes for bikes would be needed. Horse riding opportunities would increase due to proposed roadway development. Hunttable wildlife populations would likely benefit from a high level of big game forage management.

Alternative D

Implementation of Alternative D would result in levels of allowed and proposed facility development approximately midway between Alternatives B and C. There would be no enhancement of drift boat fishing; moderate habitat enhancement efforts would contribute to anadromous fishing. Improved access (although no change in stocking levels) could positively impact trout fishing.

Kayaking opportunities would be slightly reduced, due to additional fish structure placement in the portion of river above the Collawash. Allowed rafting levels would not likely approximate the levels determined under objectives for Alternative C, and commercial levels would likely be much lower than specified there.

Changes in interpretation, wildlife observation, hiking, camping, and others, would follow the factors described for the Alternative C, although resulting levels may differ slightly.

Alternative E

Implementation of Alternative E would result in additional development focused below Forest Road 57, and a more primitive corridor (in comparison to Alternatives C and D) upstream.

Fishing opportunities (drift boat and anadromous-bank) would increase somewhat over Alternative D, and trout fishing would be reduced with stocking levels. Kayaking above the Collawash would be impacted slightly more than in Alternative D, due to a greater allowed span for fish structures.

Alternative E would result in more stringent controls over dispersed use areas. Since RV camping and group camping typically require and create larger, flat areas, as well as full motorized access, it is likely these uses would be hardest hit by areas selected for closure. As in Alternative D, changes in interpretation, wildlife observation, hiking, and others follow factors described previously, with slightly different results in some cases.

Specific projects initiated to implement this plan may result in minor and localized impacts to threatened or endangered species. A project specific biological assessment would be completed for each project. Biological evaluations would be completed where sensitive species are present.

Wildlife

Alternative A

This alternative maintains the river close to current conditions. Road expansions could be expected to further impact riparian and old-growth habitats. Proposed water diversions, if implemented, would reduce the quality and quantity of habitat available to aquatic organisms, as well as to elk, mink, beaver, osprey, marten, fisher, and various amphibians.

Additional fragmentation could occur in some areas.

Road closures and rehabilitation projects could reduce harassment and provide better habitat for a variety of species. Where uneven-age select harvesting is practiced, some impacts to wildlife from roads and skid trails would be expected.

Alternative B

Connectivity between currently fragmented old-growth stands could improve, with positive benefits to species like spotted owl, pileated woodpecker, bobcat, and pine marten. Further fragmentation from timber harvesting would be avoided. Existing riparian and old-growth habitats along Road 46 would be protected from new road construction.

Additional impacts to aquatic organisms and riparian-dependent species from water diversions would probably be minimal.

Forage for deer, elk, and other species reliant upon early successional stages would be limited to naturally-occurring openings such as meadows and to areas where blowdown or fire opens the canopy.

Impacts from recreational use would be less under this alternative. Area road closures in the Big Bottom and Mag/Tag Creek areas would help protect high quality old-growth and riparian habitat from degradation and would protect elk in sensitive wintering areas.

Populations of threatened, endangered, and sensitive species may increase. This alternative includes a strong measure of protection for breeding amphibians and their habitats.

Fish projects could boost fish populations, with accompanying benefits to bald eagle, osprey, otters, and bears. Opportunities to view fish-eating carnivores may increase. Developed watchable wildlife sites would increase awareness of riverine wildlife and provide for environmental education opportunities.

Alternative C

An influx of recreational hikers, bikers, campers, fishers, hunters and rafters would negatively affect species such as beaver, fisher, mink, and frogs.

Increasing numbers of trophy elk could require limiting elk hunting elsewhere on the districts and throughout the Santiam unit. Forage for deer, elk, and other species reliant upon early successional stages would occur in naturally-occurring openings such as meadows and to areas where wind damage or fire opens the canopy.

Conflicts between hunters and other recreationists may increase.

*Osprey Nest Along
Clackamas River Trail*



The roadway expansions would further reduce riparian and old-growth habitats. Beaver activities may be curtailed if impounded water threatens recreational activities.

Connectivity between currently fragmented old-growth stands could improve, with positive benefits to species like spotted owl, pileated woodpecker, bobcat, and pine marten.

Development of watchable wildlife sites would increase awareness of sensitive wildlife in the corridor and provide for environmental education opportunities.

Alternative D

Additional impacts to aquatic organisms and riparian associates resulting from water diversions would probably be minimal. However, beaver activities may be curtailed if impounded water threatens recreational activities.

Forage for deer, elk, and other species reliant upon early successional stages would occur in naturally-occurring openings such as meadows and to areas where wind damage or fire opens the canopy.

Connectivity between currently fragmented old-growth stands could improve, with net positive benefits to species like spotted owl, pileated woodpecker, bobcat, and pine marten.

Additional recreational pressures may have negative effects. However, development of watchable wildlife sites would increase awareness of sensitive wildlife in the corridor and provide for environmental education opportunities.

Area road closures in the Big Bottom and Mag/Tag Creek areas would help protect high quality old-growth and riparian habitat from degradation and would protect elk in sensitive wintering areas. This alternative includes a strong measure of protection for breeding amphibians and their habitats.

Fish projects could boost fish populations, with accompanying benefits to bald eagle, osprey, otters, and bears. Opportunities to view fish-eating carnivores may increase. Developed watchable wildlife sites would increase awareness of riverine wildlife and provide for environmental education opportunities.

Alternative E

Additional impacts to aquatic organisms and riparian associates resulting from water diversions would probably be minimal. However, beaver activities may be curtailed if impounded water threatens recreational activities.

Increasing numbers of trophy elk could require limiting elk hunting elsewhere on the districts and throughout the Santiam unit. Forage for deer, elk, and other species reliant upon early successional stages would be limited to naturally-occurring openings such as meadows and to areas where wind damage or fire opens the canopy.

Connectivity between currently fragmented old-growth stands could improve, with positive benefits to species like spotted owl, pileated woodpecker, bobcat, and pine marten. However, additional fragmentation would not be specifically prohibited.

Development of watchable wildlife sites would increase awareness of sensitive wildlife in the corridor and provide for environmental education opportunities.

Road 46 expansions would further reduce riparian and old-growth habitats. However, area road closures in the Big Bottom and Mag/Tag Creek areas would help protect high quality old-growth and riparian habitat from degradation and would protect elk in sensitive wintering areas.

This alternative includes a strong measure of protection for breeding amphibians and their habitats.

Fish projects could boost fish populations, with accompanying benefits to bald eagle, osprey, otters, and bears. Opportunities to view fish-eating carnivores may increase. Developed watchable wildlife sites would increase awareness of riverine wildlife and provide for environmental education opportunities.

The effects of each alternative on unique, sensitive, threatened, or endangered plant species and their habitats would vary according to ground disturbance, fluctuations in water regimes, and changes to substrates. Each proposed project (fish habitat improvement structures, campground development, vegetation management, logging activities, and road construction) would include site specific surveys for unique, sensitive, threatened or endangered plant species and their habitats. Mitigation measures for each project would be developed to provide for the protection of habitat for sensitive, threatened or endangered plant species. Activities to enhance plant habitat could involve planting native species, prescribed burning in special habitats (e.g., oak uplands) and control of noxious weed species that displace native vegetation. Interpretive facilities along the river would allow for viewing without impacts to populations or habitats, perhaps accomplished through the use of low impact trails and boardwalks in sensitive areas.

Alternative A

Proposed projects would meet Forest Plan Standards and Guidelines for sensitive, threatened, and endangered plant species. Site specific mitigation measures would be implemented as needed. Possible mitigation measures for ground disturbing activities would include adequate riparian zone buffers and control of noxious weed species.

Alternative B

Same as Alternative A but would emphasize restoration and enhancement of plant communities. Riparian restoration could include reconnecting wetlands and headwater tributaries that were separated by road construction, planting of native species and seed mixes, and enhancing sensitive, threatened, and endangered plant habitat. Recreational use would be concentrated in areas of low impact and self-guided interpretation would be encouraged. This alternative would have the least impact on plant communities along the river.

Alternative C

Emphasis in this alternative would be placed on recreational demands and the encouragement of tourism-related growth. Although mitigation measures for each project proposal would be the same as in Alternative A, the impacts from the increase in recreational activities will be difficult to adequately mitigate. The risk to plant communities within the corridor due to greater public use would increase. Noxious weed species may also have a greater potential for establishment. Opportunities for forest products (mushrooms, beargrass, floral greens, etc.) would be actively managed. This alternative would have a greater impact on plant communities along the river than under Alternative A.

Alternative D

Same as Alternative A. Dispersed recreation sites within the riparian zone could be rehabilitated if habitat impacts are occurring. Effects to plant communities along the river corridor would be less than in Alternative C, as recreational development will be limited.

Alternative E

Same as Alternative A. This alternative would have a low impact on plant communities along the river.

Cultural Resources

The effects of activities under each alternative would vary in most cases according to the depth of ground disturbance. Those that disturb the most soil have the greatest probability for displacing archaeological deposits. The effects on above-ground cultural resources would also vary according to each alternative. A cultural resource survey would be required for any proposed activity.

Alternative B would have the least impact on cultural resources from human activities. Alternative C would have the highest probability for impacts to cultural resources due to the emphasis on recreational development. More site monitoring and protection would be necessary. Increased site interpretation may offset somewhat the expected impacts by increasing public awareness to the "non-renewable" nature of cultural resources. Some sites may be disturbed or destroyed through project activities such as campground construction.

Alternatives A, D, and E would have a lesser impact than Alternative C. However, formal monitoring and site protection would be less in these Alternatives, because of the lower potential for ground disturbance.

The cumulative effects would be variable and in most cases a continuation of short-term effects. Greater numbers of people would probably cause more site disturbances and in some cases total site destruction. Natural processes would have the biggest impact on above-ground cultural resources such as buildings and culturally modified trees.

Scenic Resources

Changes to scenic quality in the river corridor and its viewshed result from such activities as highway improvements, timber harvest, recreation development, wildlife habitat enhancement, utility development, and landscape restoration. All of the alternatives propose projects in some or all of these categories.

The single most important aspect affecting scenic quality in the corridor is road development and maintenance, including State Highway 224, and Forest Roads 46 and 4690. This is particularly true in the "recreational" segments, where the road and river share a narrow, canyon landscape. As the road template is widened (to accommodate increasing amounts of traffic) land disturbance adjacent to the road increases as well. Wider roads accommodating higher speeds often result in more guardrails, retaining walls, wider clearing limits, and other unnatural features. Consequently, alternatives that call for limits on highway development should result in relatively higher levels of scenic quality. Alternative B is the most explicit in limiting highway development.

Timber management also can affect scenic quality, particularly in the viewshed that lies outside of the corridor. All alternatives provide scenic resource protection, with Alternative B providing the highest level.

Recreation development also affects scenic quality by introducing more roads, buildings, clearings, signs, kiosks, and vehicles into the corridor. Alternatives that limit development would result in more natural appearing scenery, but make access to this scenery more difficult.

Wildlife habitat improvements also can affect scenic quality to some extent. Fish structures that are poorly designed or located can detract from the natural landscape. Snags left in timber openings can be intrusive if placed at the skyline of a ridge, such as on Fish Creek Divide. Forage seeding introduces non-native grasses that often out-compete more attractive native wildflowers. Conversely, efforts to maintain old-growth habitat (Alternative B) should result in gradual improvement to scenic quality, and the presence of more wildlife (such as spawning salmon or grazing elk) contributes to the visual richness of the corridor.

Future utility development is not expected to occur under any of the alternatives being considered. However, maintenance of existing utility corridors, replacement or re-routing of towers and lines, and other activities could occur that might affect scenic quality.

All of the alternatives can be expected to maintain the mostly natural appearing landscape that exists today. There are specific features of each alternative that would change the existing landscape somewhat, by either introducing more human-made elements or by restoring natural features.

Alternative A

Roads

Under Standards contained in the Forest Plan, new roads (and by inference any changes to existing roads) would not dominate the natural landscape where Retention (R) and Partial Retention (PR) visual quality objectives (VQO's) are prescribed. Curvilinear alignments that flow with the natural contours of the landscape would be maintained. Rock cuts and roadside grading would be done to be natural appearing, consistent with safety and maintenance concerns. Guardrails, signs, culverts, bridges, and retaining walls would attempt to blend with natural features.

Effects to scenic quality under this alternative depend largely on the scale of the road design selected, as well as on adherence to design guidelines. Projected traffic levels appear to be resulting in a highway designed for a 45 mph speed; thus, the scale of the highway can be expected to increase over what exists at present.

All of the projects are expected to meet VQO's of at least Partial Retention, as viewed from the highway, river, and associated recreation areas, assuming visual objectives supersede roadway standards where necessary.

Timber Management

Current Forest Plan Standards call for timber management activities in scenic river segments to meet Retention in the foreground (within 1/2-mile from the viewer) and Partial Retention in the rest of the seen area. Recreational river segments are Partial Retention in the entire seen area. The Forest Plan also contains visual quality objectives for certain roads which have high visual sensitivity. Highway 224 and Road 46 are two roads which have a retention VQO in the foreground and partial retention for the rest of the seen area. The viewsheds as seen from the river and roads overlap, and the most restrictive objective applies.

Other Projects

Recreation, administrative, wildlife enhancement, or utility projects would be designed to blend into the existing landscape character, meeting partial retention in most cases.

Alternative B

Roads

Road expansion would not be demand-driven under this alternative. Road templates would be kept as narrow as possible, consistent with safety concerns, resulting in smaller disturbed areas adjacent to the road, and fewer turnouts. Restoration of existing disturbed areas adjacent to the highway, including much of the rip rapped banks, would also contribute to a more natural appearance.

Timber Management

The reduction of timber harvest within the corridor, and upgrading the visual quality objective to retention in the viewshed outside of the corridor, would result in improved scenic quality over time. The old-growth character would be retained. Timber harvest would be primarily uneven-age, or selection harvests, although some small and inconspicuous clearcuts could occur.

Other Projects

Limits on recreation development and expansion would contribute to a more natural appearing river corridor. Closing some existing sites would do the same. Extensive fish habitat improvement projects in the mainstem of the Clackamas could detract from scenic quality. Careful design and implementation would mitigate this to some extent. Restoration of riparian areas would improve scenic quality as would planting willows and other native shrubs in the rip rap along Highway 224 and Road 46. Closing some dispersed use areas could result in additional parking along the road which would create a "crowded" appearance.

Alternative C

Roads

This alternative would be similar to Alternative A in terms of effects to scenery, but would place greater emphasis on the highway as a scenic road. This would result in more public services and facilities, including more scenic turnouts, interpretive signs, and wildlife viewing areas. The highway would be designed with a wider template than in Alternative B, with bike lanes constructed further up the corridor. Scenic Byway designation would place greater emphasis on the viewing experience from the highway. The design quality of roadside facilities would be high due to expected increases in capital investment funding and partnership opportunities.

Timber Management

All alternatives eliminate scheduled timber harvest from the corridor itself, but allow for harvest for enhancement of river values and public safety. The viewshed beyond of the corridor would be managed as in Alternative A.

Other Projects

Additional facilities expected to occur under this Alternative would result in a more "developed" appearance to the corridor. Design standards that emphasize natural materials and color would help to such facilities as restrooms, kiosks, and shelters into the natural setting. The landscape would still be natural appearing, but visitors would encounter greater numbers of facilities as they travel through the corridor. The overall setting could become more "park-like," particularly if maintenance activities increased as a result of partnerships with agencies, recreation groups or businesses. Emphasis on watchable wildlife opportunities would provide an additional "visual experience" for the visitor.

Alternatives D and E

These alternatives would result in similar effects to scenic quality, in that they both emphasize recreation development and conveniences downstream from the Oak Grove Fork, while maintaining a more natural setting upstream. This is consistent with the existing condition of the corridor.

Roads

The road template in the lower section of the river would likely be developed to the standard described under Alternative A. Scenic Byway designation would not result in much development of user conveniences in the upstream section. Above the Oak Grove Fork, the highway would remain narrow, possibly below design standards for the volume of traffic.

Timber Management

Similar effects as in Alternative C.

Geology

No significant changes would occur to the geology along the Clackamas River under any of the five management Alternatives. Natural geologic processes would continue to operate. Small portions of the huge earthflow complexes in segments 4 and 5 would continue to slowly move downslope into the Clackamas River. Any management activities that did occur within the earthflows would be designed to not accelerate the movement of the earthflows. Minor landsliding, debris flows, and surface erosion along the rest of the river corridor would continue to introduce small amounts of sediment into the river.

Minor amounts of soil displacement and erosion would continue to occur from road surfaces, cut slopes, fill slopes, trails, and campgrounds.

There would be no change in environmental effects from mining activities under the 1872 Mining Law and the mineral leasing laws since restrictions governing those mineral activities would continue unchanged under all five Alternatives. Locatable minerals would be recommended for withdrawal from development within the scenic and recreational river segments on National Forest land. Mineral leasing permits would continue to be allowed on public lands along the river. There would continue to be a "No Surface Occupancy" stipulation for that portion of the permit potentially affecting river resource values. New common variety mineral development (e.g., sand and gravel) would not be permitted within any of the river segments on National Forest land. The two Forest Service rock quarries which are in or near river segment three would continue to be used, consistent with plan objectives.

Access and Travel Management

Alternative A

There would be no special consideration for road expansion, design speeds, or vehicle types other than current engineering standards and Forest Plan direction.

There would be no effect to the current driving experience but there is the potential to improve stretches of the road which currently require a high degree of driver concentration because of road alignment, degree of curvature, pavement condition or shoulder width. Certain road characteristics could affect obtaining additional funds for road improvements.

There would be no special considerations for parking, although there may be an increase in the use of road shoulders for parking. Current strategies for handling an increase in demand (primarily development and traffic management strategies) would continue.

Alternative B

This alternative discourages large recreational vehicles from using the corridor's travel ways. The effect of this is to encourage passenger type vehicles and bicycle traffic along the route, potentially creating a safer travel way.

Traffic in the narrower sections of the existing roadway would be accommodated; however, design standards on the narrower sections would not meet minimum standards for either State or Forest Service design criteria for the current traffic levels.

As traffic volumes grow over the next 10 years, these narrower sections will not accommodate growth as it relates to current traffic standards. Traffic management strategies may be employed to alleviate congestion or safety concerns which develop because of substandard roadways.

There may be less parking along the corridor as hardened areas are reclaimed and no other development takes place.

There would be an increased expenditure of both time and dollars associated with discouraging waste disposal sites within the corridor. Costs would increase if similar volumes of waste disposal materials are stockpiled.

There would be an effect on how maintenance organizations and roadway designers currently approach roadway and bank stabilization projects. Current practices do not include bioengineering or screening of structures for visual considerations. New practices and technology may result in increased initial costs; however, these costs could be offset by the fact maintenance needs decrease when banks and ditches are stabilized.

The absence of Special Roadway considerations like Scenic Byways would have no effect on the current District Highway Designation by ODOT or on current Forest Service designations for FS Road 46. However, there are funds available for Scenic Byway corridors for roadway improvements which would not be available without the designation.

Road closures could result in densities lower than Forest Plan standards. The effect would be reduced maintenance needs. Law enforcement needs could increase for closure monitoring and enforcement.

Alternative C

The roadways within the corridor would accommodate all users. This alternative allows for a shoulder along Forest Service roads which would meet minimum standards for a State Bike Way (a 4-foot shoulder).

Anticipated traffic growth would be accommodated in this alternative. All uses would be encouraged. More areas for parking could be made available for vehicles, including large recreational vehicles.

Maintenance would be affected since emphasis on slope stabilization would shift from continued mechanical ditch clean-up to efforts to stabilize slopes. These methods of slope stabilization would eventually decrease the amount of material needed to be deposited in disposal areas. They also may have increased initial costs.

Scenic Byway designation, if successful, could open additional funding sources for roadway and parking improvements. High development could bring additional traffic to the area.

Alternative D

Under this alternative large recreational vehicles and oversized commercial traffic are accepted along the entire route. Bicycles are encouraged to the Road 46 and 63 junction. This could result in a bike way standard shoulder to this point. Above the 63 junction, bicycle use is accepted and the result could be a standard shoulder which is two feet.

The effects of standards to the roadway development may result in a mix of both development and traffic management strategies. Improvement of narrower sections of roadways to minimum state and Forest Service standards would accommodate anticipated traffic volume growth over the next 10 years.

Maintenance would be affected, since emphasis on slope stabilization would shift from continued mechanical ditch clean up to efforts to stabilize slopes. These methods of slope stabilization would eventually decrease the amount of material needed to be deposited in disposal areas. They also may have increased initial costs.

Road closures could result in densities lower than Forest Plan standards. The effect would be reduced maintenance needs. Law enforcement needs could increase for closure monitoring and enforcement.

Alternative E

This alternative separates the transportation system into two reaches. The first is the area below the junction of FS Road 46 and FS Road 63. The effects of this alternative are potentially the same as Alternative C to the 63 junction. Above the 63 junction the effects are similar to Alternative B with one exception. Large recreational vehicles would be accepted rather than discouraged. This would have little effect to the overall road design parameters for this section of the corridor.

Timber

The effects of the different alternatives on timber management are greatest in terms of changes in timber volume outputs. Alternative A and the Forest Plan provide a "regulated" timber volume output of approximately 650 MBF per year. Alternatives B - E deviate from this because they change the corridor to "unregulated" timber harvest. This means that volume targets would not be computed as a part of the Forest's Allowable Sale Quantity (ASQ). However, it does not imply that timber harvest would not occur within the corridor. Timber harvest may occur if it is designed to protect and/or enhance river values and to ensure visitor safety. This change in the regulated harvest level amounts to a 0.15 percent reduction in the volume output for the Forest as a whole.

In addition to the change described above, Alternative B would also change the visual quality objective outside the corridor. The area seen from the road or river at middle-ground distances would be changed from a Visual Quality Objective of partial retention to retention. This would reduce the Forest's ASQ by an additional 3,700 MBF per year. Short-term reductions could be even greater since some areas would not currently meet the retention objective and harvest may have to be deferred in those areas for many years as plantations recover visually.

Socioeconomics

The major effects of the alternatives related to socioeconomics would be changes in economic opportunities associated with river-related resources and changes in the quality of resources such as scenery and recreation. Economic opportunities are examined by looking at the amount of money which would be paid from Forest receipts to counties and changes in employment and incomes resulting from Forest outputs, receipts and expenditures in the designated river corridor under each alternative. Typically these changes reflect decreases or increases in the amount of timber harvest, and recreation use in the corridor. Non-commodity values such as scenery, old-growth habitat, and wildlife are also considered.

Five criteria were used to evaluate the socioeconomic effects of implementing each alternative: degree of impact on timber-related employment, degree of impact on tourism and service-sector employment, degree of impact on river-related recreation opportunities, degree of impact on counties (Forest Service timber and campground fee receipts) and on communities, and degree of impact on non-commodity values in the river corridor.

Alternative A

No change in timber-related employment; service-related employment would stay the same or increase slightly as a result of low-level recreation development. Forest Service timber receipts to counties* would stay the same as would campground payments. Non-commodity values could increase slightly due to some control of resource damage in many areas along the river but some decrease in scenic quality could occur due to timber harvest and a continuation of current road management practices.

Alternative B

Greatest decrease in timber-related employment, service-related employment would stay the same or decrease slightly as a result of low-level recreation development that emphasizes protection of the environment (and may preempt some recreational activities). Opportunities for subsistence activities such as hunting, wood gathering and fishing would be moderate under the other alternatives but lower under this alternative, and could affect the livelihood of some people in nearby communities. Forest Service timber receipts to counties would decrease the most under this alternative but campground receipts would stay the same. Non-commodity values would increase substantially due to a high level of environmental protection, the phasing out of dispersed use sites and the control of impacts from sport fisheries. Scenic values, cultural resources, old-growth forests, water quality and wildlife would be accommodated the most under this alternative.

Alternative C

Small decrease in timber-related employment; service-related employment could increase dramatically with the provision of more visitor services, bigger sport fishing and hunting programs, outfitter-guide trips, and developed recreation opportunities. Forest Service timber receipts to counties would decrease slightly, and campground payments would increase slightly over time. Highest level of federal expenditures for public facilities and road improvements in the corridor would occur under this alternative. Amenity values could increase somewhat by increasing public education and law enforcement, expanding facilities, and encouraging concentrated use in developed recreation areas, although the sheer volume of visitors may offset gains in non-commodity values in some areas. Economic returns from tourism to the communities of Estacada and Detroit and possibly other communities close to the corridor would be highest under this alternative.

Alternatives D and E

Small decrease in timber-related employment; service-related employment would increase somewhat with the provision of some visitor services, bigger sport fishing programs, and developed recreation opportunities. Forest Service timber receipts to counties would decrease slightly (same as Alternative C), and campground payments could increase slightly over time. A low level of federal expenditures for public facilities and road improvements would occur under these alternatives. Non-commodity values could increase slightly under Alternative D by increasing public education and law enforcement, limiting access to dispersed use sites, and by encouraging concentrated use in developed recreation areas. Under Alternative E, non-commodity values could increase overall because of higher levels of protection for natural values in the upper reaches. Economic returns to the communities of Estacada and Detroit and possibly other communities close to the corridor would be moderate under these alternatives and probably more under E because of the greater emphasis on sport fishing in the lower river.

*Reduced timber harvest will reduce the dollars distributed to local counties for schools and roads by \$0.25 for each dollar of revenue not returned through timber sales.

The interdisciplinary team determined that the five alternatives met all applicable national laws and executive orders with specific direction regarding wild and scenic rivers, and National Forest management. These items included cultural resources, water quality, forest regeneration, scenic quality, air quality, soil productivity and threatened, endangered and sensitive plant and animal species. It was determined that none of these alternatives would have significant adverse effects on the above.

For all alternatives, irreversible and irretrievable commitments of resources would not exceed those discussed in the Final Environmental Impact Statement for the Mt. Hood National Forest Land and Resource Management Plan.

There are floodplains and wetlands within the planning area. Any effects on these are evaluated in this chapter under appropriate sections. There are no prime farmlands or rangeland within the planning area.

Until research findings can resolve some major scientific uncertainties, evaluation of climate changes effects in a document such as this would be speculative.

Native American rights, including those covered by the American Indian Religious Freedom Act, would not be affected. Socioeconomic effects are discussed in the socioeconomic section. Effects on Native Americans, other minorities, and women would be similar to socioeconomic effects on the general population.

Alternative A, the no-action alternative, is in compliance with the Forest Plan. The other alternatives would require an amendment to the Forest Plan before they could be implemented.

Table 4.1 Clackamas National Wild and Scenic River and State Scenic Waterway Comparison of Environmental Effects Across Alternatives

Indicator	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Hydrology and Water Quality					
Water quantity and timing of flow.	Potential for slight decreases in flows of mainstem reaches, due to diversions of tributary streams outside of designated corridor.	Less potential for decreases in flows relative to Alternatives A and C.	Same as A.	Same as B.	Same as B.
Water Quality					
• Water temperature	Mainstem temperature ranges and extremes will remain as described in Chapter 2 for existing levels. State Basin standards will be met.	Potential for slight decrease in summer temperature due to riparian enhancement.	Similar to A.	Similar to A.	Similar to B.
• Sediment	Potential for increased sediment inputs and turbidity related to continued riparian damage (vegetation removal, trampling, erosion, etc.).	Sediment/turbidity levels unchanged or decreased.	Similar to A. Increased recreational use of riparian areas will increase risk of sediment/turbidity. Facility design and other mitigation may maintain present levels.	Similar to A.	Similar to B. Overall decreased risk of sediment / turbidity.
• Disease Organisms	Potential for gradual increase in levels of disease organisms related to riparian use: trash, human waste, erosion, etc.	Decreased levels of disease organisms as human activity is restricted in riparian areas.	Increased potential for disease organisms related to human use of riparian and corridor areas. Facility development at critical locations, as well as education and enforcement will reduce risk.	Similar to A.	Similar to B, especially in upper corridor.

Indicator	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Fisheries					
Miles of anadromous fish habitat improved	Determined on a project basis.	10	0	11	12
• Smolt Habitat Capability Index (SHCI): steelhead coho, spring chinook					
1st Decade	100	100	100	100	100
5th Decade	115	135	103	115	120
• Legal Trout Index (LTI): cutthroat, rainbow					
1st Decade	100	100	100	100	100
5th Decade	110	123	102	110	115
Number of log and boulder structures/1000 feet of treated stream	Not specified	>15	0	10-15	>15
Habitat complexity upstream of Collawash	Slight increase	Large increase	Large decrease	Slight increase	Moderate increase
Late-run coho					
• Production potential	+12%	+29%	+3%	+12%	+17%
Recreation and Public Use					
Character and extent of allowed development (as defined by approximate percent of corridor within various ROS classes):					
"Rural" ROS Class	0 percent	0 percent	31 percent	0 percent	31 percent
"Roaded Natural"	57 percent	50 percent	19 percent	50 percent	19 percent
"Semi-Primitive Motorized"	43 percent in either SPM or SPNM	26 percent	50 percent	28 percent	28 percent
"Semi-Primitive Non-Motorized"	(see above)	24 percent	0 percent	22 percent	22 percent
Forest Service Administrative Requirements/Costs					
• Facility Operation and Maintenance	Moderate continual increase	High decrease	Slight net decrease	Slight-moderate net increase	Slight net increase
• Recreation Special Use Administration Compliance	Not applicable	Low-moderate	High	Moderate	Moderate-high
• Other Law Enforcement	Continual increase	Moderate-high increase	High increase	Moderate increase	Moderate to high increase
Overall Potential for User Incompatibility/Conflict	High	Low	High	Moderate	Moderate

Indicator	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Wildlife					
Probability of increasing habitat available for old-growth associated species.	Low	High	Moderate	Moderate	Moderate
Post-harvest levels of snags and down logs.	Low	Moderate-high	Low	Moderate-high	Low
Protection and enhancement of riparian obligates (beaver, osprey, otter, eagle, frogs, waterfowl) and habitat.	Moderate	High	Moderate	Moderate-high	High
Availability of open forage areas in the future.	Moderate	Very low	Low	Low	Low
Probability of increased future disturbance to wildlife populations.	Moderate	Low	High	Moderate	Moderate
Botany and Ecology					
Risk of further old growth fragmentation					
• in the corridor	Moderate	Low	Moderate	Low	Moderate
• beyond the corridor	Moderate	Low	Moderate	Moderate	Moderate
Level of protection of sensitive plant habitat.	Moderate	High	Low	Moderate	Moderate-high
Scenic Resources					
Visual evidence of management activities.	Mostly natural appearing, but widened highway in places may degrade scenery especially in the 5 mile section above the Collawash. Scenic quality in the viewshed outside of the corridor may be reduced in places, due to timber harvest, but will remain mostly natural.	Scenery will improve throughout the corridor as a result of restoration. Limiting further highway and rec development will provide a high level of scenic protection. Viewshed outside of corridor will improve due to longer rotations and old-growth protection.	Scenic quality will be slightly diminished but will still be mostly natural. Establishment of a scenic byway will improve viewing opportunities from the road.	Scenic quality will degrade somewhat due to effects from increased highway development and impacts to soil and vegetation in dispersed use areas. Scenic byway will improve viewing opportunities from road.	Scenic quality will be similar to alternative B above the Oak Grove Fork, alternative C and D below.

Indicator	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Timber Management					
"Regulated" timber volume outputs charged toward the Forest's Allowable Sale Quantity from the corridor.	650 MBF/year	0 MBF/year	0	0	0
Amount of "unregulated" timber harvested from corridor.	Little or none	Unestimated quantities. Minor outputs which are inconsistent from year to year.	Same as B	Same as B	Same as B
Reduction in timber volume outputs outside of corridor.	0	3,700 MBF/year	0	0	0

¹The Smolt Habitat and Legal Trout Indices have been standardized to 100 representing existing habitat capabilities. The outputs are measured for the first and fifth decades because it takes time for the fish populations to respond to changing habitat condition. In addition, the benefits gained by improved riparian management under the Forest Plan will take considerable time. One of the key assumptions for these indices is that fish production is relatively constant on a per mile basis.

Chapter 5

Consultation with Others

**Forest Service
Interdisciplinary
Team**

Dean Apostol, Landscape Architect
Katie Boula, Wildlife Biologist
Larry Bryant, Hydrologist
Bill Carr, Cultural Resources Specialist
Robert Deibel, Fisheries Biologist
Gale Masters, Botanist
Teresa Piehl, Engineering Specialist
Sharon Selvaggio, Wildlife Biologist
Kathleen Williams, Recreation Planner/Team Leader

The following people provided valuable technical assistance:

Karen Austin, Wildlife
Rowan Bibb, Cultural Resources
Val Chambers, Public Affairs, Socioeconomics
Tom DeRoo, Geology
John Haglund, Forest Ecology
Mike Redmond, Land Management Planning
Jim Rice, Silviculture
Jim Roden, Technical Editing
Glen Sachet, Recreation/Forest Plan
Susan Sater, Air Quality
Rich Wands, Fire Management
Ron Wanek, GIS

District Rangers

Janet Anderson-Tyler, Estacada Ranger District
John Berry, Clackamas Ranger District

GIS/mapping provided by Debbie Albright, desktop publishing by Shelly York, line drawings by Richard Zita.

**List of Agencies,
Organizations and
Individuals
Consulted**

Gary Miniszewski, Oregon State Parks and Recreation
John Lilly, Division of State Lands
David Bayles, Oregon Rivers Council
Tom Cassidy, American Rivers
Bob Freimark and Michelle Wilson, The Wilderness Society
Gary Hackett, Portland General Electric Company
Doug Cramer, Portland General Electric Company
Ron Darkes, Portland General Electric Company
John Sherman, Sierra Club
Scott Stuemke, Confederated Tribes of Warm Springs
Greg Burtchard, Portland State University
Jay Massey, Oregon Department of Fish and Wildlife
Al Ainsworth, Northwest Rafters Association
Bruce Hutchinson, Northwest Rafters Association
Sally and Dick Seymour, Oregon Equestrian Trail Club
Steve Scherrer, Oregon Kayak and Canoe Club
Thom Powell, Oregon Kayak and Canoe Club
John Garren, National Organization for River Sports
Jeff Kaiser, Oregon Dept. of Transportation
John Borge, Clackamas Co. Dept. Transportation and Development
Mike Fahey, Oregon Native Plant Society
Bill Fujii, Oregon State Water Resources Department
Jackie Diedrich, USDA-Forest Service
Jim Hulbert, USDA-Forest Service
Ralph Saperstein, NW Forestry Association
Chuck Harrison, Clackamas Water District
Mike DePaolo, White Water Boaters of Oregon
Richard Zettervall, White Water Boaters of Oregon
Russell Peterson, U.S. Fish and Wildlife Service
Fred Muhleman, Northwest Steelheaders
David Roth, Lower Columbia Canoe Club
Randy Gould, Bureau of Land Management
Bob Ratcliffe, Bureau of Land Management
Friends of the Clackamas

The following individuals provided verbal and written input, and/or attended public meetings. The entire mailing list for the Clackamas River is included in the Appendix.

Marty Wilson
Cole Gardiner
Ron Burnett
Avis Rana
Jeff Bohren
Chuck McGinnis
Cyril Oberlander
Larry Gooding
John Crabbe
Rhonda and George Ostertag
Dave and Char Corkran
Sally Hingley
Jerry Shelden
James Leatham
Carol and Bob Gould
Bob Patterson
Jim Bradbury
James Lamb
Clint Peterson
Cliff Gavic
Pat and Garry Buksa
Bruce Tolonen
Mike Wheeler
Rock Demaris
Lee Ogle
Gerry Lundeen
Jim Hurst
Karl Anuta
Bill Daniels
Bob Powne
Robert Peebles
John P. Miller
D.B. Charlton
Ken Bunker
Michael Campbell
Dennis Deck
C.R. King
David Bates
Keith Conaway
A. Greseking, Jr.
Sandy Peloquin
Pat Allen
Warren King

Summary of Public Involvement

Resource Assessment

- Consultation with specialists
- Newsletter
- Public meeting 10/90
- Written comments
- Field trip

Issues

- Newsletter
- Recreation Use Data Collection
- Consultation with specialists
- Mailing
- Written comments
- Public meetings 10/90, 11/91
- Presentations to groups
- Newspaper articles

Data Collection

- Newsletter
- Recreation Use Data Collection
- Consultation with specialists

Alternative Development

- Public meeting 11/91
- Mailing
- Written comments
- Presentations to groups

Analysis of Effects

- Consultation with specialists
- Written comments

Identification of Preferred Alternative

- Informal Consultations
- Written Comments

Final Environmental Assessment/Management Plan

- Legal Notice of Decision
- Comment Period

Appendices

Appendices Table of Contents

Appendix A - Comparison of Resource Assessment Findings with the Congressional Record	A-1
Appendix B - Results of Oregon Water Resources Department Streamflow Assessment (May, 1991)	B-1
Appendix C - Oregon Sensitive Wildlife Species List	C-1
Appendix D - Sensitive Plant Species - Clackamas and Estacada Ranger Districts (1991)	D-1
Appendix E - Proposed Clackamas ROS Classification Scheme	E-1
Appendix F - Clackamas River Management Plan	F-1
Summary of Alternative D	F-1
Forest Plan Changes	F-9
Implementation Schedule	F-16
Monitoring Schedule	F-21
Appendix G - References	G-1
Appendix H - Glossary	H-1

Appendix A

Comparison of Resource Assessment Findings with the Congressional Record

Geology

Neither the Resource Assessment nor the Congressional Record identified geology as an outstandingly remarkable value.

Hydrology

The Assessment found the hydrologic values of the Clackamas River to be important, but not outstandingly remarkable features. The Congressional Record also did not mention hydrologic values as outstandingly remarkable.

Water Quality and Quantity

No finding was reached in the Assessment regarding water quality. Water quantity was found to be an important, but not outstandingly remarkable value. The Congressional Record did not identify water quality and quantity as an outstandingly remarkable value for the Clackamas River.

Botany/Ecology

The Assessment found the river's botanic/ecologic values outstandingly remarkable.

The Congressional Record did not identify botany/ecology as an outstandingly remarkable value. It incorrectly states, "Another significant feature of the river is the confirmation of seven species of threatened or endangered plants." At one time seven plants, listed below, were thought to be sensitive. Currently, only *Corydalis aquae-gelidae* is listed as a sensitive species and is a candidate species proposed for Federal listing.

The original plant list included: *Cimicifuga laciniata*, *Corydalis aquae-gelidae*, *Erythronium oregonum*, *Isopyrum hallii*, *Iris tenuis*, *Carex interrupta*, and *Parnassia fimbriata* var. *hoodiana*.

Fisheries

The fisheries resources on the Clackamas River were determined to be an outstandingly remarkable value; this finding confirms the Congressional Record.

Wildlife

The Congressional Record did not identify wildlife as an outstandingly remarkable value. However, the Assessment found wildlife to be outstandingly remarkable.

Recreation

The findings in the Assessment are consistent with the Congressional Record. Both identified recreation resources as outstandingly remarkable values.

Cultural Resources

Both the pre-historic and historic cultural resources were found to be outstandingly remarkable values.

The Congressional Record did not identify cultural resources as an outstandingly remarkable value.

Scenic Resources

The Congressional Record identified scenery as an outstandingly remarkable value for the Clackamas River. Findings of the Assessment were that the Clackamas River clearly has several important scenic values; however, the presence of human alterations substantially detract from the scenic quality of the river. Thus, the scenic resource was found to be a significant value, but not outstandingly remarkable. The scenic resource should be considered a "potential" outstandingly remarkable value. The scenic resource can be rehabilitated, where past actions have reduced scenic quality.

Appendix B

Results of Oregon Water Resources Department (Upper) Clackamas Scenic Waterway (Water Rights) Assessment

Three Lynx Section

Three Lynx (RM 47.5) to the North Fork Reservoir

Flow Data for the Clackamas River Scenic Waterway
(gaged flows measured at Three Lynx, top of reach)

Mean Monthly Flow (cfs)

	Average Natural Flow ⁹	Average Flow ¹⁰	Flow for Fish ¹¹	Three Lynx-N.F. Reservoir Boating Flow Range ¹²	Recommended Scenic Waterway Flows
January	2953	2953	640	1022-11,467	2000
February	2981	2981	640	1022-11,467	2000
March	2329	2329	640	1022-11,467	2000
April	2674	2674	640	1022-11,467	2000
May	2740	2740	640	1022-11,467	2000
June	1709	1709	400	750+	750
July	943	943	400	750+	750
August	781	781	400	750+	750
September	791	791	400/640	750+	750
October	1026	1026	640	750+	750
November	2130	2130	640	1022-11,467	2000
December	2951	2951	640	1022-11,467	2000

⁹ Average Natural Flow is calculated by the WRD in the Water Availability Study.

¹⁰ The average flow is the 50 percent exceedance mean monthly flow value as estimated by the Water Resources Department.

¹¹ Flows for fish are based on an instream water right.

¹² Boating flow range identified in Willamette Kayak and Canoe Club (WKCC), 1988 and the "Clackamas River Whitewater Study" (Shelby et. al., 1988). Flow values are based on the gage at Three Lynx (RM 47.5). Identified season of use is year round.

Big Bottom Section

Olallie Lake (RM 82.5) to the Collawash River (RM 56.8)

Flow Data for the Clackamas River State Scenic Waterway
(gaged flows measured at Big Bottom RM 65.1)

Mean Monthly Flow (cfs)

	Average Natural Flow ¹	Average Flow ²	Flow for Fish ³	7 Miles Above Collawash- Riverside C.G. Boating Flow Range ⁴	Recom- mended Scenic Waterway Flows
January	632	632	240	360-1120	360
February	647	647	240	360-1120	360
March	510	510	240	360-1120	360
April	620	620	240	360-1120	360
May	687	687	240	360-1120	360
June	472	472	240	June 1-15 360-1120	360/240
July	293	293	150	-	150
August	264	264	150	-	150
September	261	261	150/240	-	150/240
October	292	292	240	-	240
November	473	473	240	360-1120	360
December	625	625	240	360-1120	360

¹ Average Natural Flow is calculated by the WRD in the Water Availability Study.

² The average flow is the 50 percent exceedance mean monthly flow value as estimated by the Water Resources Department.

³ Flows for fish are based on flows needed for fish and aquatic life and fish habitat above gage #2080 at Big Bottom (RM 65.1) as recommended by ODFW.

⁴ Boating flow range for this section was identified in WKCC, 1988, and based on readings at Three Lynx 9.3 miles below the run. Three Lynx flows were adjusted by WRD to reflect flows at Big Bottom gage (RM 65.1). Identified season of use is November through June 15.

Collawash Section

Collawash River (RM 56.8) to Three Lynx (RM-47.5)

Flow Data for the Clackamas River State Scenic Waterway

Mean Monthly Flow (cfs)

	Average Natural Flow ⁵	Average Flow ⁶	Flow for Fish ⁷	Collawash-Three Lynx Boating Flow Range ⁸	Recommended Scenic Waterway Flows
January	2953	2953	640	1000-3000	1000
February	2981	2981	640	1000-3000	1000
March	2329	2329	640	1000-3000	1000
April	2674	2674	640	1000-3000	1000
May	2740	2740	640	1000-3000	1000
June	1709	1709	640	June 1-15 1000-3000	1000/640
July	943	943	400	-	400
August	781	781	400	-	400
September	791	791	400/640	-	400/640
October	1026	1026	640	-	640
November	2130	2130	640	1000-3000	1000
December	2951	2951	640	1000-3000	1000

⁵ Average Natural Flow is calculated by the WRD in the Water Availability Study.

⁶ The average flow is the 50 percent exceedance mean monthly flow value as estimated by the Water Resources Department.

⁷ Flows for fish are based on an instream water right.

⁸ Boating flow range identified in WKCC, 1988. Flow values in the guidebook are based on the gage at Three Lynx (RM 47.5). Identified season of use is November through June 15.

Appendix C

Oregon Sensitive Wildlife Species List (1992)

Appendix C - List of Sensitive Species

English Name	Scientific Name	Province in which listed; stock or population (No notation indicates listing applies to all stocks, populations, or species throughout range of species in the state.)	Category ¹
Sensitive Fish Species (in alphabetical order)			
Alvord Chub	<i>Gila alvordensis</i>		Vulnerable
Bull Trout	<i>Salvelinus confluentus</i>		Critical
California (Pit) Roach	<i>Hesperoleucus symmetricus mitrulus</i>		Per./Nat. Rare
Catlow Tui Chub	<i>Gila bicolor ssp.</i>		Vulnerable
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	Lower Columbia River Fall Run Stocks	Critical
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	Snake River Fall Run Stocks	Critical
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	Snake River Spring Run Stocks	Critical
Chinook Salmon	<i>Oncorhynchus tshawytscha</i>	South Coast Fall Run Stocks	Critical
Chum Salmon	<i>Oncorhynchus keta</i>		Critical
Coastal Cutthroat Trout	<i>Oncorhynchus clarki clarki</i>	Anadromous Columbia River Basin Stock	Critical
Coho Salmon	<i>Oncorhynchus kisutch</i>	Lower Columbia River Stocks	Critical
Coho Salmon	<i>Oncorhynchus kisutch</i>	South Coast Stocks	Critical
Goose Lake Lamprey	<i>Lampetra tridentata ssp.</i>		Critical
Goose Lake Sucker	<i>Catostomus occidentalis lacus-anserinus</i>		Critical
Lahontan Redside (Shiner)	<i>Richardsonius egregius</i>		Per./Nat. Rare
Malheur Mottled Sculpin	<i>Cottus bairdi ssp.</i>		Critical
Margined Sculpin	<i>Cottus marginatus</i>		Vulnerable
Millicoma Dace	<i>Rhinichthys cataractae ssp.</i>		Undet. Status
Oregon Chub	<i>Oregonichthys crameri</i>	Willamette River System	Critical
Oregon Lakes Tui Chub	<i>Gila bicolor oregonensis</i>		Vulnerable
Pit Sculpin	<i>Cottus pitensis</i>		Per./Nat. Rare
Redband/Inland Rainbow Trout	<i>Oncorhynchus mykiss ssp.</i>		Vulnerable
Sheldon Tui Chub	<i>Gila bicolor eurysona</i>		Critical

Summer Basin Tui Chub (<i>Gila bicolor ssp.</i>)	Critical
Tahoe Sucker (<i>Catostomus tahoensis</i>)	Per./Nat. Rare
Westslope Cutthroat Trout (<i>Oncorhynchus clarki lewisi</i>)	Vulnerable

Sensitive Herptile Species (in alphabetical order)

Black Salamander (<i>Aneides flavipunctatus</i>)	Per./Nat. Rare
California Mountain Kingsnake (<i>Lampropeltis zonata</i>)	Per./Nat. Rare
California Slender Salamander (<i>Batrachoseps attenuatus</i>)	Per./Nat. Rare
Cascade Frog (<i>Rana cascadae</i>)	Critical
Clouded Salamander (<i>Aneides ferreus</i>)	Critical
Common Kingsnake (<i>Lampropeltis getulus</i>)	Per./Nat. Rare
Cope's Giant Salamander (<i>Dicamptodon copei</i>)	Critical
Del Norte Salamander (<i>Plethodon elongatus</i>)	Vulnerable
Desert Horned Lizard (<i>Phrynosoma platyrhinos</i>)	Vulnerable
Foothill Yellow-legged Frog (<i>Rana boylei</i>)	Undet. Status
Larch Mountain Salamander (<i>Plethodon larselli</i>)	Vulnerable
Mojave Black-collared Lizard (<i>Crotaphytus bicinctores</i>)	Vulnerable
Northern Leopard Frog (<i>Rana pipiens</i>)	Vulnerable
Olympic Salamander (<i>Rhyacotriton olympicus</i>)	Vulnerable
Oregon Slender Salamander (<i>Batrachoseps wrighti</i>)	Critical
Painted Turtle (<i>Chrysemys picta</i>)	Critical
Red-legged Frog (<i>Rana aurora</i>)	Undet. Status
Sharptail Snake (<i>Contia tenuis</i>)	Critical
Siskiyou Mountains Salamander (<i>Plethodon stormi</i>)	Vulnerable
Spotted Frog (<i>Rana pretiosa</i>)	Critical
Tailed Frog (<i>Ascaphus truei</i>)	Vulnerable
Western Ground Snake (<i>Sonora semiannulata</i>)	Per./Nat. Rare
Western Pond Turtle (<i>Clemmys marmorata</i>)	Critical

Sensitive Bird Species (in alphabetical order)

Acorn Woodpecker (<i>Melanerpes formicivorus</i>)	Undet. Status
American White Pelican (<i>Pelecanus erythrorhynchos</i>) Breeding Population	Vulnerable
Bank Swallow (<i>Riparia riparia</i>)	Undet. Status
Barrow's Goldeneye (<i>Bucephala islandica</i>) Breeding Population	Per./Nat. Rare
Black-backed Woodpecker (<i>Picoides arcticus</i>)	Critical

Black Rosy Finch (<i>Leucosticte arctoa atrata</i>) Basin and Range (Steens Mountain)	Per./Nat. Rare
Black Swift (<i>Cypseloides niger</i>) Assumed Breeding Population	Per./Nat. Rare
Bobolink (<i>Dolichonyx oryzivorus</i>)	Vulnerable
Bufflehead (<i>Bucephala albeola</i>) Breeding Population	Per./Nat. Rare
Burrowing Owl (<i>Speotyto cunicularia</i>) Western Interior Valleys, Columbia Basin, and Blue Mountains . . .	Critical
Dusky Canada Goose (<i>Branta canadensis occidentalis</i>)	Vulnerable
Ferruginous Hawk (<i>Buteo regalis</i>)	Critical
Flammulated Owl (<i>Otus flammeolus</i>)	Critical
Fork-tailed Storm-Petrel (<i>Oceanodroma furcata</i>) Breeding Population	Vulnerable
Franklin's Gull (<i>Larus pipixcan</i>)	Per./Nat. Rare
Grasshopper Sparrow (<i>Ammodramus savannarum</i>)	Undet. Status
Great Gray Owl (<i>Strix nebulosa</i>)	Vulnerable
Greater Sandhill Crane (<i>Grus canadensis tabida</i>)	Vulnerable
Harlequin Duck (<i>Histrionicus histrionicus</i>) Breeding Population	Per./Nat. Rare
Horned Grebe (<i>Podiceps auritus</i>) Breeding Population	Per./Nat. Rare
Least Bittern (<i>Ixobrychus exilis</i>)	Per./Nat. Rare
Lewis' Woodpecker (<i>Melanerpes lewis</i>), Western Interior Valleys, West and East Slopes of Cascades, and Columbia Basin	Critical
Marbled Murrelet (<i>Brachyramphus marmoratus</i>)	Critical
Northern Goshawk (<i>Accipiter gentilis</i>)	Critical
Northern Pygmy-Owl (<i>Glaucidium gnoma</i>)	Undet. Status
Pileated Woodpecker (<i>Dryocopus pileatus</i>)	Critical
Purple Martin (<i>Progne subis</i>)	Critical
Pygmy Nuthatch (<i>Sitta pygmaea</i>)	Vulnerable
Red-necked Grebe (<i>Podiceps grisegena</i>) Breeding Population	Critical
Sage Grouse (<i>Centrocercus urophasianus</i>) East Slopes of Cascades, Columbia Basin, and Blue Mountains . . .	Vulnerable
Snowy Egret (<i>Egretta thula</i>) Breeding Population	Vulnerable
Spruce Grouse (<i>Dendragapus canadensis</i>)	Undet. Status
Streaked Horned Lark (<i>Eremophila alpestris strigata</i>) Western Interior Valleys	Undet. Status
Swainson's Hawk (<i>Buteo swainsoni</i>)	Vulnerable

Three-toed Woodpecker (<i>Picoides tridactylus</i>)	Critical
Tricolored Blackbird (<i>Agelaius tricolor</i>)	Per./Nat. Rare
Upland Sandpiper (<i>Bartramia longicauda</i>)	Critical
Western Bluebird (<i>Sialia mexicana</i>) Coast Range, Western Interior Valleys, and West Slopes of Cascades	Vulnerable
White-faced Ibis (<i>Plegadis chihi</i>)	Vulnerable
White-headed Woodpecker (<i>Picoides albolarvatus</i>)	Critical
Williamson's Sapsucker (<i>Sphyrapicus thyroideus</i>)	Undet. Status
Yellow-billed Cuckoo (<i>Coccyzus americanus</i>)	Critical
Yellow Rail (<i>Coturnicops noveboracensis</i>)	Critical

Sensitive Mammal Species (in alphabetical order)

American Marten (<i>Martes americana</i>)	Critical
Fisher (<i>Martes pennanti</i>)	Critical
Fringed Myotis (<i>Myotis thysanodes</i>)	Vulnerable
Northern (Steller) Sea Lion (<i>Eumetopias jubatus</i>)	Critical
Pallid Bat (<i>Antrozous pallidus</i>)	Vulnerable
Pygmy Rabbit (<i>Brachylagus idahoensis</i>)	Vulnerable
Ringtail (<i>Bassariscus astutus</i>)	Undet. Status
Townsend's Big-eared Bat (<i>Plecotus townsendii</i>)	Critical
Washington Ground Squirrel (<i>Spermophilus washingtoni</i>)	Critical
White-fronted Vole (<i>Phenacomys albipes</i>)	Per./Nat. Rare
White-tailed Antelope Squirrel (<i>Ammespermophilus leucurus</i>)	Undet. Status
White-tailed Jackrabbit (<i>Lepus townsendii</i>)	Vulnerable

¹ Definitions:

Critical: Species for which listing as threatened or endangered is pending, or those for which listing may be appropriate if immediate conservation actions are not taken.

Vulnerable: Species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring.

Peripheral or Naturally Rare: Species whose Oregon populations are on the edge of their range, and species which had low population numbers historically because of naturally limiting factors. Maintaining the status quo for the habitats and populations of these species is needed at a minimum.

Undetermined Status: Species for which status is unclear. These may be susceptible to population decline of sufficient magnitude and could qualify for endangered, threatened, critical, or vulnerable status. Scientific study is needed before a judgement can be made.

Source: Oregon Department of Fish and Wildlife
Sensitive Vertebrates of Oregon, 1992

Appendix D

Sensitive Plant Species - Clackamas/Estacada Ranger Districts (1992)

Documented Occurrence

2 ?	AGOELA	<i>Agoseris elata</i> (Nutt.) Greene	tall agoseris
X 1	ASTGOR	<i>Aster gormanii</i> (Piper) Blake	Gorman's aster
2	BOTMON	<i>Botrychium montanum</i> W.H. Wagner	mountain grape-fern
X 1	CORAQU	<i>Corydalis aquae-gelidae</i> Peck & Wilson	cold-water corydalis
2	LYCCOM	<i>Lycopodium complanatum</i> L.	fir club-moss
2	LYCSEL	<i>Lycopodium selgo</i> L.	fir club-moss
2	OPHVUL	<i>Ophioglossum vulgatum</i> L.	adder's tongue
X 1	POALAX	<i>Poa laxiflora</i> Buckl.	loose-flrd. bluegrass
X 1	SISSAR	<i>Sisyrinchium sarmentosum</i> D. Henderson	pale blue-eyed grass
2	UTRMIN	<i>Utricularia minor</i> L.	lesser bladderwort
2	WOLCOL	<i>Wolffia columbiana</i> Griseb.	water-meal

Suspected Occurrence

2	AGOELA	<i>Agoseris elata</i> (Nutt.) Greene	tall agoseris
2	BOTLAN	<i>Botrychium lanceolatum</i> (Gmel.) Angstrom	lance-leaved grape-fern
2	BOTMIN	<i>Botrychium minganense</i> Vict. (<i>B. lunaria</i>)	moonwort
2	BOTMON	<i>Botrychium montanum</i> W.H. Wagner	mountain grape-fern
2	BOTPIN	<i>Botrychium pinnatum</i> St. John (<i>B. boreale</i>)	pinnate grape-fern
2	CARLIV	<i>Carex livida</i> (Wahl.) Willd.	pale sedge
1	CIMELA	<i>Cimicifuga elata</i> Nutt.	tall bugbane
2	COPTRI	<i>Coptis trifolia</i> (L.) Salisb.	threeleaflet goldthread
2	LYCINU	<i>Lycopodium inundatum</i> L.	bog club-moss
2	LYCCOM	<i>Lycopodium complanatum</i> L.	fir club-moss
2	LYCINU	<i>Lycopodium inundatum</i> L.	bog club-moss
2	OPHVUL	<i>Ophioglossum vulgatum</i> L.	adder's tongue
2	SCHPALA	<i>Scheuchzeria palustris</i> var. <i>americana</i> Fern	scheuchzeria
2	STRSTR	<i>Streptopus streptopoides</i> (Ledeb.) Frye & Rigg	kruhsea
2	UTRMIN	<i>Utricularia minor</i> L.	lesser bladderwort
2	WOLCOL	<i>Wolffia columbiana</i> Griseb.	water-meal

Oregon Status:

1 = Endangered or Threatened throughout range.

2 = Endangered or Threatened in Oregon but more common or stable elsewhere.

? = Documented occurrence - I.D. needs to be verified.

X = Federal Candidate Species (all are C2 = Category 2 candidates. Additional information is needed in order to propose as Endangered or Threatened.)

Note: The Mt. Hood Sensitive Plant Species list is derived from USFWS & ODA lists with input from agency botanists and is approved by the Forest Supervisor annually.

Appendix E

Proposed Clackamas ROS Classification Scheme

Access And Design Considerations

Urban River Zone

Full access is typical; cross-country travel, non-motorized trails and waterways, motorized trails, and D, C, and B service level roads are fully compatible with this setting. Facilities are mostly designed for user comfort and convenience. Synthetic materials are commonly used. Facility design may be highly complex and refined, but in harmony or complementary to the site. Design for Level 4 accessibility. Maximum number of campground units per facility is unlimited. Unit spacing is to maximize capacity, and there is no maximum vehicle size. Interpretive materials, areas, and programs are highly developed, and may include visitor centers, large amphitheaters, book stores, etc.

Rural River Zone

Access level, barrier-free level, and maximum number of camp units are similar to Urban Zone. Some facilities are designed primarily for user comfort and convenience. Some synthetic but harmonious materials may be incorporated. Design may be more complex and refined than in Roaded Natural Zones. Campground unit spacing to maximize capacity, yet provide unit shading. Critical vehicle length is 40 feet(?) Interpretation includes some complex structures: small visitor centers, overlooks, and amphitheaters.

Roaded Natural River Zone

Full access, or level B and C roads: typically controlled. Some roads may be partially or fully closed. Development consists of rustic facilities providing some comfort for the user as well as site protection. Native materials are used but with more refinement in design than in Semi-Primitive zones. Synthetic materials should not be evident. Target accessibility level = 3. Maximum number of campground units = 80. Unit spacing should be at least 50 feet between living areas. Critical vehicle length = 30 feet (school bus). Interpretation includes guided walks and talks, roving programs, brochures, interpretive trails, overlooks, small amphitheaters, boardwalks.

Semi-Primitive Motorized

Access is by motorized trails and primitive roads (TSL D). Facilities are rustic and rudimentary, and built primarily for site protection. There is no evidence of synthetic materials; undimensioned native materials are used. Accessibility Level = 2. Maximum number of campground units per facility = 30. Minimum unit spacing = 70 feet between living areas. Critical vehicle length = 20 feet. Interpretation is through self-discovery, augmented by agency and other publications. No agency-provided interpretive facilities, except numbered posts, or simple viewpoints.

Semi-Primitive Non-Motorized

Access is via non-motorized trails and waterways. Development is similar to Semi-Primitive Motorized zones. Interpretation is through self-discovery, augmented by books, guides and maps. No agency-provided contact, materials, or facilities.

Primitive River Zone

Not applicable to the Clackamas.

On-River Use Management

Urban River Zone

Remoteness of river trips is of little relevance to enjoyment of trip. Large numbers of users are encountered on-site and in nearby areas. Regimentation and controls are obvious and numerous. Information exhibits are sophisticated and complex. Visitor impacts are a major concern. Site hardening may dominate, but harmonizes with surrounding environment.

Rural River Zone

Remoteness of river trips is of little relevance to enjoyment of trip. There are frequent contacts with other river users. Regimentation and controls are obvious and numerous, but harmonize. Information facilities are somewhat complex. Allowed impact levels are similar to Urban River zones.

Roaded Natural River Zone

Again, remoteness is of little relevance. Moderate to high contact with other users at rapids and access points can be expected. On-site regimentation and controls are noticeable, but harmonize with the natural environment. Information facilities are relatively simple. Human use is apparent. Sites are modified, and subtle site hardening is provided to minimize impacts and to provide for user convenience.

Semi-Primitive Motorized River Zone

River users experience only distant sight and/or sound of human activity. Opportunity to leave the river occurs at limited access points. Only 3 - 4 parties are met per day, with two or less encountered at put-in/take-out areas. Visitor use is managed through subtle on-site regimentation and controls. Information facilities are very limited. User impacts do not limit ecosystem function, and are obvious, but subordinate. Sites may be hardened to accommodate motorized use. Toilets may be provided.

Semi-Primitive Non-Motorized River Zone

River users experience only distant sight and/or sound of human activity. There is a sense of commitment to a river trip, and perception of a difficult return. Expected encounters are at levels similar to SPM zones. Visitor use is managed through subtle on-site regimentation and controls. Information facilities are very limited. User impacts do not limit ecosystem function, and are not apparent in an area greater than 1,000 square feet. No site hardening. Primitive toilets may be provided.

Appendix F

Clackamas River Management Plan

Summary of Alternative D

Corridor Boundary

Adopt new Federal Wild and Scenic River boundary. See Map 3.1 Total acres: 15,600. State scenic waterway boundary remains unchanged and is similar to Map 2.1 except that it ends at the Olallie Scenic Area boundary (power line).

River Classification and Implementation

Federal Scenic and Recreational classification will remain unchanged.

State Scenic Waterway classification would be changed to match the federal classification. Previously the entire length was Recreational River Areas under the State system.

Hydrology

Water-Related Projects

Operation of existing water-related projects (e.g., hydroelectric, municipal, water supply, etc.) is accepted/allowed under terms of current license or permit. All water-related project proposals would be subject to a project-specific analysis of potential effects on river values. The project proponent would be responsible for conducting studies/analyses acceptable to Forest Service and other agencies. Forest Service to communicate concerns, requirements, prohibition, etc. to other licensing or permitting agencies (FERC, Oregon Water Resources Department, DSL, etc.). Opportunities to improve flow conditions and operating conditions of the existing hydroelectric projects would be explored during relicensing.

Expansion/modification of existing water-related projects allowed if outstandingly remarkable values are maintained or enhanced.

Construction/operation of new water-related projects is prohibited within the corridor, and discouraged in tributaries. May be allowed if it is determined that river values remain in optimal condition.

Water Quantity

Recommend continued USGS and PGE flow monitoring at existing gauging stations on mainstem and tributary streams. Recommend State of Oregon to establish minimum instream water rights for recreational value through state (WRD) process. Recommend ODFW to apply for additional instream water rights for fish. Forest Service would quantify instream flow needs to protect flow dependent resources.

Water Quality

Develop a cooperative (EPA, USFS, USGS, DEQ, local communities, friends groups) monitoring program for water quality. Program will include water quality parameters and thresholds reflecting potentially affected beneficial uses (fish, recreation, etc.), and an action plan outlining notification procedures and mitigation measures if water quality standards are not met. Forest Service will develop instream flow needs pursuant to February 12, 1992 Region 6 Water Quantity/Quality Process Paper.

Fisheries

Continue inventories and surveys of fish and aquatic organisms on an as-needed basis. Correct fish passage problems at culverts on Fawn, Lowe, Mag, Rhododendron, Ruby, Tag, Tar and Wolf Creeks. Naturally occurring debris would not be removed from river unless hazardous to public. Develop cooperative agreement with ODFW to complement subbasin plan.

Coordination with entities interested in restoring runs of native fish stocks such as the National Marine Fisheries Service, U.S. Fish and Wildlife Service, Portland General Electric and Oregon Trout and develop cooperative working agreements and MOU's to implement items to restore native fish stocks.

Fish Habitat Structures

Anadromous Fish Miles Treated - 11 mi. total. RM 56-65, RM 72.8-74.8; create "holding" areas near campgrounds.

Structure Types - Boulder and log complexes.

Density (no. per 1,000 feet of river) - 10-15

Maximum Allowable Span Across Channel - 50 percent

Side Channels would be created.

Fish stocking practices would continue current levels and locations of stocking of rainbow trout and summer steelhead.

Coordination With ODFW

Develop a memorandum of understanding with ODF&W to implement action items in subbasin plan to restore native fish stocks. Specific action items determined on a case by case basis and based on analysis of problems affecting native fish stocks. Action items could include:

- marking all hatchery released spring chinook salmon;
- genetic studies to determine if two stocks of coho salmon exist in the Clackamas river;
- studies to determine if competition between the early and late-run coho stocks and between summer and winter steelhead juveniles is inhibiting restoration of native stocks;
- studies to determine factors limiting production of anadromous fish;
- studies to determine if hatchery origin winter steelhead are interbreeding with native winter steelhead;
- studies to refine existing and future habitat capability and biological production potential for native fish stocks in the Clackamas basin; and
- other action items outlined in subbasin plan or determined necessary through coordination and additional information.

Wildlife

Survey for bald eagle habitat occupancy. Review suitable habitat for potential peregrine falcon nesting sites. Complete 10-year elk transplant program. Meet Regional direction for spotted owl management. Protect all known osprey nest sites. Complete all habitat and species inventories required by Forest Plan.

Deer and Elk Forage Opportunities

Maintain frost pockets and meadows as forage openings. Obliterate and seed/plant selected closed roads with forage plants, and aggressively manage harvested areas to promote forage growth.

Wildlife Habitat Protection

Protect beaver dams/dens where compatible with recreation use.

Utilize beaver transplants to expand wetland habitat in selected sites.

Except for road expansions, avoid development, harvest, or ground disturbance in areas supporting breeding sensitive amphibian populations.

In harvest areas, provide densities of snags and logs that approximate unharvested old-growth natural levels.

Watchable Wildlife Opportunities

Implement bird-banding and monitoring station.

Develop watchable wildlife sites.

Botany And Ecology

Maintain and enhance known populations of sensitive, threatened, and endangered plants and their associated habitats. Develop interpretive natural history program to include access and other information on unique plant communities along the Clackamas River. Restore native vegetation along roadsides, in riprap, and in riparian areas, where feasible.

Rehabilitation of user-impacted riparian zones.

Within 100' of river, modify, rehab, or remove informal recreation use areas not consistent with riparian values, plus closures to achieve desired ROS class, and other plan objectives.

Cultural Resources

Cultural resources will be protected. Use "Passports in Time" (national program involving volunteer help for cultural resource projects) for archaeological excavations. Incorporate Clackamas corridor cultural resource information into regional publications. Consistent with ROS classes. Enhance access and interpretation of cultural resource sites, where such sites can be adequately protected. Stabilize and rehabilitate sites currently being degraded.

Encourage nomination of cultural resources to the National Register, including Three Lynx townsite (as Historic District).

Recreation and Public Use

Recreation Opportunity Spectrum (ROS) Classification

- Big Cliff to Whale Creek - Roaded Natural (RN).
- Whale Creek to Tar Creek - Semi-primitive Motorized (SPM); Roaded Natural beyond 1/4 mile from river
- Tar Creek to 4650 Bridge (June Cr.) - Roaded Natural.
- 4650 Bridge to 4690 Jct. - Semi-primitive Nonmotorized (SPNM) beyond 300 ft. from Forest roads, Semi-primitive Motorized within 300 ft.
- 4690 Jct. to 4690 Bridge - Semi-primitive Motorized.
- 4690 Bridge to Big Spring - Semi-primitive Motorized.

Recreation Facilities (Existing)

All sites not currently at standard Forest Service maintenance levels would be rehabilitated to that standard by the year 2000. Rehabilitate to achieve design capacity, and to meet revised ROS class and other area objectives.

10% of overnight units converted to day use; capacity replaced in new upriver campground.

Recreation Facilities (New)

Facility development in the corridor would be planned to be consistent with the revised ROS classification scheme. Common use and/or staging areas of trail heads and campgrounds may achieve the next lowest (less primitive) class. Currently disturbed/modified areas should be considered first for development. All developments should be located out of the riparian zone; trails excepted where riparian values can be adequately protected. Priorities for development and de-investment are based on node concept.

Trails

Construct/reconstruct trails to enhance trail "system", where consistent with plan objectives. All trails will be multi-user, where feasible, except for dedicated interpretive trails. All multi-user trails will have alternate routes identified in planning process, to be developed if future use levels or conflicts require separation. *Incorporate overnight camping opportunities into urban link trail planning.* Provide accessibility levels consistent with ROS Class Specifications, with effort to enhance access for short distances from trail heads and campgrounds.

Day Use Areas

Provide for multi-function day use areas wherever possible. Functions to be considered include: fishing access; picnicking; trailhead; orientations, viewing and interpretation. Provide only those combinations and scale of functions for which parking can be provided.

Limited drive-through interpretive opportunities would be provided.

Strategies for Accommodating Increased Demand

Increase capacity where necessary to accommodate projected growth of those activities with greater than 40% preferring primitive/semi-primitive settings. Including: Freshwater bank fishing, non-motorized river boating, Nature/Wildlife observation, off-road bicycle riding and hunting.

River Access

Construct restrooms (or access to nearby facilities) and information/self-registration station, and stabilize banks at both put-in (Sandstone) and take-out (Memaloose). Cooperate with BLM for all enhancements on BLM land (i.e., Memaloose take-out ramp area).

Access Points: No launch facilities for drift boats would be developed.

Bob's Hole: Provide at-grade parking in a manner consistent with other plan objectives.

Informal Use Areas

Manage according to ROS class. Existing use areas classified under SPNM would be converted to walk-in sites, with parking in motorized zones. For all areas, maintain or reduce capacity.

Information and Natural Resource Interpretation

Cooperate with ODOT to develop a river corridor orientation station and photo point at the Highway 224 viewpoint above North Fork Reservoir. Develop quarterly visitor's guide, make available at Ranger Stations, local businesses and Olallie Guard Station. Develop a series of brochures that, focus on a different resource/opportunity in the corridor. Incorporate interpretive improvements into all developed sites, as afforded by on-site opportunities, consistent with ROS guidance. Continue and expand provision of interpretive programs.

Public Use Management and Law Enforcement

Implement closures necessary to achieve revised ROS class. Prohibit mountain bicycle use on Riverside National Recreation Trail.

Law Enforcement

Coordinate with Clackamas County to increase patrols in corridor. Provide level II (basic) law enforcement training for all summer field personnel in frequent contact with visitors: emphasis to be on public information and education, and employee safety.

Whitewater Use

Continue efforts to more accurately determine use levels, group size, and timing of use, as well as the social, physical, and environmental factors contributing to the whitewater boating opportunities. Outfitter/guide operating plans to include safety and ethics demonstrations for customers. Develop a USFS and BLM commercial permitting coordination agreement outlining authorities, administration, and fee collection associated with commercial recreation use on the Clackamas River.

Method to Determine Use and Set Use Limits

Use levels determined through a two year monitoring period. Mandatory self-registration in long term. Provide social experiences based upon ROS classification for various river segments. Special events exempted unless safety hazard results.

Administration

During study period, issue 3 commercial rafting permits to current permittees. Unregulated private use. Approximate commercial use not to exceed 20 % of total estimated use levels since designation until validated through study. No additional permit system established unless other strategies to manage use fail. If permit system is invoked, efforts will be made to ensure fair and equitable access to both private and guided users.

Management of Private Lands (Austin Hotsprings Parcel)

Land Use Controls

As allowed under County zoning revisions to conform to Clackamas National Wild and Scenic River and State Scenic Waterway management objectives.

Land uses consistent with Clackamas National Wild and Scenic River and State Scenic Waterway goals.

Remove waste and rehabilitate site. Development only to the level necessary for public safety and resource protection. Day use only. May require full-time on-site presence.

Austin parcel is identified for acquisition.

Scenic Resources

Visual Quality Objectives (No change from Forest Plan)

Scenic segments, as viewed from river, roads and trails would be Retention in the Foreground and Partial Retention in the rest of the seen area.

Recreational segments, as viewed from river and trails, would be Partial Retention in the entire seen area. Note: The foreground viewed from roads 224 and 46 would be retention as in Forest Plan.

Access and Travel Management

Planned Roadway Expansions

Reconstruct to safely accommodate existing uses, only to 63 Jct., consistent with other Plan objectives. Minimize landform and resource disturbance. The State is considering relocating Highway 224 from Foreman Hill to the Ripplebrook Bridge.

Target Uses

Large Recreational Vehicles: Accept.

Oversized Commercial Vehicles: Accept.

Bicycles: Encourage up 46 Road to 63 Road (4-foot shoulder is adequate), accept above 63 Road.

The driving experience would be designed for slower speeds for a more meandering trip. The speed and design accentuate driving through a natural setting. Design speed 35 mph between Three Lynx and Ripplebrook.

Parking would be designed to accommodate site capacity.

Motor Vehicle Access Controls

Close roads where necessary to meet Forest Plan open road density standards and ROS class. Area closures are likely in Big Bottom and the Mag and Tag Creek watersheds.

Maintenance

Coordinate with ODOT to minimize soil erosion and water quality degradation; no non-permitted depositing of materials ("sidecasting" onto banks and/or into river).

Material Storage

Existing waste areas to be screened to meet VQOs, or relocated if suitable sites are available. New waste areas in corridor would be allowed if they meet VQO requirements. Also consider incorporating waste material into potential recreation and highway construction/reconstruction projects.

Bank Stabilization

Non-structural bank stabilization methods are preferred over structural methods. Short-term structures, used to attain long-term natural stability, are allowed. Where combined structural/non-structural methods are used, whether short-or long-term in nature, structures will be screened by natural or natural-appearing materials. Natural appearing cuts in rock areas is the preferred method for slope stabilization in other areas. Develop a memorandum of understanding with ODOT to specify standards and guides for maintenance activities in the river corridor.

Special Roadway Considerations

If Highway 224 and road 46 become a Scenic Byway, the Forest Service would encourage a low development emphasis.

Timber Management

Timber Harvest in Corridor

Forest Service - No "regulated" harvest would occur; however, timber harvest may occur on an "unregulated" basis if it is designed to protect or enhance river values and ensure visitor safety.

Bureau of Land Management - (less than 200 acres, near Big Cliff) Approximately two-thirds of the BLM-administered lands would be managed primarily for the protection of soils and riparian values, with no planned timber harvest. The remainder would be available for management (150-year rotation), with emphasis on retention of scenic value.

Harvest Methods

Uneven-aged management would be considered in highly visible portions. Even-aged management would be considered if visual quality objectives could be met.

Management for Old-Growth Characteristics

Silvicultural prescriptions would seek to maintain a continuous forest cover with old-growth characteristics.

Hazard Trees

Standing trees determined to be a public hazard should be topped, rather than felled, unless safety objectives cannot be otherwise achieved.

Management Area Direction

A1-CLA Clackamas Scenic, and Recreational River

Goal

Protect and enhance the resource values for which the river was designated into the Wild and Scenic Rivers System. The specific goals for Scenic and Recreational classified river segments are:

Scenic - Maintain or enhance quality scenery and protect the essentially undeveloped character of the shoreline.

Recreational - Provide opportunities for recreational activities and maintain visual quality.

Location

This management area applies to the final Clackamas River corridor as established by the Clackamas National Wild and Scenic River and State Scenic Waterway Environmental Assessment and Management Plan. This river was designated by Public Law 90-542 in accordance with the Wild and Scenic Rivers Act of 1968.

Other Management Areas overlap the Clackamas River Corridor including A4, A7, A9, A13, B5, B7, and B8. If inconsistencies occur between these prescriptions, the Standards and Guidelines most restrictive to vegetation and access management predominates.

Desired Future Condition - Clackamas River

The outstandingly remarkable values associated with this river are protected and perpetuated for present and future generations. These values include:

- Botany/Ecology, Fish, Wildlife, Recreation, and Cultural Resources.
- A multi-layered old-growth forest providing connectivity with other mature habitats.
- A diversity of aquatic habitat types that foster high production of native salmonids. Some sections of the river have complex log and boulder structures and side channels.
- Riparian habitats, which were altered by past road construction, are rehabilitated and aquatic and riparian functions restored.
- Available aquatic habitats are fully occupied by native fish stocks.
- Outstanding views of river canyons and mountains.
- A wide variety of high quality recreational experiences will continue to attract a growing number of users.
- Recreational uses and facilities are oriented toward minimum riparian impact.

A1-CLA Clackamas Scenic and Recreational River

Standards and Guidelines

A. General

1. All management activities in the river corridors shall protect and/or enhance the identified outstandingly remarkable values. (FSH 1909.12, Chapter 8, 7/87). A1-CLA-01
2. The free-flowing characteristics of the river shall be protected (PL 90-542, Wild and Scenic Rivers Act, 1989.) A1-CLA-02
3. River characteristics necessary to support the existing classification of Scenic, or Recreational shall be protected during all management activities (Federal Register, Vol. 47, No. 173 9/82, Interagency Guidelines). A1-CLA-03
4. Management activities shall be consistent with prescribed Recreation Opportunity Spectrum (ROS) classes (FSM 2311.1). A1-CLA-04
 - a. Big Cliff to Whale Creek - Roded Natural.
 - b. Whale Creek to Tar Creek - Semi-primitive Motorized; Roded Natural beyond 1/4 mile from river.
 - c. Tar Creek to 4650 Bridge (June Cr.) - Roded Natural.
 - d. 4650 Bridge to Junction of road 46 and 4690 - Semi-primitive Nonmotorized beyond 300 ft. from open Forest roads, Semi-primitive Motorized within 300 ft.
 - e. 4690 Jct. to Big Spring - Semi-primitive Motorized.

B. Specific Resource Values

1. Dispersed Recreation Facility and Site Construction, Administration and Management
 - a. Dispersed recreation improvements (e.g. trails) shall be provided to: A1-CLA-05
 - (1) Minimize site degradation in scenic segments.
 - (2) Provide for comfort and convenience of users in recreational segments.
 - (3) Provide a minimum of convenience in scenic segments.
 - b. Dispersed recreation sites within 100 feet of the Clackamas River should be consistent with riparian values and should be consistent with the designated Recreation Opportunity Spectrum class. A1-CLA-06
A1-CLA-07
 - c. Recreational livestock use should be allowed in all segments, provided river banks, riparian vegetation, and scenic quality are protected from adverse impacts. A1-CLA-08

- d. Recreational livestock may be tied, grazed or held overnight or for extended periods of time within the near-foreground areas (i.e. 100 feet) of campsites, trails, and key interest areas. A1-CLA-09
- (1) Utilization of current year's vegetation growth should not exceed 30 percent (see Forestwide Range Management Standards and Guidelines). A1-CLA-10
- (2) No more than 5 percent of an activity area should be in a detrimental soil condition from the combined impact of compaction, puddling and displacement (see Forestwide Soil Productivity Standards and Guidelines). A1-CLA-11
- (3) Exposed mineral soil around campsites, trails and key interest areas should not exceed 25 percent of the activity area. A1-CLA-12
- 2. Developed Recreation Facility and Site Construction, Administration and Management
- a. Developed recreation improvements shall be provided to: A1-CLA-13
 - (1) Minimize site degradation in scenic segments.
 - (2) Provide for comfort and convenience of users in recreational segments.
 - (3) Provide a minimum of convenience in scenic segments.
- b. Existing developed recreation sites may be converted to dispersed sites. New developed sites may be allowed in both scenic and recreational segments. A1-CLA-14
A1-CLA-15
- c. Developed sites of more than 20 units should be discouraged in Scenic river corridors. A1-CLA-16
- d. All sites not currently at standard Forest Service maintenance levels should be rehabilitated to that standard by the year 2000. A1-CLA-17
- 3. Visual Resource Management

See Forest Wide Visual Resource Management Standards and Guidelines.
- 4. Cultural Resources Management

See Forestwide Cultural Resources Standards and Guidelines.
- 5. Wildlife and Fisheries
 - a. Habitat improvement practices should be limited to those which are necessary for the protection, conservation, rehabilitation, or enhancement of river area resources. A1-CLA-18

- | | | |
|---------------------------------------|--|------------------------|
| b. | Habitat improvement projects should not introduce non-native species that could significantly change the natural ecosystem. | A1-CLA-19 |
| c. | Habitat improvement structures should mimic regular occurring natural events (as opposed to catastrophic); e.g. trees falling in the river, boulders falling in or moving down the river course, minor bank sloughing, erosion or undercutting, island building and opening or closing of existing secondary channels. | A1-CLA-20 |
| d. | Habitat improvement structures shall not create unusually hazardous conditions or substantially interfere with existing, or reasonably anticipated, recreational use of the river such as fishing, kayaking, canoeing, rafting, tubing, or swimming. | A1-CLA-21 |
| e. | Beaver dams/dens should be protected where compatible with recreation use. | A1-CLA-22 |
| f. | Beaver transplants should be utilized to expand wetland habitat. | A1-CLA-23 |
| g. | Development, timber harvest, and ground disturbance should be avoided in areas supporting breeding populations of amphibians on the Sensitive Species list. | A1-CLA-24 |
| h. | In timber harvest areas, densities of snags and down logs should be provided at levels that approximate unharvested old-growth natural levels. | A1-CLA-25 |
| i. | Maximum allowable span across river for fish structures shall be 50 percent. | A1-CLA-26 |
| j. | Side channels should be created. | A1-CLA-27 |
| 6. Timber Management | | |
| a. | Regulated timber harvest shall be prohibited. Unregulated timber harvest and salvage activities may occur if it is designed to protect or enhance river values and ensure visitor safety. | A1-CLA-28
A1-CLA-29 |
| b. | Uneven-age management should be considered in highly visible portions. Even-age management may be considered if visual quality objectives are met. | A1-CLA-30
A1-CLA-31 |
| 7. Soil, Water and Air Quality | | |
| a. | Water quality shall be maintained or enhanced (See Forest-wide Water Standards and Guidelines). | A1-CLA-32 |
| b. | Watershed management and improvement projects may be permitted. | A1-CLA-33 |
| c. | All scenic, and recreational rivers segments shall be managed to remain in a free-flowing and unpolluted state. | A1-CLA-34 |

d.	Operation of existing water-related projects (e.g., hydroelectric, municipal, water supply, etc.) shall occur under terms of current license or permit. Opportunities to improve flow conditions of existing hydroelectric projects shall be explored during relicensing.	A1-CLA-35 A1-CLA-36
e.	New water-related projects shall be prohibited on the mainstem Clackamas River. Expansion and/or modification of existing water-related projects shall protect or enhance outstandingly remarkable values.	A1-CLA-37 A1-CLA-38
f.	Construction or operation of new water-related projects shall be prohibited within the corridor, and discouraged in tributaries outside the corridor. All new water-related project proposals or expansions of existing operations in river tributaries shall be subject to a project-specific analysis of potential effects on river values. Projects may be allowed if it is determined that river values remain in optimal condition.	A1-CLA-39 A1-CLA-40 A1-CLA-41
8.	Minerals & Energy Management	
a.	Locatable minerals shall be recommended for withdrawal from development under the mining law (1872 Mining Law) within the corridor for scenic and recreational river segments. Provision shall be made for valid existing mining rights.	A1-CLA-42 A1-CLA-43
b.	Leasable mineral (e.g. geothermal) permits shall include a "No Surface Occupancy" stipulation for that portion of the permit potentially affecting river resource values.	A1-CLA-44
c.	Common variety mineral (e.g. sand and gravel) development shall not be permitted within any river segments.	A1-CLA-45
d.	Plans of Operation for mineral exploration and development shall include reasonable, operationally feasible requirements to minimize conflicts with recreational activities and to protect the character of the landscape within the river corridor.	A1-CLA-46
	(1) Surface occupancy, if allowed, shall be designed to have the least possible effect on river related values.	A1-CLA-47
	(2) Site disturbance from mineral activities shall be rehabilitated within 3 years following project completion.	A1-CLA-48
	(3) During project operation, disturbed soils shall be stabilized prior to the autumn high rainfall season.	A1-CLA-49
e.	All mineral exploration and development shall be done in a manner to protect river resource values.	A1-CLA-50
9.	Geology	
	See Forestwide Geology Standards and Guidelines.	

10. Lands and Special Uses

- | | |
|---|------------------------|
| a. National Forest System lands within river corridors shall be retained. See Forestwide Lands Program Standards and Guidelines. | A1-CLA-51 |
| b. Existing special uses, including recreation and non-recreation uses, may be allowed to continue where consistent with Management Area management direction. Special uses that do not meet Management Area direction shall be terminated or phased out. | A1-CLA-52
A1-CLA-53 |
| c. New special use permits may be issued within all segments when consistent with the Management Area management direction. | A1-CLA-54 |
| d. Construction of new utility and/or transmission lines (e.g. gas lines, geothermal and water pipelines, and electrical transmission lines) should not be allowed within any river segment. | A1-CLA-55 |
| e. Applications for licenses from the Federal Energy Regulatory Commission to construct any impoundment, water conduit, reservoir, powerhouse, transmission line, or other associated hydroelectric facility within any designated river segment shall be recommended for denial. | A1-CLA-56 |
| f. All non-hydroelectric dams not presently authorized by the Forest Service shall be prohibited. | A1-CLA-57 |

11. Transportation Systems/Facilities; Travel and Access Management

- | | |
|---|-----------|
| a. Within scenic segments, new roads and associated facilities and structures are discouraged, but may be constructed when no other reasonable alternative for necessary access exists. | A1-CLA-58 |
| b. Within recreational segments, new roads may be constructed. | A1-CLA-59 |
| c. Within scenic and recreational river corridors, motorized use shall be limited. | A1-CLA-60 |
| (1) Motorized vehicles shall be permitted only on open roads. | A1-CLA-61 |
| (2) Off-road vehicles (ORV) may occur only on designated trails. | A1-CLA-62 |
| (3) Motorized water craft shall be prohibited. | A1-CLA-63 |
| d. Mountain bicycle use should be accepted on designated trails. | A1-CLA-64 |
| e. Pedestrian and equestrian use should be encouraged. | A1-CLA-65 |

12. Fire Prevention and Suppression

- a. Off-road vehicle use may be permitted for emergency fire suppression purposes. A1-CLA-66
- b. Use of tractors to construct firelines may be permitted only in emergency fire suppression situations. Fireline locations shall consider protection of river-related resource values. A1-CLA-67
A1-CLA-68
- c. Fire retardant “drops” should be directed to minimize entry of chemicals into water courses and to protect river values. A1-CLA-69
- d. See Forestwide Forest Protection Standards and Guidelines.

13. Wood Residue Management

- a. See Forestwide Soil Productivity, Wildlife, and Forest Diversity Standards and Guidelines regarding coarse woody debris.
- b. Prescribed burning may occur to protect or enhance river-related values. A1-CLA-70

14. Integrated Pest Management

See Forestwide Timber Management Standards and Guidelines regarding Integrated Pest Management.

Implementation Schedule of the Clackamas River Environmental Assessment/Management Plan contingent upon funding.

Project	Location(s)	Participants	Funding Mechanism	Year(s) Implemented
Hydrology and Water Quality				
Update Forest Hazardous Materials Communication and Action Plans to conform to Plan.	All necessary	USFS	NFSW	1993
Develop cooperative water quality monitoring program.		USFS/USGS/DEQ, others	NFSW	1993
Fisheries				
Bring current structures into compliance with Plan (i.e. extent of channel coverage.)		USFS	NFAF	1993
Anadromous fish habitat improvement.		USFS/BPA	BPA/NFAF	Plan 1993 Implement 1994
Resident trout habitat improvement.	Above RM 75	USFS	NFIF	Plan 1994 Implement 1995
Culvert passage enhancement.	Mag, Tag, Tar, Lowe Creeks	USFS/BPA	CWKV/BPA/NFAF	1994-95
Develop cooperative agreement with ODFW.		USFS/ODFW	NFAF/ODFW	1993
Wildlife				
Design/build "watchable wildlife" projects.	selected osprey nests, trails near beaver dams	USFS	CCS	1994
Implement bird-banding/monitoring station.	corridor	USFS	NFWL	1994
Enhance frost pockets and meadows for forage.	corridor	USFS	NFWL, CCS	1993
Botany and Ecology				
Dispersed site rehabilitation.				
* Identify sites for rehabilitation and NEPA.	Clackamas Ranger District	USFS	NFRN/NFIF	1993
* Implement rehabilitation.	Clackamas Ranger District	FS/volunteers	NFRN/NFIF	1994-95
Willow plantings in riprap.				
* design	Big Cliff to Indian Henry	USFS	partnership	1993
* implement	Big Cliff to Indian Henry	USFS/volunteers	partnership	1994

Project	Location(s)	Participants	Funding Mechanism	Year(s) Implemented
Roadside Vegetation Plan.	corridor	USFS/ODOT	RF Challenge/ODOT	1993
Cultural				
Nominate eligible sites to the National Register of Historic Places.				
	corridor	USFS/SHPO/PGE?	NFCR/PGE?	Every two years, beginning in 1994.
Implement two "Passports in Time" archaeological excavations.				
* plan	to be determined	USFS	NFCR	1994, 1997
* implement	to be determined	USFS/volunteers	NFCR	1995, 1998
Stabilize/rehabilitate sites.				
* identify sites		USFS/Burichard	NFCR	1992-93
* implement		USFS/volunteers	NFCR	1993-95
Recreation and Public Use				
Whitewater use regulation.				
* Replicate OSU Whitewater Study. Revise survey and analysis to better reflect current management questions, and initiate a Limits of Acceptable Change (LAC) process to refine indicators and standards for acceptable social and physical conditions.	corridor	USFS/OSU	USFS	1993
* Necessary follow-up.				1994
* Implement mandatory boater registration.	corridor	USFS/hosts	NFRN?	1993
Recreation facilities.				
Day Use Upgrade/Expansions - Big Eddy, Carter Bridge (including conversion of Carter Bridge Campground), Two Rivers, Big Cliff (new), Carter Bridge Whitewater (new), Fish Creek Curve (new), Dry Ridge TH, Riverside TH (2), Cripple Creek TH, Alder Flat TH.				
* Design Narrative/NEPA	all sites	USFS/public	NRFN	1993-94
* Survey and Design	Big Cliff, Fish Creek Curve, Two Rivers, Riverside THs	USFS	CIP/CCS/CWKV	1994
	Carter Bridge, Carter Bridge Whitewater, Dry Ridge TH, Cripple Creek TH	USFS	CIP/CCS	1995
* Construction	Big Eddy (partial), Alder Flat TH	USFS	CIP	1993

Project	Location(s)	Participants	Funding Mechanism	Year(s) Implemented
	Big cliff, Two Rivers, Riverside THs	USFS/volunteers	CIP/CCS/CWKV	1995
	Carter Bridge, Carter Bridge Whitewater, Dry Ridge TH, Cripple Creek TH	USFS/volunteers	CIP/CCS	1996
Overnight facility upgrade/expansion.				
* Review of needs (to meet ROS/standard maintenance levels/design capacity)	all corridor sites	USFS	NFRM	1994
* Design narrative/NEPA	sites identified in review, Cub Creek (new)	USFS	NFRM	1995
* Survey and design		USFS/volunteers	CIP/CCS/?	1995-98
* Construction		USFS/volunteers	CIP/CCS/?	1996-99
Trail system upgrade/expansion.				
* Urban link trail design narrative/NEPA	full length	USFS/public	CIP	1993
* Survey and design (portions related to corridor)	Forest boundary to Fish Creek	USFS	CIP	Complete
* Construction	Remainder	USFS	CIP	1994
	Forest boundary - Fish Creek	USFS/contractor	CIP	1994-95
	Remainder	USFS/contractor	CIP	1996
* Cripple Creek trail realignment		USFS	CIP/DEMO	
design narrative/NEPA				1994
survey and design				1995
construction				1996
* South Fork Clackamas interpretive trail		USFS/BLM/Oregon City Water Board	CIP/CCS	
design narrative				1994
survey and design				1995
construction				1996
* Big Bottom interpretive trail and trailhead	loop from 4670-155 spur	USFS/ODFW/volunteers	CIP/CCS/NFAF/CWKV	
design narrative				1994
survey and design				1995
construction				1996
* River access upgrades	Sandstone put-in, Memaloose take-out, Bob's Hole parking			

Project	Location(s)	Participants	Funding Mechanism	Year(s) Implemented
design narrative/NEPA		USFS/public	NFRN	1994
survey and design		USFS	CIP/CCS	1995
construction		USFS/volunteers	CIP/CCS	1996
Dispersed Use Areas (see Botany and Ecology section.)				
Information/Interpretation				
* Message/media matching	drainage	interagency/public	CCS	1993
* Develop model brochure (cultural resources), visitor's guide, site interpretive enhancement	drainage, Riverside campground	interagency	CCS/NFRN	1993-94
* Develop remainder of brochures		interagency	CCS/NFAF/NFWF	1994-96
* River orientation station	North Fork viewpoint	USFS/ODOT	CCS	1995
* Reactivate radio information channel		USFS	NFGA	1993
* Clackamas Watchable Wildlife Complex		USFS/Defenders of Wildlife	CIP/CWKV/NFTF/BPA/NFAF	
design narrative				1992
survey and design				1992-93
construction/publication				1993-94
* Fish viewing opportunity	Adjacent to Road 46 near Riverside Campground.	USFS/ODFW	NFAF	1993
* Expand interpretive programs	Two Rivers, Big Bottom	USFS/volunteers	NFSC	1993+
Use Management				
* Administrative Closures	Riverside NRT (bicycles)	USFS	NFRN	1993
* Implement mandatory boater registration	upstream of Forest boundary	USFS/hosts	NFRN	1993 and ongoing
* Update and replicate OSU whitewater study, to determine use limits	Big Cliff to 4650 Bridge	USFS/OSU	NFRM	1993
necessary follow-up	where needed	USFS	NFRM	1994
* Develop cooperative commercial river use management agreement with BLM.	Areas subject to commercial use and affecting BLM lands.	ODOT	FHWA	1995
* Implement expanded (safety, interpretation, etc.) training for seasonal field personnel		USFS/State Patrol/County Sheriff	NFRM/NFCL/CCS	1993

Project	Location(s)	Participants	Funding Mechanism	Year(s) Implemented
Management of private lands				
* Initiate acquisition process for Austin parcel		USFS	NFLA/LALW	1992
* Develop master plan for management of site upon acquisition		USFS/public	NFLA/LALW	1998?
Scenic Resources				
Timber sale to reshape clearcuts outside of corridor				
* plan	Rhododendron Ridge	USFS	USFS	1994
* sell	Rhododendron Ridge	USFS	USFS	1995
Bring roadway material storage areas into compatibility with VQOs				
* review	corridor sites	USFS	NFRD	1993
* implement	target sites	USFS/ODOT	NFRD/ODOT	1994
Bridge repainting (to warm grey color)				
	4 bridges on Hwy 224	ODOT	regular maintenance \$	as scheduled
	Memaloose (Road 45)	USFS	regular maintenance \$	as scheduled
	Fish Creek (Road 54)	USFS	regular maintenance \$	as scheduled
Access and Travel Management				
Foreman Hill reconstruction				
* planning/environmental documentation	Cripple Creek to Ripplebrook Bridge	FHWA	FHWA	1992-93
* construction	Cripple Creek to Ripplebrook Bridge	ODOT	FHWA	1993-95
Road 46 reconstruction				
* bring design into conformance with plan	Ripplebrook Bridge to 63 junction	USFS	CNRN, CNGP, CNTM	1993
* construct	Ripplebrook Bridge to 63 junction	USFS	CIP/coop, CNRN, CNGP, CNTM	1994
Rockfall mitigation				
	Dinner/Deer Creeks area (1.3 miles)	ODOT	ODOT	
Slope stabilization				
	near Roaring River	USFS/ODOT	ODOT	
Timber Management (see also Scenic Resources)				
Plantation thinning (commercial and precommercial)				
	scattered throughout corridor	USFS/contractor	NFGA	1994 and ongoing

Monitoring Schedule - This schedule addresses monitoring needs of the Clackamas River Environmental Assessment/Management Plan. This schedule does not address monitoring that is required, and will occur, due to implementation of site-specific projects in the corridor. Rather, it focuses upon the monitoring necessary to ensure plan objectives are being achieved.

Type	Location(s)	Participants	Funding Mechanism	Start Year	Monitoring Period
Hydrology and Water Quality					
Water quantity/flow regime		Forest hydrologist or district watershed specialist.			
Water quality/temperature		District watershed or fisheries specialists.			
Water quality/turbidity		District or forest watershed specialists.			
Water quality/bacteria		District or forest watershed specialists or district recreation staff.			
Fisheries					
Spawning Surveys (spring chinook, coho, summer and winter steelhead)					
	all river and stream reaches in corridor	USFS	NFAF	1993	annually
Replicate 1991 Habitat Survey	corridor	USFS	NFAF	1996	5 years
Smolt and resident trout habitat capability					
	corridor	USFS/ODFW/PGE	NFAF	1993	annually
Wildlife					
Inspect corridor for bald eagle, peregrine falcon, and osprey nesting success.					
	corridor	USFS/ODFW	NFWL	1993	twice annually
Inspect beaver ponds for new activity, presence of other wildlife spp.					
	corridor	USFS	NFWL	1993	annually
Monitor forage production in known frost pockets and openings.					
	corridor	USFS	NFWL	1993	annually
Monitor elk/deer populations.					
	corridor	USFS/ODFW	NFWL	ongoing	ongoing
Monitor amphibian breeding sites.					
	corridor	USFS	NFWL	1993	annually
Monitor road density.					
	corridor	USFS	NFWL	1992	annually
Recreation and Public Use					
Replicate 1991 traffic counts.					
	ODOT/FS counter sites	USFS/ODOT	NFRN/ODOT	1993	annually
Replicate 1991 response form distribution.					
	corridor	USFS/volunteers	NFRN	1996	5 years
Replicate OSU whitewater study.					
	corridor	USFS/OSU	USFS	1996	3 years

Type	Location(s)	Participants	Funding Mechanism	Start Year	Monitoring Period
Cultural Resources					
Review of target sites (selected from Burchard study) to determine levels of public use on or adjacent to cultural resource sites, and to determine effects of natural events on site integrity.	to be determined	USFS/volunteers	USFS	1994	annually

Participants:

USFS = U.S. Forest Service
 USGS = U.S. Geological Survey
 DEQ = Oregon Department of Environmental Quality
 ODOT = Oregon Department of Transportation
 ODFW = Oregon Department of Fish and Wildlife
 OSU = Oregon State University
 hosts = Clackamas corridor campgrounds hosts
 BPA = Bonneville Power Administration
 SHPO = State Office of Historic Preservation
 vol. = volunteers
 public = representatives of user groups
 cont. = contractor

Funding Sources:

NFAF = USFS Anadromous Fisheries Funds
 NFIF = USFS Inland Fisheries Funds
 BPA = Bonneville Power Administration Contributions
 CWKV = Knutsen-Vendernberg Cooperative Work Trust Funds
 NFRM = USFS Recreation Maintenance Funds
 CCS = Challenge Cost-Share Grant Funds
 RF Challenge = Regional Forester's Challenge Grant
 DEMO = USFS National Forest Demonstration Area Funds
 NFCL = USFS Cooperative Law Enforcement Funds
 NFLA = USFS Real Estate Funds
 LALW = USFS Land and Water Conservation Fund;
 Land Acquisition Funds
 NFGA = USFS General Administration Funds
 NFWL = USFS Wildlife Management Funds
 NFSW = USFS Soil, Water, Air Resource Funds
 NFCR = USFS Cultural Resource Funds
 CNRN = USFS Recreation Roads
 CNTM = USFS Timber Related Roads
 CNGP = USFS General Purpose Roads

Appendix G

References

- Clackamas County Comprehensive Plan
 Natural Resources and Energy Element Section 10.0, *Principal River Conservation Areas*.
 Policies 1.0 thru 9.0.
 Special Zone District (Section 704), *Principal River Conservation Area (PRC)*.
 General Timber District (GTD) (Section 404).
- Cramer, S., A. Maule, and D. Chapman. 1991. The status of coho salmon in the lower Columbia River. Don Chapman Consultants, Inc. Boise, Idaho. 113 pp.
- Debell, D.S., Oliver, C.D., Tappeiner, J.C., Hays, D.W., and Knapp, W.H. 1990. *Silvicultural Guidelines for Managing Northern Spotted Owl Habitat*. 14 pp.
- Department of Environmental Quality (DEQ). 1988. *Oregon Statewide Assessment of Nonpoint Sources of Water Pollution*. Salem, OR.
- Goggans, R. Oregon Department of Fish and Wildlife. 1992. Personal communication.
- Hammond, Geyer, and Anderson. 1982. *Preliminary Geologic Map and Cross Sections of the Upper Clackamas and North Santiam Rivers Area, Northern Oregon Cascade Range*.
- Herb, G. Oregon Department of Fish and Wildlife. 1992. Personal communication.
- Howes, S. 1990. *Mt. Hood National Forest Soil Resource Inventory*.
- Lilly, John E. Waterway Planner, Oregon Division of State Lands. Letter of October 16, 1992.
- Nehlsen, W., J.E. Williams, and J.A. Lichatowich. 1991. Pacific salmon at the crossroads: stocks at risk from California, Oregon, Idaho, and Washington. *Fisheries*: 16: 4-21.
- Oregon Department of Energy. ORS 469.010 thru 469.120.
- Oregon Department of Fish and Wildlife.
 1990. *Columbia Basin System Planning, Public Review Draft: Clackamas River, Willamette River Subbasin: Salmon and Steelhead Plan*.
 1991. *Clackamas Subbasin Fish Management Plan*. Portland, OR. 141 pp.
 (OAR-635-500-810 through 900.)
- Oregon Division of State Lands. State Regulations, ORS 274.005 to ORS 274.590; ORS 390.835.
- Oregon State Marine Board. Administrative Rules, OAR 250-30-30.
- Oregon State Parks and Recreation Division.
 Statewide Comprehensive Outdoor Recreation Plan.
 Proposed Rule OAR 736-40-049.
 OAR 736-40-005 thru 736-40-95.
 ORS 390.835.
 ORS 390.805 thru 390.925.
 1988. *Statewide Comprehensive Outdoor Recreation Plan, 1988 - 1993*.
- Oregon Water Resources Department. 1989. *Scenic Waterways and Wild and Scenic Reaches of the Clackamas River Drainage: A Water Resources Summary*. Salem, Oregon.
- Stone, John. 1991. *Business and Employment Outlook*, Vol. 1 Oregon Employment Division. Salem, OR.

USDA-Forest Service.

Memorandum of Understanding for River Management Between Bureau of Land Management (Oregon State Office), Parks and Recreation Department (Oregon State Office) and USDA-Forest Service. Pacific Northwest Region, 1991.

1982. *Plant Association and Management Guide for the Pacific Silver Fir Zone*. Portland, OR.

1986. *Interim Definitions for Old-Growth Douglas-Fir and Mixed-Conifer Forests in the Pacific Northwest and California*. Pacific Northwest Research Station. Research Note PNW-447.

1986. *The Plant Association and Management Guide for the Western Hemlock Zone*. Portland, OR.

1991. *Columbia River Basin Anadromous Fish Habitat Management Policy and Implementation Guide*. USDA, Forest Service, Regions 1, 4, and 6. 30 pp.

1992. *Final Environmental Impact Statement on Management for the Northern Spotted Owl*. Portland, OR.

U.S. Fish and Wildlife Service

1986. *Pacific Bald Eagle Recovery Plan*.

1982. *Peregrine Falcon Recovery Plan*.

Willamette Kayak and Canoe Club. 1986. *Soggy Sneakers: Guide to Oregon Rivers*. 2nd ed. Portland, OR.

Appendix H

Glossary

A

Access And Travel Management (ATM)

Management of vehicle travel in and through Forest lands. Terms used to define travelway use objectives in ATM plans are defined as follows:

Encourage - To invite use or perform changes to the trail and road system, thereby inviting traffic. Influence specific vehicle type to use the road, trail or area. These are the best locations to use specific vehicle types.

Accept - To allow use, not invite. The road, trail or area is generally adequate for the intended vehicle type.

Discourage - Measures taken to discourage use. Persuade some vehicle types not to use the road, trail or area. These are the least compatible, yet still open, locations for this type of use.

Eliminate - Eliminate traffic. No use by specific vehicle type.

Acre-foot (AF)

A water measurement term equal to the amount of water that would cover an area of one acre to a depth of one foot (43,560 cubic feet).

Allowable Sale Quantity

Or ASQ. The quantity of timber that may be sold from the area of 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. (The allowable sale quantity applies only to the lands determined to be suitable for timber production, and to utilization standards specified in the land and resource management plan.)

Anadromous Fish

Those species of fish that mature in the ocean and migrate into streams to spawn. Salmon, steelhead, and shad are examples.

Aquatic Ecosystems

Stream channels, lakes, marshes or ponds, etc., and the plant and animal communities they support.

Aquatic Habitat

Habitat directly related to water.

Aquifer

A geologic formation or structure that contains and transmits water in sufficient quantity to supply the needs for water development. Aquifers are usually saturated sands, gravel, or fractured rock.

B

Best Management Practices (BMP)

A practice or combination of practices that are the most effective and practical (including technological, economic and institutional considerations) means of preventing or reducing the amount of pollution generated by non-point sources to a level compatible with water quality goals.

Big Game

Those species of large mammals normally managed for sport hunting.

Biological Control

Biological control is the use of parasites, predators, or disease pathogens (bacteria, fungi, viruses, and others) to suppress pest populations.

C

Clearcutting

The harvesting in one cut of all trees in an area for the purpose of creating a new, even-aged stand. The area harvested may be a patch, stand, or strip large enough to be mapped or recorded as a separate age class in planning for sustained yield.

Commercial Thinning

Cutting by mean of sales of products (poles, posts, pulpwood, etc.) in immature forest stands to improve the quality and growth of the remaining stand.

Created Opening

Created openings are openings in the Forest created by the silvicultural practices of shelterwood regeneration cutting at the final harvest, clearcutting, seed tree cutting, or group selection cutting.

Critical Habitat

For threatened or endangered species, the specific areas within the geographical area occupied by the species (at the time it is listed, in accordance with provisions of Section 4 of the Endangered Species Act) on which are found those physical or biological features essential to the conservation of the species. This habitat may require special management considerations or protection. Protection may also be required for additional habitat areas outside the geographical area based on a determination of the Secretary of the Interior that such areas are essential for the conservation of the species.

Cultural Resources

Includes the remains or records of districts, sites, areas, structures, buildings, networks, neighborhoods, memorials, objects and events from the past which have *scientific, historic or cultural value*. They may be historic, prehistoric, archaeological, or architectural in nature. Cultural resources are an irreplaceable and nonrenewable aspect of our national heritage.

Cumulative Effects

The combined effects of two or more management activities. The effects may be related to the number of individual activities, or to the number of repeated activities on the same piece of ground. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

D

Data Recovery

The systematic removal of the scientific, prehistoric, historic, and/or archaeological data that provides a cultural resource property with its research or information value.

Developed Recreation Site Maintenance Levels

Level I - Minimum Level

Operation and Maintenance of developed recreation sites at a level that only meets minimum requirements for public health and safety and does not maintain facilities over time. At this level no funding is provided for upgrading of facilities or completion of any portion of the backlog rehabilitation needs associated with developed sites.

Level II - Low Standard

Operation and Maintenance of developed recreation sites at the level necessary to maintain facilities over time and protect investments in facilities; also complete approximately 50 percent of the backlog rehabilitation needs associated with developed sites.

Level III - Standard Service Level

Operation and Maintenance of developed recreation sites at a level that will ensure normal life expectancy of facilities and at a level that meets Forest Service full service standards of maintenance, service, compliance. Ensures the experience level for which the site is designed and meets other aspects of administration as outlined in Forest Service manuals and regulations. At this level 100 percent of any backlog rehabilitation needs associated with developed sites will be completed.

Dispersed Recreation

Outdoor recreation that takes place outside developed recreation sites or the Wilderness.

Diversity

The distribution and abundance of different plant and animal communities and species within the area covered by a land and resource management plan. (36 CFR 219.3)

E

Earthflow

Large masses of soil moving slowly downslope. A rotational failure which occurs on gentle to moderate slopes.

High Risk - High potential for mass movement. Damage to facilities, loss of life or detrimental effects on fisheries or municipal water sources.

Moderate Risk - Moderate potential for movement. Less a risk of loss of life, damage to facilities or fisheries and municipal water sources encompass many acres.

Low Risk - Small in size. Little risk of loss of life, damage to facilities or fisheries and municipal water sources.

Ecosystem

An interacting system of organisms considered together with their environment; for example, marsh, watershed, and lake ecosystems.

Effects

Environmental consequences as a result of 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 population 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 may be 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 health related, whether direct, indirect, or cumulative. Effects resulting from actions may have both beneficial and detrimental aspects, even if on balance the agency believes that the overall effects will be beneficial (40 CFR 1508.8).

Endangered Species

Any species of animal or plant which is in danger of extinction throughout all or a significant portion of its range. Not included are members of the class Insecta which have been determined by the Secretary to constitute a pest whose protection under the provisions of this Act (Endangered Species Act of 1973) would present an overwhelming and overriding risk to humans. An endangered species must be designated in the Federal Register by the appropriate Federal Agency Secretary.

Endemic Plant

A plant confined to a certain country or region and with a comparatively restricted geographic distribution.

Environmental Assessment

A concise public document required by the regulations implementing the National Environmental Policy Act.

Essential Habitat

Areas designated by the Regional Forester of the Forest Service that possess the same characteristics of critical habitat as those designated by the Secretary of the Interior or Commerce.

Even-aged Management

The application of a combination of actions that results in the creation of forest stands composed of trees of essentially the same age. 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 in 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. (36 CFR 219.3)

F

Fish Passage

Passage of fish up or downstream especially over stream obstructions.

Floodplain

The lowland and relatively flat areas adjoining inland and coastal water including, at a minimum, that area subject to one percent or greater chance of flooding in any given year.

Forage

All browse and non-woody plants available to livestock or wildlife for grazing or harvestable for feed.

Foreground

A term used in visual (scenery) management to describe the stand of trees immediately adjacent to a high-value scenic area, recreation facility, or forest highway (see "Background", "Middleground").

Forest Plan Amendment

Formal alteration of the Forest Plan by modification, deletion or addition based upon non-significant or significant changes. Non-significant changes are minor modification of management direction. Significant changes are major alterations of specific management prescription direction or land use designations. Unlike a complete Plan revision, an amendment addresses only the issues that trigger a need for a change. Amendments must satisfy both NFMA and NEPA procedural requirements, including appropriate public notification.

G

Geothermal

Of or pertaining to the inherent heat of the earth. Geothermal steam is a leasable mineral.

Gradient

Change of elevation, velocity, pressure or other characteristics per unit length.

Group Selection Cutting

Removal of tree groups ranging in size from a fraction of an acre up to about two acres in area that is smaller than the minimum feasible for even-aged management of a single stand.

H

Habitat

The place where a plant or animal naturally or normally lives and grows.

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.

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 in forests. Harvest cutting methods are classified as even-aged and uneven-aged.

History

People, places, things and events which have occurred or pertain to the time of written record. For the Pacific Northwest, the history of written documentation is approximately 1600 AD.

I

Impact, Economic

The change, positive or negative, in economic conditions, including distribution and stability of employment and income in affected local, regional, and national economies, which directly or indirectly results from an activity, project, or program.

Indicator Species

A wildlife management scheme in which the welfare of a selected species is presumed to indicate the welfare of other species.

Integrated Pest Management

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 pest population on various resources values, alternative regulatory tactics and strategies, and benefit/cost estimates for these 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. (36 CFR 219.3)

Interdisciplinary Team

A team of people that collectively represent several disciplines and whose duty it is to coordinate and integrate planning activities.

Intermittent Stream

A stream that flows above ground at intervals or only flows periodically during the year. Intermittent streams generally have well-defined channels.

Irretrievable

Applies to losses of production, harvest, or use 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.

Irreversible

Applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, that are renewable only over long time periods. Irreversible also includes loss of future options.

K

Key Site Riparian Areas

Large riparian areas exhibiting high habitat diversity and outstanding capabilities for producing high quality water, excellent fish spawning and rearing habitat, high quality waterfowl breeding, nesting and resting habitat, wildlife cover and diverse plant communities.

L

Large Woody Debris

Logs, tree boles, and root wads greater than 4 inches in diameter.

Leasable Minerals

All minerals except salable minerals on acquired lands. All minerals on Outer Continental shelf. Coal; phosphate; oil; gas; chlorides, sulphates, carbonates, borates, silicates or nitrates of potassium and sodium; native asphalt, solid and semi-solid bitumen and bituminous rock including oil-impregnated rock or sands from which oil is recoverable only by special treatment after the deposit is mined Geothermal resources.

Legal Trout

A trout six inches or longer is legal by registration in the State of Oregon.

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.

M

Maintenance Levels 1-5 (for roads)

Level 1

This level is assigned to intermittent service roads during the time management direction requires that the road be closed to motorized traffic.

Level 2

This level is assigned where management direction requires that the road be open for limited passage of traffic. Roads in this maintenance level are intended for use by high clearance vehicles and not maintained passenger car traffic.

Level 3

This level is assigned where management direction requires that the road be open and maintained for safe travel by a prudent driver in a standard four-wheel passenger car.

Level 4

This level is assigned where management direction requires the road to provide a moderate degree of user comfort and convenience at moderate travel speeds. Traffic volumes are normally sufficient to require a double-lane aggregate surfaced road. Paved surfaces are often used.

Level 5

This level is assigned where management direction requires the road to provide a high degree of user comfort and convenience. These roads are normally double-lane, paved facilities.

Management Area

An area with similar management objectives and a common management prescription. In Region 6, a management area is the contiguous area assigned to a specific management strategy (the management strategy then becomes the management prescription).

Management Direction

A statement of multiple-use and other goals and objectives, the associated management prescriptions, and standards and guidelines for attaining them. (36 CFR 219.3)

Mass Movement

Downslope, unit movement of a portion of the land's surface; i.e., a single landslide or the gradual simultaneous, downhill movement of the whole mass of loose earth material on a slope face.

MBF

Thousand board feet. A measure of wood volume.

Middleground

The visible terrain beyond the foreground where individual trees are still visible but do not stand out distinctly from the stand.

Mineral Potential

A rating system for mineral resources based on the degree to which certain criteria indicate favorable potential for development of mineral resources.

Mining Claims

That portion of the public estate held by law for mining purposes in which the right of exclusive possession of locatable mineral deposits is vested to the locator of a deposit.

MMBF

Million board feet.

Monitoring

A process to collect significant data from defined sources to identify departures or deviations from expected plan outputs.

Modification

A visual quality objective meaning human activity may dominate the characteristic landscape but must, at the same time, use natural established form, line, color, and texture. It should appear as a natural occurrence when viewed in foreground or middleground.

N

National Environmental Policy Act (NEPA) (1969)

An Act, to declare a National policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate human health and welfare; to enrich the understanding of the ecological systems and natural resources important to the nation; and to establish a Council on Environmental Quality.

National Register - Eligible Property

A property that has been determined eligible for National Register listing by the Secretary of the Interior, or one that has not yet gone through the formal eligibility-determination process but meets the National Register criteria. For management purposes, an "eligible" property is treated as if it were already listed.

National Registry Of Natural Landmarks

National inventory and listing of all or part of recreation areas classified under 36 CFR 294.1 and research natural areas classified under 36 CFR 251.23 which have values illustrating the ecological or geological character of the Nation.

Non-game

Any species of wildlife or fish which is not managed or otherwise controlled by hunting, fishing, or trapping regulations.

Non-point

Refers to area sources of water pollution such as a watershed in contrast to a point source such as an outlet from a factory.

O

Off-road Vehicle (ORV)

Any motorized vehicle designed for or capable of cross-country travel on or immediately over land, water, snow, ice, or other natural terrain.

Non-motorized Mountain Bicycle use is also considered an Off-Road Vehicle.

Old-growth Stand

An old-growth stand is defined as any stand of trees 10 acres or greater generally containing the following characteristics: 1) stands contain mature and overmature trees in the overstory and are well into the mature growth stage; 2) stands will usually contain a multilayered canopy and trees of several age classes; 3) standing dead trees and down material are present; and 4) evidence of human activity may be present but does not significantly alter the other characteristics and would be a subordinate factor in a description of such a stand.

For additional information on how old growth was defined on the Mt. Hood National Forest, see the Forest Plan Final Environmental Impact Statement Chapter 3.

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 of measure. Examples: X06 - Softwood Sawtimber production - MCF; X80 - Increased Water Yield - Acre feet; W01 - Primitive Recreation Use - RVD's.

Outstandingly Remarkable Values

River-related resource value that is rare, unique or exemplary. The value is significant at a Regional or National level.

P

Partial Retention

A visual quality objective where man's activities may be evident but subordinate to the characteristic landscape.

Particulates

A component of polluted air consisting of any liquid or solid particles suspended or falling through the atmosphere.

Patented Mining Claims

A patent is a document which conveys a title. Public law provides that when patented, a mining claim becomes private property and is land over which the United States has no property rights, except as may be reserved in the patent. After a mining claim is patented, the owner does not have to comply with requirements of the General Federal Mining law, but is required to meet State regulations.

Payment In Lieu Of Taxes

Payments to local or State governments based on ownership of Federal land and not directly dependent on production of outputs or receipt sharing. Specifically, they include payments made under the Payments in Lieu of Taxes Act of 1976, P.L. 94-565 Stat. 2662; 31 U.S.C 1601-1607 (Note these payments are in addition to payments made from gross receipts from forest products made under the Twenty-Five Percent Fund Act of May 1908).

Peak Discharge, Peak Flow

The maximum volume of flow attained at a given point in a stream during a runoff event.

Perennial Stream

A stream that flows throughout the year.

Permanent Road Closure

Roads closed with the intent to never use them again, action taken to make them impassable and remove them from the transportation system.

Plant Communities

A vegetation complex unique in its combination of plants which occur in particular locations under particular influences. A plant community is a reflection of integrated environmental influences on the site - such as soils, temperature, elevation, solar radiation, slope, aspect, and rainfall.

Pool Habitat

That portion of the stream with reduced current velocity, often with water deeper than the surrounding areas, and which is frequently usable by fish for resting and cover.

Precommercial Thinning

The selective felling or removal of trees in a young stand, primarily to accelerate diameter increment on the remaining stems, maintain a specific stocking or stand density range, and improve the vigor and quality of the trees that remain.

Prehistory

People, places, things and events which have occurred or pertain to the time before written record.

Prescribed Fire

A wildland fire burning under preplanned 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.

Prescribed Natural Fire

The use of unplanned natural ignitions to meet management prescriptions.

Preservation

A visual quality objective that allows only ecological changes to take place.

Primitive Recreation

Those recreation activities which occur in areas characterized by an essentially unmodified natural environment of fairly large size (2,500 acres or greater).

Programmed Harvest

The part of the potential timber yield that is scheduled for harvesting. Includes salvage and cull timber volumes. It is based on current demand, funding, and multiple use considerations.

R

Ranger District

An administrative subdivision of the Forest, supervised by a District Ranger who reports to the Forest Supervisor.

Raptors

Any predatory bird - such as a falcon, hawk, eagle or owl - that has feet with sharp talons or claws adapted for seizing prey and a hooked beak for tearing flesh.

Recreation Opportunity Spectrum (ROS)

Land delineations that identify a variety of recreation experience opportunities categorized into six classes on a continuum from primitive to urban. Each class is defined in terms of the degree to which it satisfies certain recreation experience needs. This is measured based on the extent to which the natural environment has been modified, the type of facilities provided, the degree of outdoor skills needed to enjoy the area, and the relative density of recreation use. The seven classes are:

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 management restrictions and controls. Motorized use within the area is not permitted.

Semiprimitive Nonmotorized - 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 minimum onsite controls and restrictions may be present, but subtle. 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.

Semiprimitive 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 onsite controls and restrictions may be present, but subtle. Motorized recreation use of local primitive or collector roads with predominantly natural surfaces and trails suitable for motor bikes is permitted.

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.

Roaded Natural - Area is characterized by predominantly natural-appearing environments with moderate evidence of the sights and sounds of man. Such evidence usually harmonizes with the natural environment. Interaction between users may be moderate to high, and 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.

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 to 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 away from developed sites. Facilities for intensified motorized use and parking are available.

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 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.

Recreational Mining

A leisure-time activity involving the search for and collection of mineral specimens using nonsurface disturbing methods.

Reforestation

The natural or artificial restocking of an area with forest trees; most commonly used in reference to artificial restocking.

Regeneration

The actual seedlings and saplings existing in a stand; or the act of establishing young trees naturally or artificially.

Regeneration Cut

Any removal of trees to make regeneration possible.

Regulated Harvest

Harvest that contributes chargeable timber volume to the Allowable Sale Quantity.

Resident Trout

A trout which spends its entire life in fresh water.

Responsible Official

For land management planning purposes, the Forest Service employee who has been delegated the authority to carry out a specific planning action. (36 CFR 219.3)

Retention

A visual quality objective where human activities are not evident to the casual forest visitor.

Riffle

A feature of a stream having swift-flowing, turbulent water; can be either deep or shallow; features are generally cobble or boulder dominated.

Riparian Areas

Geographically delineated areas, with distinctive resource values and characteristics, that are comprised of aquatic and riparian ecosystems. On the Mt. Hood National Forest riparian areas typically include areas adjacent to all streams, lakes, and ponds and areas comprising seeps, springs, and wetlands.

Riparian Ecosystems

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.

Riparian Vegetation

Vegetation growing on or near the banks of a stream or body of water on soils that exhibit some wetness characteristics during some portion of the growing season.

Road

A general term denoting a way for purposes of travel by vehicles greater than 40 inches in width.

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 (FSM 7710.51).

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 multi-resource 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 (FSM 7710.51).

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 (FSM 7710.51).

Rotation Age

The age of a stand when harvested.

S

Salmonid Smolt

Juvenile fish of the salmon/trout family going through biochemical changes during its migration to the ocean.

Sanitation Cutting (Salvage)

The removal of dead, damaged or susceptible trees primarily to prevent the spread of insect pests or diseases and promote forest hygiene.

Second Growth

Forest growth that has come up naturally after some drastic interference with the previous forest growth (e.g., cutting, serious fire, or insect attack).

Sediment

Solid material, both mineral and organic, that is in suspension, and is being transported from its site of origin by air, water, gravity, or ice, or has come to rest on the earth's surface either above or below sea level.

Selection Cut

Selection cutting is the periodic removal of mature trees individually or in small groups from an uneven-aged forest. By this method, both regeneration cutting and tending of immature stand components are accomplished at each entry.

Sensitive Species

Those species of plants or animals that have appeared in the Federal Register as proposed for classification and 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 their being placed on Federal or State lists.

Seral

A biotic community which is a developmental, transitory stage in an ecological succession.

Sheet Erosion

The removal of a fairly uniform layer of soil from the land surface by runoff water.

Shelterwood Cutting

Any regeneration cutting in a more or less mature stand designed to establish a new stand under the protection (overhead or side) of the old stand. Usually the shelterwood involves two separate harvest operations. The first harvest (seed cut) is designed to create space and seed production to establish new trees. The second cut (removal cut) is designed to remove the remainder of the old stand before it begins to compete with the new stand for light and nutrients. This is usually within 10 years.

SHPO

"State Historic Preservation Officer" means the official appointed or designated pursuant to Section 101(b)(1) of the National Historic Preservation Act to administer the State historic preservation program or a representative designated to act for the SHPO. Among other duties, the State Historic Preservation Officer advises and assists Federal agencies and State and local governments and cooperates with these agencies and others to ensure that historic properties are considered at all levels of planning and development.

Silvicultural System

A management process whereby forests are tended, harvested, and replaced resulting in a forest of distinctive form. Systems are classified according to the logging method that removes the mature crop and provides for regeneration and according to the type of forest thereby produced. (36 CFR 219.3)

Silviculture

The art and science of growing and tending forest vegetation for specific management goals.

Snag

A standing dead tree.

Smolt

A young salmon or trout during its migration downstream to the sea after hatching.

Socioeconomic

Pertaining to, or signifying the combination or interaction of, social and economic factors.

Special Emphasis Watersheds

This designation is applied to selected watersheds where special management emphasizes unusually high combinations of riparian resource values and high sensitivity due to generally demanding site conditions and where the goal is to maintain or improve habitat conditions for the sustained, long-term production of fisheries and high quality water.

Stand

Timber possessing uniformity with regard to type, age class, risk class, vigor, size class, and stocking class.

Stream Channel Morphology

The structure or form of a stream channel, as influenced by processes of erosion and deposition of channel materials (gravel, cobbles, sand, soil, etc.).

Stream Class

Classification of streams based on the present and foreseeable uses made 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 mitigation; 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.

Stream Discharge

The volume of water flowing past a point per unit time, commonly expressed as cubic feet per second, million gallons per day, gallons per minute or cubic meters per second.

Stream Scour or Channel Scour

Erosion of the channel bottom and/or banks caused by high flows or water, loss of channel stability, or debris torrents.

Stream Structure

The arrangement of logs, boulders, and meanders which modifies 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.

Streamflow

The flow of water, generally with its suspended sediment load, down a well-defined watercourse.

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, the characteristics of the stream and surrounding terrain, and the type and extent of the planned activity.

Suppression

The action of extinguishing or confining a fire.

T

Threatened Species

Any species of animal or plant which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range and which has been designated in the Federal Register by the Secretary of Interior as a threatened species.

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 (JTU).

U

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. This management must 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. (36 CFR 219.3)

Unregulated Timber Management

Timber cut from those lands that are not organized to provide sustained yields of timber.

V

Viewshed

The total landscape seen or potentially seen from all or a logical part of a travel route, use area, or water body.

Primary Viewshed - The landscape seen from a designated travel route, or designated use area, which has high volume of use, long duration of use, or is a major access to the Forest. The same as Level I Sensitivity to scenic quality.

Secondary Viewshed - The landscape seen from a designated travel route, or designated use area, with low use volume, short use duration, or is a minor access route to the Forest. Same as Level II Sensitivity to scenic quality.

Visual Condition

The visual appearance of a landscape described in terms of the degree of alteration of the natural appearing landscape. These terms are normally used as a summary rating for a large land area, such as a viewshed corridor. Descriptive degrees of alteration are:

Natural Appearing - Area appears untouched by humans; changes are not visually evident. Generally similar to the Retention VQO.

Slightly Altered - Changes may be noticed by the average visitor but do not attract attention. Natural appearance dominates minor disturbances. Generally similar to the Partial Retention VQO.

Moderately Altered - Changes are easily noticed by the average visitor and may attract attention. Disturbances are apparent. Generally similar to the modification VQO.

Heavily Altered - Changes are strong and obvious to the average visitor. Changes dominate the landscape but may resemble natural patterns when viewed from a distance of 3 to 5 miles. Disturbances are major. Generally similar to the maximum modification VQO.

Visual Quality Objectives (VQO)

Categories of acceptable landscape alteration measured in degrees of deviation from the natural-appearing landscape.

Preservation (P) - Ecological changes only.

Retention (R) - Management activities should not be evident to the casual Forest visitor.

Partial Retention (PR) - Management activities 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) - Human activity may dominate the characteristic landscape, but should appear as a natural occurrence when viewed as background.

Enhancement - A short-term management alternative which is done with the express purpose of increasing positive visual variety where little variety now exists.

Visual Resource (Scenery)

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. Visual resource categories include Retention (R), Partial Retention (PR), and Modification (M).

W

Water Quality

The biological, physical, and chemical properties of water that make it suitable for given specified uses. Definition of water quality for forest areas is difficult because of the wide range of downstream uses.

Watershed

The line separating head-streams which flow to different river systems; it may be sharply defined (crest of a ridge), or indeterminate (in a low undulating area).

Wetlands

Areas that are inundated by surface or ground water with a frequency sufficient to support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. (Executive Order 11990.) Under normal circumstances the area does or would support a prevalence of vegetative or aquatic life.

Winter Range

The area available to and used by big game through the winter season.



United States
Department of
Agriculture

Forest Service

Pacific
Northwest
Region



1993

Decision Notice and Finding of No Significant Impact

Clackamas Wild and Scenic River Environmental Assessment and Management Plan

Forest Plan Amendment No. 2

Clackamas/Marion Counties, Oregon

**USDA-Forest Service,
Mt. Hood National Forest
Clackamas and Estacada Ranger Districts**

**Decision Notice
and
Finding of No Significant Impact**

**Clackamas Wild and Scenic River
Environmental Assessment and
Management Plan**

Forest Plan Amendment No. 2

Clackamas/Marion Counties, Oregon

USDA-Forest Service
Mt. Hood National Forest
Clackamas and Estacada Ranger Districts

Table of Contents

Decision	1
Description of Alternative D	2
Reasons for the Decision	4
Other Alternatives Considered	10
Public Involvement	10
Relationship (and Amendment) to Mt. Hood Forest Plan	10
Relationship to Oregon State Scenic Waterway Program and Requirements	11
Finding of No Significant Impact and Compliance with Laws	11
Implementation	12
Right to Appeal	12

In 1968, Congress enacted the National Wild and Scenic Rivers Act to establish a system for the preservation of outstanding free-flowing rivers. In 1988, Congress designated 47 miles of the Clackamas River into the Federal Wild and Scenic Rivers System, and directed the Forest Service to preserve the free-flowing character of the river, protect the water quality, and develop a comprehensive management plan for the protection and/or enhancement of the "outstandingly remarkable values" (ORVs) of the designated river and associated corridor. This Decision Notice designates the management regime for the Clackamas Wild and Scenic River, which was prepared within the guidance of the Wild and Scenic Rivers Act and the National Environmental Policy Act.

The ORVs for the Clackamas Wild and Scenic River are:

- fisheries,
- botany and ecology,
- cultural resources,
- recreation, and
- wildlife.

The portion of the river included in the federal system runs from Big Spring, in the Olallie Lake Scenic Area, to Big Cliff, just upstream of North Fork Reservoir. Congress assigned "Scenic" status to three segments of the Clackamas, and "Recreational" status to three other segments.

In addition to Federal designation, the mainstem of the Clackamas River from the boundary of the Olallie Lake Scenic Area to the North Fork Reservoir was also designated an Oregon State Scenic Waterway in 1988.

Decision

Based upon the analysis documented in the Environmental Assessment, it is my decision to select Alternative D. In doing so, I am:

- delineating a final river boundary,
- stating management objectives in the form of desired future conditions,
- making necessary changes to the Mt. Hood National Forest Land and Resource Management Plan,
- identifying management actions for the various resources, and
- setting in motion the implementation and monitoring schedules for these management actions.

All projects are subject to budget availability and site-specific environmental review.

Description of Alternative D

This alternative continues much of the intent of current corridor management under the Forest Plan, in that it seeks to protect/enhance the outstandingly remarkable values, protect water quality and the river's free-flowing characteristics, and maintain the character necessary to support the "Recreational" and "Scenic" classifications assigned by Congress. It retains all current "underlying" management area classifications, including bald eagle and pine marten management areas, riparian enhancement emphasis areas, areas of concern due to earth movements, and others. In addition, it makes some changes to current management by: removing all National Forest lands in the corridor from "regulated" timber harvest (harvest may still occur, but numerical production commitments have been eliminated); adopting a corridor boundary more responsive to resource protection needs; of the two types of recreation settings allowed for "Scenic" segments, the more "primitive" has been chosen and management and development guidelines further defined.

Alternative D also focuses the broad direction in the Forest Plan (applicable to all designated rivers on the Forest), to better respond to the unique values and issues associated with the Clackamas, and set in motion a management and use regime better suited to river stewardship into the 21st century. The general focus is to emphasize public use, services, and developments in the corridor on those users highly dependent upon a "natural" forest setting and river environment, with moderate recreational conveniences in the lower river corridor, and an emphasis on a less affected setting and heightened ecosystem function in the upper corridor. Specific aspects of this management regime are described as follows:

Hydrology and Water Quality

Alternative D restates authorities set forth in the Wild and Scenic Rivers Act related to water resource projects in the corridor, and sets the stage for the criteria to be used to evaluate proposals beyond the corridor boundary. It provides a progressive approach to water quantity and quality monitoring, and encourages quantification and reservation of instream flows to protect river values.

Fisheries

Alternative D continues the implementation of Forest Plan actions designed to enhance anadromous fish habitat, biological integrity and function of riparian areas. Areas targeted (and methods recommended) for structural fish habitat enhancement are listed, and are designed to accommodate most concerns from kayaking groups. Current ODFW fish stocking practices are assumed to continue, but are one aspect included in a list of items to be reviewed in proposed cooperative implementation of ODFW's Clackamas Subbasin Plan, as well as other regional agreements (e.g. Salmon Summit and Policy Implementation Guide).

Wildlife

Enhancements to wildlife management in the corridor focus upon an active effort to document current and potential occurrences and habitat of bald eagle and peregrine falcon, add protection to sensitive amphibian species, continue and enhance current big game management activities, and develop watchable wildlife opportunities. One Pine Martin management area is added to the Forest-wide network.

Botany and Ecology

Management activities relating to botany and ecology under Alternative D focus upon protecting and enhancing known populations of Threatened, Endangered, and Sensitive species and their habitat, increasing the prevalence of native species in the corridor, and restoration of impacted areas. As a portion of the latter category, management includes an evaluation of past and current recreational use of river corridor areas, with a strong mandate to invoke a

creative combination of management strategies to reduce inconsistencies between this use and riparian health.

Cultural Resources

Protection of cultural resources will continue as required by Forest Service policy and applicable laws, with increased emphasis on stabilization and rehabilitation of known sites. In addition, Alternative D adds a focus upon public involvement in cultural resource excavations, as well as active expansion of cultural resource representation in interpretive programs and opportunities.

Recreation and Public Use

Upstream from the Indian Henry Campground area, Alternative D includes selection of the more "primitive" of the two types of recreation "settings" allowed under the Forest Plan. Development guidance and management goals are defined in more detail than the Forest Plan. The emphasis is upon maintaining current overnight capacity in the corridor, expanding day-use opportunities, and upgrading current facilities, both in appearance and function. Priorities for new development, and/or de-investment are based on a "nodal" concept, with highest service and convenience in the Estacada/Promontory Park area (off-Forest), second highest at Ripplebrook/Three Lynx/Indian Henry area, and third at Fish Creek/Carter Bridge area. Trail-based, interpretive, and viewing opportunities would be expanded, and an active public information strategy implemented. A mandatory registration program would be implemented to document levels and characteristics of river use, and provide a baseline for determining and equitable approach to use limitation, if such actions are necessary.

Management of Private Lands

The Forest Service in Alternative D is making the acquisition of the Austin parcel a high priority in the land acquisition program, with future use to focus upon public safety and resource protection -- day use only. In addition, this Alternative documents State Parks' commitment to increased scrutiny of land management and development practices in the corridor, subject to State Scenic Waterway requirements and County regulations.

Scenic Resources

The goal of visual resource management in the corridor is to reduce the influence of non-natural aspects of the corridor on views from the river, road, and trails, through design criteria, plantings, maintenance controls, and site enhancements. Scenic resources in the corridor under Alternative D will be managed to maintain a near natural appearing landscape. The removal of lands from scheduled timber harvest will help retain the mature forest character. Restoration of damaged riparian areas and riprapped highway fills will improve scenic conditions.

Access and Travel Management

Several changes have been made to the roadway management plans as envisioned under existing Forest Plan direction. Past objectives for State Highway 224 and Forest Road 46 included achieving State highway construction standards to the Carrigan's curve area, meaning a wider and faster roadway, with up to six-foot shoulders. It has been made clear in Alternative D, that the desired driving experience for Highway 224 and Forest Road 46 is not to get from one point to another in the least amount of time, but to provide a slower more meandering trip, with intended speeds and design accentuating driving through a natural setting. In addition, proposed roadway expansions above the junction of Forest Road 46 and Forest Road 63 (turnoff to Bagby and Bull of the Woods), have been reconsidered. Expansion planned for Forest Road 46 will increase safety for bicycles, while minimizing necessary landform disturbance. Closures of roads not considered necessary for long term resource management is already occurring, with Alternative D adding additional closures in sensitive areas. Some guidance is presented for cooperation with ODOT in roadway management, including preferred bank and cliff stabilization methods; a Memorandum of Understanding will be prepared with ODOT to more specifically address these areas, and ensure implementation of the intent of the Plan. Designation of Highway 224 and Forest Road 46 (Estacada to Detroit) as a National Scenic Byway is encouraged, but with a low emphasis on related developments.

Timber Management

Alternative D removes the corridor from "regulated" timber harvest. The corridor will not be managed for timber production. Timber harvest may occur, if designed to protect or enhance river values and/or ensure visitor safety. If harvest proposals meet these criteria, even-aged management will only be considered if visual quality objectives can be met. Silvicultural prescriptions in the corridor will seek to maintain a continuous forest cover, with old-growth characteristics. Upstream of Indian Henry, all naturally-occurring materials falling into the river will remain; downstream of this point, and adjacent to all (upstream and downstream) developed campgrounds, only materials posing imminent danger to users of facilities will be altered or moved to mitigate hazard.

Boundary

Lastly, Alternative D includes a modified river corridor boundary, tailored to provide wider protection zones where needed, and narrower areas where such protection is not necessary.

Reasons for the Decision

I approached my decisions by first reviewing the outstandingly remarkable values and the issues identified in the planning process by the public and agencies. I examined how the various alternatives respond to the ORVs and issues. I present my rationale for these decisions in the same manner below. Based on my assessment Alternative D best maximizes net public benefits. It provides a balanced level of diverse benefits and it is most responsive to public issues. No single factor or individual consideration or issue has dominated my decision. I reviewed the environmental consequences of the preferred alternative and Wild and Scenic River Management Plan, to the best of my knowledge, complies with all legal requirements applicable to the Forest and in particular the National Wild and Scenic River Act.

The reasons for choosing the preferred alternative are discussed below on an issue by issue basis. The following discussions summarize many of the important factors which I considered. **They explain why I believe Alternative D provides the best mix of management options to meet the requirements of protecting and/or enhancing the ORVs of the river corridor.**

Issue: *Development and Maintenance of State Highway 224 and Forest Road 46*

Highway 224 and Forest Road 46 are used as the primary access for the Portland metropolitan area to upriver recreation. It is a primary haul route for timber and forest products. It provides access to popular recreation destinations like Bagby Hot Springs, Olallie Lake Scenic Area and Timothy Lake. It is also a popular alternative scenic route to Bend and Central Oregon.

The development and maintenance of the highway has had significant and permanent effect on the outstanding river values and scenic quality of the corridor, especially as viewed from the river.

On the other hand, this highway accommodates one of the highest commercial and recreation traffic volumes of any forest highway in Oregon or Washington. Not only is single use traffic volume high, such as recreation, but the mix of traffic is potentially hazardous and a challenge for designers. Many segments of the road must simultaneously accommodate log trucks, recreation vehicles, buses, bicycles, maintenance vehicles, and parking as well as passenger cars.

I have decided to allow planned roadway expansions only up to the Road 63 junction with Road 46, described in Alternative D. This will allow for safe year round access to destinations such as Bagby Hot Springs while retaining the slower-paced experience of a scenic byway, especially above Road 63 junction. This decision also provides for construction methods, maintenance, and bank stabilization treatments that emphasize natural non-structural techniques and maximizes protection and rehabilitation of riparian vegetation and maintenance of high water quality.

I am encouraging the nomination of State Highway 224 and Forest Road 46 from Estacada to Detroit, Oregon as a National Scenic Byway.

By this decision, I am directing the Estacada and Clackamas District Rangers to develop a memorandum of understanding with ODOT regulating highway maintenance activities to protect and enhance the ORVs, in particular riparian vegetation and water quality.

Alternatives A and C proposes additional major reconstruction of Forest Road 46 for ten miles of road above the Road 46/63 junction. This portion of Road 46 is a seasonal use road due to snowfall. As log haul traffic decreases, the existing traffic is expected to remain relatively stable through the next decade. It is my decision that expansion of Forest Road 46 above the junction with Road 63 would be expensive, create additional impacts on the ORVs and not be justified based on projections of future use. Alternative B would not allow any reconstruction above Ripplebrook. The segment of Forest Road 46 (Ripplebrook RS to Forest Road 46/63 junction) provides year round access to Bagby Hot Springs. The present condition of this segment has deteriorated badly due to earthflow instability and blocks anadromous fish passage at three stream crossings. Alternative D will correct these problems and is consistent with the Forest Road 46 project as planned.

Issue: *Accommodating Greater Numbers of Recreationists*

The Mt. Hood National Forest is one of the eleven forests identified by the Forest Service as meeting the urban forest characteristics of being located within 50 miles of populations greater than one million people. The Clackamas River is one of two major drainages on the Mt. Hood National Forest that meet this criteria. The Clackamas River is unique in its proximity to Portland, easy accessibility and high amount of public land ownership. **Recreation is recognized as an outstanding remarkable value.**

Many public responses have expressed concern that the Forest is not increasing the number of developed recreation sites to accommodate growing demand. Many groups feel that construction of additional campground facilities and reconstruction of existing campgrounds should be high on the list of priorities for investment in the drainage. Others feel the degree of development and type of recreation experience should not be allowed to change. Facilities and vegetation in some developed sites are deteriorating due to heavy use and inadequate maintenance.

Conflicts can arise between recreation uses and other management activities, as well as between different types of recreation uses. The conflict between kayak use and mid-stream fisheries structures is an example.

The Clackamas drainage provides a large portion of the semi-primitive motorized, roaded natural, and roaded modified recreation opportunities in the Mt. Hood National Forest. These are also the closest opportunities for dispersed recreation on public lands from the Portland area.

It is my decision to attempt to accommodate that portion of the existing and projected recreation demand that is dependent upon a natural forest or river setting. The preferred alternative would concentrate investment in developed facilities at nodes such as Estacada/Promontory Park and the Indian Henry/Ripplebrook areas. The emphasis would be through reconstruction and limited expansion of existing facilities rather than new facilities. Some existing facilities that are inconsistent with the ORVs, low use or uneconomical, may be phased out.

Dispersed recreation use, particularly adjacent to the river, will be accommodated where consistent with the other ORVs. Where use has caused degraded riparian conditions or threatens water quality, access and use will be controlled, limited, or eliminated.

The trail system will be expanded. The urban link trail from the Portland area to the Pacific Crest Trail will be encouraged. The potential location for such a trail will be limited to the west bank of the river between Indian Henry Campground and the mouth of the Collawash River. The Riverside National Recreation trail will be limited to foot traffic only.

Instream fish habitat structures will be designed to provide safe boat passage.

It is my decision to implement a mandatory registration system to determine the carrying capacity of the river. Until the capacity is determined, no additional river outfitter/guide or trips/persons per outfitter will be allowed. Any future use allocations will ensure equitable access for both private and guided users.

Alternative A does not adequately address many of the recreation issues, such as whitewater use, day use areas, and river use administration. Alternatives B and E would close and/or constrain much of the overnight and day use in the riparian zone. These alternatives would also essentially preclude kayaking on the Clackamas River above Ripplebrook Ranger Station. Alternative C would encourage more development and increased use in the river corridor. Given past adverse impacts to the ORVs, I have concluded that Alternative D best maintains the range of existing recreation opportunities while protecting and enhancing the other ORVs.

Issue: *Role of Timber Management*

Timber harvest has occurred within and adjacent to the corridor over the last 70 years. Most of the harvest occurred within the old-growth type forest. Silvicultural techniques were largely limited to small openings and individual tree selection. Salvage harvest of windthrow and insect kill has occurred on a regular and extensive basis throughout the corridor.

Timber harvest has impacted the scenic quality and riparian vegetation in the corridor. These impacts have been limited in scope and temporary in nature.

The Forest Plan overlapped land allocations and their associated objectives, standards and guidelines. None of these allocations have timber as a primary objective. This was an attempt to minimize the impact of land allocations for resource objectives other than timber on the allowable sale quantity. The highest density of "overlapping" land allocations in the Mt. Hood National Forest are in the Clackamas corridor. Near Ripplebrook there are up to six overlapping reduced harvest land allocations. The stacking of land allocations with multiple resource objectives and timber harvest constraints makes management of timber as a planned output not practicable.

The Clackamas River corridor supports an important old-growth ecosystem and a key old-growth corridor for the region. Timber production would reduce both the amount and value of the old-growth forest ecosystem in the corridor.

The amount of timber harvest scheduled in the corridor by the Forest Plan amounts to 650 MBF/year or about .3% of the Forest allowable sale quantity.

In my judgment any level of planned timber production (Alternative A) would be inconsistent with the protection and enhancement of old-growth ecosystem values of this river corridor. It is also highly unlikely the Forest Plan estimated could ever have been achieved given the high number of overlapping land allocations. It is my decision to create a new Forest Plan management area allocation which has no timber production goals.

It is also my decision to not preclude the selective harvest of trees that are high risk to safety along roads and in recreation sites. Selected trees may also be harvested for use in fish habitat projects. All harvest activities must be done consistent with protecting and enhancing all the ORVs.

Issue: Restoration and Re-establishment of Native Fish Populations

Fish habitat within the Clackamas River corridor, as well as the tributaries which feed it, is renowned for its high quality. The Forest has had a long-standing strong commitment to rehabilitate and enhance fish habitat in the Clackamas drainage. There have been extensive rehabilitation and enhancement projects in tributaries such as Fish Creek, Collawash River, Oak Grove Fork, and Pinhead Creek as well as the upper Clackamas River.

The Forest Plan set aside about 2,000 acres of key site riparian habitat along the Clackamas River with the primary objective of protecting and enhancing fish and riparian habitat, the majority of which occurs in the Big bottom area.

The anadromous fishery resources are classified as "outstandingly remarkable values" in the legislation establishing the Clackamas as a Federal Wild and Scenic River. The principle reason for including the Clackamas fishery as an ORV was the late-run coho salmon, believed to be the last significant wild late-run coho stock remaining in the Columbia River Basin. There are four additional runs of anadromous fish.

The existing top quality habitat, including constructed habitat such as pools, cover logs, and side channels, is far from fully utilized. This is due to limiting factors other than habitat within the river corridor or existing water quality.

This issue generated more public comment than any other. Opinion was split between support of Alternative D and even higher emphasis on fish and ecosystem protection. The fisheries section of the EA were rewritten to clear up confusing parts and to elaborate on questions received.

Alternative B maximizes the opportunities to rehabilitate and enhance anadromous fish habitat. However, it would unnecessarily limit or exclude certain recreation uses such as kayaking above Ripplebrook. All alternatives protect and enhance the water quality of the

Clackamas River and provide high quality anadromous fish habitat potential well above the existing or projected fish population levels. Quality habitat and water quality conditions are not the limiting factors for anadromous fish production in the upper Clackamas River. Alternatives A and E present a somewhat higher risk to anadromous fish habitat due to development.

It is my decision, by selecting alternative D, to continue to strengthen protective measures by implementing revised standards and guides for the Forest Plan. It is also my decision to continue aggressive rehabilitation and enhancement of anadromous fish habitat wherever opportunities exist. I believe this can be accomplished and provide for the safe passage of rafts and kayaks.

It is my judgment that the selected alternative is consistent with, and will implement the Salmon Summit Commitments and the Columbia River Basin Anadromous Fish Habitat Policy and Implementation Guides.

Issue: *Protection of the Old-Growth Forest Ecosystem*

The Clackamas River corridor supports an important old-growth forest ecosystem. In particular, the Big Bottom area represents an example of forest vegetation area historically common along Cascade rivers. **The 1990 Resource Assessment for the Clackamas River found botany and ecology to be an outstandingly remarkable value based on the old-growth stands.**

There are several regionally listed sensitive plant, wildlife, amphibian, and fish species, and a few federally listed (Oregon candidate) plant and wildlife species in the Clackamas corridor.

Both the old-growth ecosystem and its associated sensitive, threatened and endangered species could be adversely affected by road and recreation development as well as timber harvest.

It is my decision to flex the boundary of the river corridor to incorporate as many of the ecologically significant old-growth stands, riparian areas and high value anadromous fish habitat as possible and stay within the legislated limits of averaging no more than 320 acres/mile of river. I believe this will allow for the maximum protection and enhancement of the ORVs and make it more manageable by following identified features and describable landmarks.

The selection of the preferred alternative (Alternative D) protects the old-growth forest by removing all of the land in the corridor from timber production. In addition to the one special old growth (A7) stand identified in the Forest Plan, I have decided to designate three additional stands of old growth which have special significance.

Issue: *Protection of High Quality Water and Improvement of Riparian Areas*

Water quality of the Clackamas River, especially above the mouth of the Collawash River, is regionally renowned as excellent throughout the year. The Clackamas River provides high quality water for more than 500,000 domestic and municipal water users, a fish hatchery, electric power generation, irrigation, recreation and fish habitat. The riparian vegetation supports a highly productive fish and wildlife habitat.

The riparian habitat of the Clackamas River has been heavily altered, and in some cases, eliminated by activities such as road construction, recreation use and timber harvest.

By selecting Alternative D, it is my decision to not only continue the emphasis on protecting riparian vegetation and water quality as outlined in the Forest Plan, but to place increased emphasis on rehabilitation of impacted sites, bioengineering of revetments and revegetation of hardened riprap sites. Alternative B is the only alternative that does a better job of protecting and improving riparian areas. However, in my judgment, the additional benefits to riparian habitat are minor compared to the impacts of major reductions in overnight and day use in the corridor and exclusion of kayaking above Ripplebrook.

Issue: *Assisting Local Economic Development*

The town of Estacada is the only established community near the Federally designated portion of the Clackamas River. Estacada is a community undergoing dramatic change as the timber supply from public lands decreases and the population growth as a "bedroom community" of Portland increases.

The economies of nearby communities are built predominantly on a mixture of service, timber industry, light manufacturing, utility (PGE) and Forest Service jobs. Overall, Clackamas County has a strong diversified economy. Smaller communities such as Estacada are still tied to resource-based employment. Roughly half of the county's labor force commutes to work in Portland. As economic and population growth expands east and south of Portland the economies of the Clackamas River communities will diversify. However, the natural resources for hunting, fishing, other recreation activities, tourism, and wood products will continue to play a significant role in the economy of the Estacada area.

The main tourist and recreation attraction in the corridor is the river itself with associated fishing, whitewater boating, and camping opportunities. The Clackamas River campgrounds, trails, outstanding fishing and boating draw thousands of recreationists a year. Annual events like Bob's Hole Whitewater Rodeo and The Clackamas Whitewater Festival draw participants and spectators from several western states.

The same values which attract visitors, are also put at risk by over use and development. Riparian vegetation and water quality can and have been impaired by over use by recreationists. To provide safe and efficient transportation, past road construction has affected, and in some cases eliminated, riparian vegetation and fish habitat.

Many people who currently use the river corridor do not want to see the existing conditions change or additional development. However, they also say the remoteness, uncontrolled, uncrowded conditions are why they come to the Clackamas River corridor.

Some have suggested a high level of development in the corridor as a means to enhance economic stability in the corridor. It is my feeling that maintaining as "natural" a feel as possible in the corridor will encourage further development of a lodging and service base in Estacada, while maintaining the natural features these visitors seek.

In my judgment, Alternative D strikes the best balance between accommodating some additional recreation and tourism use while taking effective measures to protect and enhance outstanding remarkable values. This will ensure that the Clackamas River corridor is a quality attraction for recreation and tourism in the future. Development is limited to nodes of existing development, some on the Forest, such as the Indian Henry/Ripplebrook area, and some off Forest, such as the Estacada/Promontory Park area. The natural resources and features of the corridor will continue to be the attraction, with goods and services provided in the the local community.

Issue: Protection and Enhancement of Cultural Resources

Both prehistoric and historic cultural resources were identified as outstandingly remarkable values. Prehistoric sites date between 11,000 to 14,000 years ago up to historic American Indian uses. Historic sites fall into three categories: railroad/road building, hydro-electric facilities, and Forest Service structures.

By selecting Alternative D, prehistoric sites will be protected. Historic sites, until they are formally evaluated, are regarded as significant and eligible for inclusion on the National Register of Historic Places. I am also encouraging PGE to evaluate the significance of the Three Lynx town-site and consider opportunities for interpretation and education.

Other Alternatives Considered

I considered five alternate management strategies for the corridor. Alternative A (the No Action Alternative) was merely a continuation of current management. Alternative B emphasized more active efforts to control levels of use, a lower development scale in the corridor, and active efforts to bring the corridor closer to a natural functioning ecosystem. Alternative C formed the opposite end of the spectrum, with a focus on development and user convenience. Alternative D provides a middle-of-the-road strategy, with Alternative E differing only slightly from D with higher access controls to river areas in the upper corridor, slightly lower accommodation of kayaking concerns in the upper river, and a slightly higher level of recreation development in the lower river area.

Public Involvement

Public involvement has been, and continues to be, a critical part of river management planning and implementation. Private citizens, interest groups, state and local governments, other agencies, and tribal groups were all consulted both formally and informally throughout the development of the Resource Assessment and the Environmental Assessment/Management Plan.

Relationship (and Amendment) to Mt. Hood Forest Plan

The Forest Service is responsible for overall land management responsibilities on National Forest lands. The 1990 Mt. Hood National Forest Land and Resource Management Plan (Forest Plan) provides direction for management programs, practices, uses and protection measures on the Forest. The Forest Plan recognized the five designated wild and scenic rivers on the Mt. Hood National Forest with a special management area designation ("B1-Designated Wild and Scenic Rivers"), and incorporates the general guidance of the Wild and Scenic Rivers Act into "standards and guidelines" for the B1 Management Areas.

The Clackamas Wild and Scenic River EA/Plan documents the results of the analysis of management options for the river and designated corridor. A new Management Area ("A1-CLA-Clackamas Wild and Scenic River Corridor") has been created through this process, and the Forest Plan is hereby amended to create this new area, to be managed according to the Desired Future Condition and Standards and Guidelines found in Appendix F of the EA/Management Plan. Forest Plan amendments are considered "significant" when there is either a major change in projected Forest "outputs", or when there is determined to be a significant change in management direction.

The level of outputs between the Forest Plan (Alternative A) and Alternative D are minor including the decision to preclude the corridor from programmed timber harvest. The change in outputs for timber are less than .3 of one percent from the Forest Plan. Forest Plan management direction has been refined and expanded to cover issues not covered under the Forest Plan such as river use and administration. All the existing Forest Plan land allocations, standards and guidelines except B1 (Wild and Scenic River) have been retained. The B1 has changed to A1-CLA to reflect the change in timber harvest direction, expanded desired future condition and refined standards and guidelines. In my judgment neither the outputs nor direction has changed enough to be considered a significant amendment.

Relationship to Oregon State Scenic Waterway Program and Requirements

Finding of No Significant Impact and Compliance with Laws

The State Scenic Waterway program is administered by the Oregon State Parks and Recreation Department. State Parks has worked cooperatively with the Forest Service to identify the special values of the Clackamas and to determine a best course of action for their protection, as related to the the Scenic Waterway program.

The EA analyzes the consequences of alternative management regimes for the federally designated portion of the Clackamas. This decision for the designated Wild and Scenic River portion of the Clackamas, provides protection of river-related values at a level that meets or exceeds the goals of the State Scenic Waterway program. To serve the public, the Mt. Hood National Forest and State Parks have cooperatively developed the Clackamas Wild and Scenic River EA/Management Plan. That document displays information related to management of the portions of the river under federal, and combined state/federal designation.

Following a review of the Environmental Assessment, I have determined that this is not a major federal action that will significantly affect the quality of the human environment. Therefore, an environmental impact statement is not necessary and will not be prepared. This determination is based on the following considerations:

- Irreversible and irretrievable commitments of resources and adverse cumulative or secondary effects will not exceed those discussed and evaluated in the Final Environmental Impact Statement for the Mt. Hood Forest Plan.
- Direct, indirect, and cumulative environmental impacts were analyzed and discussed in the Environmental Assessment and were not found to be significant.
- There will be no significant impacts to wetlands, floodplains, prime farm lands, range lands, minority groups, women, or consumers.
- Activities planned in the Wild and Scenic River corridor will not adversely affect the environment beyond or downriver from the designated corridor.
- River Management Plan direction is not expected to cause any significant adverse impacts to any threatened, endangered, or sensitive plant or animal species. Site-specific biological evaluations will be done for specific projects planned in the corridor.
- The River Management Plan is in compliance with relevant Federal, State, and local laws, regulations, and requirements designed for the protection of the environment. The River Management Plan meets the State of Oregon water and air quality standards.

Biological evaluations for animals and plants have been completed and are included in the analysis file of the Environmental Assessment. These evaluations assess the impacts of the River Management Plan on all threatened, endangered, and sensitive species that could potentially be found in the Wild and Scenic River corridor. The evaluations include a conclusion that proposed management is not expected to cause any adverse effects to these species. Further site-specific surveys and appropriate interagency consultation will be conducted as necessary during project planning.

Implementation

Implementation of this decision may begin 30 calendar days after the Decision Notice appears in The Oregonian.

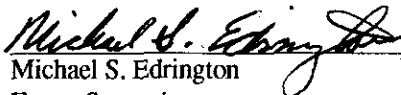
Each project identified in the EA/Management Plan will require additional environmental analysis prior to implementation, with the appropriate levels of analysis, in compliance with National Environmental Policy Act requirements.

Right to Appeal

This decision is subject to appeal pursuant to 36 CFR 217. Any written Notice of Appeal of this decision must be fully consistent with 36 CFR 217.9 (Content of a Notice of Appeal) and must include the specific reasons for appeal. A written Notice of Appeal, in duplicate, must be filed with the Reviewing Officer, John Lowe, Regional Forester, P.O. Box 3623, Portland, Oregon 97208-3623, within 45 days of the date upon which legal notice of this decision appears in The Oregonian.

For further information, please refer to the Clackamas Wild and Scenic River Environmental Assessment and Management Plan, and/or contact Paul Norman, Wild and Scenic Rivers Administrator, 503-666-0731.

Responsible Official:



Michael S. Edrington
Forest Supervisor
Mt. Hood National Forest
2955 NW Division
Gresham, OR 97030

4/19/93
Date