RESTORATION 2003
ENVIRONMENTAL ASSESSMENT

Title: Restoration 2003

Lead Agency: U.S.D.A. Forest Service, Mt. Hood National Forest

Responsible Officials: Gary L. Larsen
Forest Supervisor
Mt. Hood National Forest
16400 Champion Way
Sandy, OR 97055
(503) 668-1700

and

Daniel T. Harkenrider
Scenic Area Manager
Columbia River Gorge National Scenic Area
902 Wasco Ave. Suite 200
Hood River, OR 97031
(541) 386-2333

For Further Information: John Dodd
6780 Highway 35
Parkdale, OR 97041
(541) 352-6002
jdodd@fs.fed.us

Abstract: The proposed action involves many wildlife, fish habitat and water quality restoration projects. Projects are located across the Mt. Hood National Forest, the Oregon portion of the Columbia River Gorge National Scenic Area, and some projects are on adjacent private lands.

Table of Contents

CHAPTER 1 - PURPOSE AND NEED FOR ACTION

Introduction

This Environmental Assessment (EA) includes many wildlife, fish habitat and water quality restoration projects. In 1994, the Northwest Forest Plan (NFP) recognized the need for Watershed Restoration. "Watershed restoration will be an integral part of a program to aid in recovery of fish habitat, riparian habitat, and water quality. Restoration will be based on watershed analysis and planning." (NFP p. B-30) "The most important components of a watershed restoration program are control and prevention of road-related runoff and sediment production, restoration of the condition of riparian vegetation, and restoration of in-stream habitat complexity." (NFP p. B-31)

The Mt. Hood National Forest (Forest) has accomplished numerous restoration projects in the past few years including road decommissioning, culvert replacement for improved fish passage, in-stream projects to create pools, riparian planting, etc. In the previous decade, the Forest decommissioned about 12% of its roads. The watershed analyses recommended these restoration actions and many others that have not yet been funded or implemented. The Columbia River Gorge National Scenic Area has also accomplished numerous restoration projects.

This assessment also includes off-Forest restoration projects because it is recognized that many serious restoration needs occur off-Forest. Recent legislation makes this a reality: The Secure Rural Schools and Community Self-Determination Act of 2000 (P.L. 106-393) directs funding to these types of projects. The text of this act can be viewed at http://www.fs.fed.us/r6/fremont/rac/106_393.html.

Many projects are grouped collectively into this EA for efficiency and to facilitate analysis of cumulative effects and benefits. The following section demonstrates that these projects are "similar actions" because of their common goal to enhance wildlife habitat, fish habitat and water quality. Some of the projects listed here will qualify for categorical exclusion (FSH1909.15.30) and a decision memo will be issued. One or more decision notices may be issued for the remaining projects.

This assessment is tiered to the Mt. Hood National Forest Land and Resource Management Plan (hereafter referred to as the Forest Plan), as amended by the Standards and Guidelines of the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl as amended (hereafter referred to as the Northwest Forest Plan or NFP), and The Management Plan for the Columbia River Gorge National Scenic Area (1992).

The following statements represent desired conditions derived from higher order plans.

- **Watersheds** have hydrologic and sediment regimes that function within their ranges of natural variability. They contain a network of healthy riparian areas and streams.

- **Streams** provide a diversity of aquatic habitat for fish and other stream-dwelling

organisms. They offer sufficient quantities of large woody debris; they have clean and abundant spawning gravel; and they have stable banks that are well vegetated and have cool water.

- **Riparian areas** contain plant communities that are diverse in species composition and structure. They provide summer and winter thermal regulation; nutrient filtering; and have appropriate rates of surface erosion, bank erosion, and channel migration. They also supply coarse woody debris sufficient to sustain physical complexity and stability. Riparian reserves provide mature forest connectivity.

- A **transportation** system allows safe access through the Forest where appropriate, and it is carefully designed and maintained to minimize impacts to aquatic and terrestrial forest resources.

- Landscapes contain a diversity of **habitats**.

Purpose and Need

The need for wildlife habitat, fish habitat and water quality restoration is evident when the above desired conditions are compared to existing conditions at site-specific locations:

- The Forest has streams and rivers that provide habitat for important stocks of fish, many of which are listed under the Endangered Species Act. Many of the streams and rivers also provide water for human uses. Certain watersheds are designated as Key Watersheds where restoration efforts are a high priority.

- Hydrologic regimes, riparian vegetation, aquatic habitats, and wildlife habitats have been altered by:

    - Roads
    - Timber harvest
    - Rock quarry developments
    - Grazing
    - Irrigation diversions

- Some roads have culverts that block or impede fish passage.

- Some streams have low levels of in-stream large woody debris, inadequate recruitment of future woody debris, and poor aquatic habitat conditions.

- Some stands of coniferous forest do not have the desired levels of large down logs and snags.

- Some oak stands are being invaded by conifers.

The **purpose** of this proposal is to repair specific problem areas that have been identified as the most urgent. The objective is to have healthy functioning watersheds that provide clean water, quality fisheries and wildlife habitats. Another objective is to provide a safe transportation system that meets resource objectives while providing access through the Forest. It is recognized that it may take many years of action and many years of "healing time" to totally restore these resources. The projects described below are one step in the process of moving toward the desired conditions.

Projects have been grouped by type to more clearly and efficiently discuss objectives, issues and effects. The following section has more detail on the specific objectives for each project type.

Fish Passage/Culverts

Some roads have culverts or other structures that block or impede fish passage or are not large enough to accommodate a 100-year flood event and associated sediment and debris. These projects involve the design and installation of structures that allow passage of fish and other channel related material. There is an urgent need to upgrade 40 structures that would improve fish passage on many miles of streams. There are additional miscellaneous culverts that would be replaced during road repairs or removed during road decommissioning that would also help meet this need.

Fencing

Livestock are naturally attracted to streams, meadows and other sensitive areas where their use often causes damage to streambanks and riparian areas. These projects include the construction of fences to control livestock movement within these sensitive areas.

Ditch Piping

Irrigation systems were developed many years ago to divert stream water into ditches to deliver water for agricultural use. These projects involve converting ditches to pipes to transport water more efficiently and installing fish screens. An estimated quantity of conserved water would be returned to the stream and would be guaranteed through a written agreement with the irrigator.

Quarry Rehabilitation

Quarries were developed to provide rock for roads and other developments. When they are no longer needed, restoration of these sites is appropriate. These projects may include recontouring by filling with soil, shaping for drainage and/or installation of waterbars. Sites would also be revegetated. Vehicular access to sites would be blocked with a berm or other device. Three quarries are identified for rehabilitation.

Roads

Some roads have been damaged by severe storm events, are causing resource damage, or are unsafe. Roads would be repaired where cost, level of use and resource considerations warrant. This includes heavy maintenance and deep patch repairs to stabilize cracked or sinking road surfaces. Projects may also include the placement of additional cross drain culverts, increasing existing culvert size and the stabilization of cut and fill slopes. There is an urgent need to repair approximately 19 miles of roads.

Other roads would be decommissioned where repair would not likely solve the problem, where repair is not cost effective, or where roads are no longer needed. This may involve the removal of gravel surfacing and culverts if present, and the deep scarification of road surfaces. It may also include pulling back unstable fill slopes to prevent future landsliding. Berms would be constructed to block vehicular access and disturbed soils would be revegetated. There is an urgent need to decommission approximately 14 miles of roads.

In-stream

In-stream conditions are sometimes not optimal for fish. Streams can be improved by replacing lacking elements or by repairing existing features. Projects include the installation of logs or boulders in the stream, riparian planting, riparian thinning and the maintenance of side channels. There are 15 project areas that need treatment.

Vegetation Management and Wildlife Habitat

Habitats for plants and animals change over time to conditions that are less than optimal. Projects include the removal of small conifers that are invading oak stands and the creation of snags and down logs in areas that have low levels of these components.

Proposed Action

The proposed action includes many projects. The objectives for the projects are discussed in the previous section. The proposed action is alternative 2 and tables listing each project can be found in Chapter 2. Maps showing general project vicinities can be found in Appendix A. Site-specific maps and detailed project descriptions can be found in the analysis file.

Scoping

In 2002 and 2003, the proposal was published in several issues of the Mt. Hood National Forest publication Sprouts and the Columbia River Gorge National Scenic Area's Gorge Views. In February of 2003, letters were mailed to Federal, State and local government agencies, tribal governments, organizations and citizens describing the proposed projects and soliciting comments. No comments were received.

Issues

No key issues were identified through scoping. Key issues are those that would influence the development of alternatives to the proposed action.

The interdisciplinary team did identify one concern – impacts to water quality and fish habitat. There is a concern that ground disturbance associated with restoration projects, particularly where they happen close to streams and rivers, may result in short-term sedimentation and increased turbidity until erosion control measures take effect.

CHAPTER 2 - MANAGEMENT ALTERNATIVES

Alternatives Considered but Not Fully Developed

Consideration was given to a much longer list of projects. The proposed action does not fully restore watersheds: there are known restoration opportunities that are not included and there are conceptual proposals for restoration that are not yet fully developed to the point where analysis can proceed. The logistics involved with project design, field survey work and the available funding also contributed to the shaping of the proposed action. Many roads were considered for decommissioning but were deferred until after completion of a Forest-wide Roads Analysis.

Consideration was given to include only projects that had certain funding. This would have been a much shorter list of projects. The sources of potential funding are many and varied and it was decided to pursue a longer list of projects knowing that funding may materialize in the near future.

Consideration was given to an alternative that would defer all road decommissioning until after the Scenic Area and Mt. Hood Forest-wide Roads Analysis. This was not fully developed because this would not meet the purpose and need. Certain roads with their impact on fish and water quality are high priority for restoration and would likely be identified as such in a Forest-wide Roads Analysis. The project-level roads analysis demonstrates that the included roads are not needed for resource management and are contributing to sedimentation.

Alternative 1 (No Action)

Alternative 1 is the "no action" alternative. Under this alternative, no restoration activities would occur.

Alternative 2 (Proposed Action)

The following restoration projects would be implemented. Individual projects are displayed in tables below organized by general restoration project type.

Project Type: **Fish Passage/Culverts**

Some road crossings or other structures block or impede fish passage. These projects involve the design and installation of a better structure. Refer to text after these tables for explanation of seasonal restrictions.

MAP ID	5th Field Watershed	Project Name Road/Creek	Seasonal Restrictions	Notes These projects qualify for categorical exclusion under 31.1b-4. * culvert removed and not replaced.
C-1	East Hood	3520.650/Robinhood	2	*
C-2	East Hood	3500.681/Meadows	2, 4	* Two Culverts, replaced with log ski bridge
C-3	East Hood	3520/Robinhood	2, 4	*
C-4	East Hood	Hutson Dr/Evans	2, 4	Off-Forest
C-5	Mill	1700.663/N Fork Mill	2, 4	*
C-7a	Badger/Tygh	2700/Jordan	2, 3, 4	
C-7b	Rock/3mile	4820/Gate	2, 3, 4	
C-8	Rock/3mile	4830/S Fork Gate	2, 3, 4	
C-9	Rock/3mile	4811/Threemile	2, 3, 4	
C-10	Mill	1721/S Fork Mill	2, 4	
C-11	Miles	4400/Eightmile	2, 4	
C-12	West Hood	1600/Tony	2, 4	
C-13	West Hood	1800/Red Hill	2, 4	
C-14	West Hood	1800/Marco	2, 4	
C-15	West Hood	1800/McGee	2, 4	
C-16	West Hood	1300620/Laurel	2, 3, 4	
C-17	West Hood	1350/Laurel	2, 4	
C-25	Columbia	1520/Bridal Veil	2, 3, 4	Nine culverts
C-26	Low Clack	4600.267/Tag	2, 3, 4	*
C-29	Low Clack	4620/Whale	2, 3, 4	
C-30	Zigzag	Kiwanis/L ZZ River	2, 4	Two culverts
C-37	Bull Run	1010/Deer	2, 3, 4	
C-38	Bull Run	10/Deer	2, 3, 4	
C-39	Bull Run	1210/S F Bull Run	2, 3, 4	
C-40	Sandy	1825.380/Cast	2, 3, 4	
C-41	Bull Run	10/Cougar	2, 3, 4	
C-42	Bull Run	1010/Cougar	2, 3, 4	
C-44	Bull Run	10/Bear	2, 3, 4	
C-45	Bull Run	1010/Bear	2, 3, 4	
C-47	Mill	N Fork Mill	2, 3, 4	

Project Type: **Fencing**

These projects include the construction of fences to control livestock movement within sensitive areas such as streams and meadows**.**

MAP ID	5th Field Watershed	Project Name	Seasonal Restrictions	Notes These projects qualify for categorical exclusion under 31.2-9.
F-2	Rock/3mile	Wildcat Exclosure	3, 4	

Project Type: **Ditch Piping**

These projects involve converting ditches to pipes to transport irrigation water more efficiently.

MAP ID	5th Field Watershed	Project Name	Seasonal Restrictions	Notes
P-1	Miles	Wolf Run @Eightmile	2, 4	
IR-1	15mile	Lyda Ditch	2, 4	15 Mile River Keeper, Off-Forest

Project Type: **Quarry Rehabilitation**

These projects would include recontouring by filling with soil, shaping for drainage and/or installation of waterbars. Sites would also be revegetated. Vehicular access to sites would be blocked with a berm or other device.

MAP ID	5th Field Watershed	Project Name	Seasonal Restrictions	Notes
Q-1	Columbia	1520 road	3, 4	
Q-2	Columbia	1500.020 @ Larch Mt	4	
Q-3	Columbia	2130.105. near The Dalles		

Project Type: **Road Repair**

This includes heavy maintenance and deep patch repairs to stabilize cracked or sinking road surfaces. Projects would also include the placement of additional cross drain culverts, upgrading existing culverts and the stabilization of cut and fill slopes.

MAP ID	5th Field Watershed	Project Name (Road Number)	Seasonal Restrictions	Notes These projects qualify for categorical exclusion under 31.1b-4.
RR-2	White	4891 rd to Bonnie Butte	4	
RR-3	West Hood	13/1310 repair	3, 4	
RR-4	White	Repair rd into Devils Half Acre, upgrade culvert to bridge	2, 4	

Project Type: **Road Decommission**

This would involve the removal of gravel surfacing and culverts if present, and the deep scarification of road surfaces. It would also include pulling back unstable fill slopes where needed to prevent future landsliding. Berms would block vehicular access and disturbed soils would be revegetated.

MAP ID	5th Field Watershed	Project Name (Road Number)	Seasonal Restrictions	Notes
RD-1	White	Fishhook Roads – obliterate most of system.	1, 4	
RD-2	White	Convert 4300.221 to trail and obliterate 3530.240.	1, 2, 4	
RD-3	Columbia	1400/1405, 1500.020, 2130.105, 8400.217, and one in Rowena.	1, 3, 4	
RD-4	Oak Grove	4610.240/250 @ Shining Lake trailhead	4	
RD-5a	Lower Clackamas	4640.012	1, 2, 4	
RD-5b	Collawash	6322.170	1, 2, 4	
RD-6	Salmon	User created road from end of 2618	4	
RD-7	Roaring	Twin Springs	1, 4	
RD-8	Sandy	Aschoff Rd./1820	1, 2, 4	

Project Type: **In-stream/Riparian**

Streams would be improved by replacing lacking elements or repairing problem areas.

MAP ID	5th Field Watershed	Project Name	Seasonal Restrictions	Notes
IR-1	15 Mile	15 Mile Riverkeeper	1, 2	LWD, Repair flood damaged channel, Lyda Ditch Piping, Road Closure via gating, Off-Forest
IR-2	East Hood	Robinhood Cr LWD	1, 2, 4	
IR-3	West Hood	Bear Cr riparian thin	4	
IR-4	West Hood	McGee Cr riparian thin	4	
IR-5	West Hood	Lake Branch riparian thin	4	
IR-6	Columbia	Eagle Creek planting fish privacy screen	3, 4	This project qualifies for categorical exclusion under 31.2-5.
IR-7	Columbia	Multnomah Falls riparian planting		This project qualifies for categorical exclusion under 31.2-5.
IR-8	Upper Clackamas	Upper Clackamas LWD	1, 2, 3	Between Big Bottom and Collawash
IR-9	Sandy	Summit Guard Station	1, 2	Channel repair near parking lot
IR-10	Salmon	Salmon Riverkeeper	1, 2	Resort @ The Mt/Wee Burn Creek, Off-Forest
IR-11	Salmon	Arrah Wana	1, 2	Build upstream U's in Salmon River to water rehab reach, Off-Forest
IR-12	Salmon	Side channel maintenance –Salmon River	1, 2, 3, 4	
IR-13	Zigzag	Zigzag River	1, 2, 3, 4	LWD and boulders
IR-14	Zigzag	Little Zigzag River	1, 2, 4	LWD, boulders, bank stabilization, PCT riparian conifers
IR-15	Sandy	Clear Cr	1, 2	Off-Forest, LWD, boulders, planting

Project Type: **Vegetation Management**

MAP ID	5th Field Watershed	Project Name	Seasonal Restrictions	Notes
V-1	Columbia	Rowena		This project qualifies for categorical exclusion under 31.2-6. Remove small conifers from oak stands using hand loppers.

Project Type: **Wildlife**

MAP ID	5th Field Watershed	Project Name	Seasonal Restrictions	Notes These projects qualify for categorical exclusion under 31.2-6.
W-1	West Hood	Talc TS snag and LWD creation		
W-2	Several (Clackamas)	Four snag and LWD creation projects	3	

Mitigations

Seasonal Restrictions

1. **Erosion**: No ground based equipment would be used within Riparian Reserves between Oct. 1 and June 15 to limit the likelihood of surface erosion and sediment transport and reduce the intensity and duration of anticipated short-term turbidity increases. This restriction may be waived with the concurrence of a soil, watershed or fisheries specialist, if long periods of dry weather are anticipated. This restriction applies to the following projects: RD-1, RD-2, RD-3, RD-5a, RD-5b, RD-7, RD-8, IR-1, IR-2, and IR-8 through IR-15.

2. **Fish**: In-stream projects would only occur within work timing guidelines for in-stream projects set up by Oregon Department of Fish and Wildlife (ODFW) to protect incubating fish eggs and spawning fish. In-stream work would occur within the following periods: East Fork Hood River, Columbia River, Lower Clackamas and Upper Clackamas Rivers, Zigzag River, Bull Run River, Sandy River, Salmon River and Collawash River - July 15 through August 31, West Fork Hood River - July 15 through August 15, Mile Creeks, Badger/Tygh Creeks, Rock/Threemile Creeks, White River, Fifteenmile Creek - July 1 through October 31, and Mill Creek Watershed – July 1 – Sept. 30. This restriction may be waived if ODFW biologists concur and a documented waiver is granted by either the National Oceanic and Atmospheric Administration (NOAA) Fisheries or the U.S. Fish and Wildlife Service. This restriction applies only to the portion of a project where in-stream work is conducted and not to other project phases such as road paving. This restriction applies to the following projects: all Culvert Replacements, all Ditch Piping, RD-2, RD-5a, RD-5b, RD-8, RR-4, IR-1, IR-2, IR-8 through IR-15.

3. **Deer and Elk**: No equipment would be operated in certain special winter range areas between December 1 and March 31. This winter range restriction applies to projects C7a, C7b,

C-8, C-9, C-16, C-25, C-26, C-29, C-37 through C45, F-2, Q-1, RR-3, RD-3, IR-6, IR-8, IR-12, IR-13, IR-15 and W-2.

4. **Northern Spotted Owl**: To minimize impacts to owls during the critical breeding season, no equipment would be operated between March 1st and July 15th. This restriction applies to all projects except: C-1, Q-3, IR-1, IR-7, IR-8, IR-9, IR-10, IR-11, and IR-15. These projects are exempt from this restriction because they meet one or more of the following three criteria: 1) the project is greater than ¼ mile from unsurveyed suitable habitat; 2) the area around a project is surveyed and the project is found to be greater than ¼ mile from any activity centers; or 3) the project does not generate noise above the ambient noise level.

Other Mitigation Measures

5. During the culvert replacement projects, stream flow would be guided or diverted away from the reconstruction site. Flow would be restored to the reconstructed stream course once construction is complete. Excavated materials would be removed from the flood plain. Erosion control devices would be installed to capture and reduce downstream transport of fine sediments.

6. To reduce erosion, bare soils would be revegetated. Grass seed and fertilizer would be evenly distributed at sites of soil disturbance. Steeper slopes that have bare soils would also have mulch applied to ensure successful establishment. Effective ground cover would be installed prior to October 1 of each year.

7. To minimize the spread of noxious weeds the following actions would be taken for all projects where applicable.

   a. Control weeds as necessary at project sites.

   b. To reduce risk of spreading weed infestations, begin project operations in uninfested areas before operating in weed-infested areas.

   c. Locate and use weed-free project staging areas. Avoid or minimize all types of travel through weed-infested areas, or restrict to those periods when spread of seed or propagules are least likely.

   d. Determine the need for, and when appropriate, identify sites where equipment can be cleaned. The cleaning requirement applies to equipment or vehicles that are used off roads. Vehicles that remain on roads would not need to be cleaned. Clean equipment before entering National Forest System lands; a Forest Officer, in coordination with the Unit Invasive Species Coordinator, would approve use of on-Forest cleaning sites in advance. Seeds and plant parts would be collected when practical and incinerated. Remove mud, dirt, and plant parts from equipment before moving it into a project area.

   e. Clean equipment, before leaving the project site, if operating in areas infested with weeds. Determine the need for, and when appropriate, identify sites where equipment can be cleaned. Seeds and plant parts would be collected when practical and

incinerated.

f. Workers would inspect, remove, and properly dispose of weed seed and plant parts found on their clothing and equipment. Proper disposal means bagging the seeds and plant parts and incinerating them.

g. Coordinate project activities with any nearby herbicide application to maximize cost effectiveness of weed treatments.

h. Evaluate options, including closure, to regulate the flow of traffic on sites where desired vegetation needs to be established.

i. Inspect material sources (such as gravel pits) on site, and ensure that they are weed-free before use and transport. Treat weed-infested sources for eradication, and strip and stockpile contaminated material before any use of pit material.

j. Inspect and document the area where material from treated weed-infested sources is used, annually for at least three years after project completion, to ensure that any weeds transported to the site are promptly detected and controlled.

k. Maintain stockpiled, uninfested material in a weed-free condition.

l. Retain native vegetation in and around project activity to the maximum extent possible consistent with project objectives.

m. Minimize soil disturbance to the extent practical, consistent with project objectives.

n. Revegetate disturbed soil (except travelways on surfaced projects) in a manner that optimizes plant establishment for that specific site. Define for each project what constitutes disturbed soil and objectives for plant cover revegetation.

o. Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and weed-free mulching as necessary. Use native material where appropriate and feasible. Use certified weed-free or weed-seed-free hay or straw where certified materials are required and/or are reasonably available. Always use certified materials in areas closed by administrative order. Where practical, stockpile weed-seed-free topsoil and replace it on disturbed areas (e.g., road embankments or landings)

p. Use local seeding guidelines to determine detailed procedures and appropriate mixes. To avoid weed-contamination, a certified seed laboratory needs to test each lot against the all-State noxious weed list to Association of Seed Technologists and Analysts (AOSTA) standards, and provide documentation of the seed inspection test. There are plant species not on State and Federal noxious weed lists that the Forest Service would consider non-native invasive weeds. Check State and Federal lists to see if any local weeds need to be added prior to testing. Seed lots labeled as certified weed free at time of sale may still contain some weed seed contamination. Non-certified seed should first be tested before use.

q. Inspect and document all limited term ground-disturbing operations in noxious weed infested areas for at least three (3) growing seasons following completion of the project. For on-going projects, continue to monitor until reasonable certainty is obtained that no weeds have occurred. Provide for follow-up treatments based on inspection results.

r. Avoid moving aquatic weed plants from one body of water to another.

8. Avoid fertilizer use in close proximity to live streams and wetlands. According to NOAA Fisheries and U.S. Fish and Wildlife Service standards, chemical fertilizer should not be applied within 50 feet of live water.

9. Culvert replacements, bridges and other stream crossings would be designed to accommodate at least the 100-year flood event, including associated bed load and debris where there is a high risk of debris flows. Culvert replacement in fish-bearing streams would be designed for stream simulation.

10. A site specific Spill Prevention Control and Countermeasure Plan for project sites and staging areas would be developed. If fuels are stored in the project area, the Forest Service would approve the site in advance. Appropriate measures for containment, such as berms and catch basins with plastic liners would be used.

11. Where project design within Riparian Reserves involves excavation of existing topsoil, special efforts would be taken to restore the site. The topsoil with its accompanying large woody debris would be removed and stored nearby. Prior to completion of project, the topsoil and large woody debris would be placed back onto suitable areas to facilitate revegetation.

12. All projects would comply with the State Water Quality Standards.

13. All known heritage resources would be protected. Should heritage resources be located during project implementation, project activities would be halted until consultation with the Forest Archeologist can determine appropriate site-specific mitigation.

14. To minimize effects to white water river users, logs used for in-stream restoration projects would be placed so that they do not cross the entire channel.

15. Leave a 20’ strip of uncut vegetation adjacent to all perennial and intermittent streams to maintain stream temperature and bank stability. Any additional thinning would be designed to avoid increase of stream temperature.

16. Surveys for plant and animal species and heritage resources are ongoing and would be completed prior to the signing of decision documents. Protection measures would be designed and implemented where practical.

CHAPTER 3 - ENVIRONMENTAL CONSEQUENCES

Fish and Water Quality Effects of Alternative 1 (No Action)

Alternative 1 would not meet any of the goals described in the purpose and need section. The objective of moving toward healthier watersheds would not be met. Declining fish runs would not be assisted in recovery by any habitat improvements. Roads may fail causing landsliding and further degradation of watershed conditions. It is recognized that it would take many years of restoration effort to fully meet the goals of watershed recovery. Alternative 1 does not take any steps in that direction.

Fish Passage Barriers

In stream systems that currently have partial or full fish passage barriers due to inadequate stream crossings, fish would continue to have problems moving throughout the stream system. These impediments result in under utilization of spawning and rearing habitats and hinder the broad exchange of genetic material throughout the population. When culverts are too small to accommodate a 100-year flood event, there is the potential for culverts to become plugged, possibly resulting in washout and damage to the aquatic environment. Washouts would introduce a pulse of sediment into the stream system and cause degradation of downstream aquatic habitat.

Riparian Areas With Livestock Impacts

Livestock are naturally attracted to streams, meadows and other sensitive areas where overuse can cause damage to the aquatic system. The impacts associated with livestock use include removal or degradation of riparian vegetation, stream bank sloughing, and erosion. This has the potential to increase fine and coarse sediment input, increase stream temperature and dry up meadows and other riparian areas due to channel incision.

Ditches

Ditches would continue to leak and washout causing erosion. The practice of withdrawing extra water for irrigation to compensate for leakage and evaporation would continue. This in turn has the potential to increase stream temperature and, under extreme conditions, dry up sections of streams due to dewatering. Ditch water would continue to seep into the ground beneath the ditches and contribute to landslides where ditches traverse steep side-slopes. These landslides, if large enough, would transport sediment off the hillslopes and into the streams below.

Quarries

Quarries would continue to be sources of erosion and sediment. Quarries that are located in riparian areas have the additional risk of introducing sediment into surrounding surface water and ultimately degrading aquatic habitat.

Roads

Roads that have been damaged by severe storm events, are causing resource damage, and can also be unsafe for vehicular traffic. Resource damage is commonly in the form of increased fine and coarse sediment introduction. Other sections of road have cracked and failing roadfills and have the potential to introduce sediment at some future point by slope failure or surface erosion. This condition would continue. Approximately 19 miles of roads would continue to deteriorate.

In-stream and Riparian Projects

In-stream conditions would continue to be less than optimal for fish. There would be inadequate pools, large woody debris, and shade. Side channels would be dewatered or heat up during the dry season killing fish that seek refuge in these areas. Conifers in riparian areas that are being out-competed by other tree species would grow at a slower rate and recruitment of large woody debris to the stream would be delayed. Also, the amount of shade that these conifers would provide to the stream would be reduced.

Effects to Threatened or Proposed Fish and Essential Fish Habitat

Listed fish and essential habitat would continue to be negatively affected by sediment.

Cumulative Effects

Alternative 1 would not contribute to short-term cumulative effects since no ground disturbance would occur but it would also not contribute to long-term cumulative benefits. Long-term detrimental cumulative effects would occur and would progressively get worse as time goes by if problem areas are not treated.

Fish and Water Quality Effects of Alternative 2 (Proposed Action)

Cumulative Effects Discussion For Fish and Water Quality

Cumulative effects are additive through time and space. They are the impacts of the proposed action when added to other past, present, and reasonably foreseeable future actions across a larger landscape regardless of who undertakes those actions. This section is a summary of the cumulative effects analysis efforts that have been conducted and documented through watershed analysis.

Approximately 30 watershed analyses have been completed across the Forest. A concerted effort was made to consolidate this information into a Forest-wide analysis. It describes the current condition and it describes past resource impacts.

The following parameters were modeled:

- **Watershed sensitivity** was evaluated by looking at inherent features of the natural landscape that could contribute to a concern about fish or water quality.
- **Management Intensity** evaluated roads, timber harvest and grazing in terms of their proximity to streams and riparian areas.
- **Biological factors** relating to fish habitat and fish presence were included.

Projects have been proposed in the following 5th field watersheds that scored high in terms of priority for restoration: Lower Clackamas River, Upper Clackamas River, Collawash River, Oak Grove Fork Clackamas River, White River, and West Fork Hood River. Projects have been proposed in the following 5th field watersheds that scored moderate in terms of priority for restoration: Miles Creek, East Fork Hood River, Sandy River, Salmon River, Bull Run River, Zigzag River, Roaring River, Badger-Tygh Creek, Columbia Gorge Tribs East, Mill Creek, Columbia Gorge Tribs West and Rock-Three Mile Creek. Projects were also included off-Forest where there was a clear and urgent need for restoration action.

Cumulative Benefits

Chapter 1 describes the objective of all of the included projects as having healthy functioning watersheds that provide clean water and sustain quality fisheries. (Several sections below elaborate on the direct and indirect benefits of the listed projects to these resources.) Watershed restoration is an ongoing process, not just this short list of projects, but a series of efforts that span the previous decade and the decades to come.

- Some restoration has been completed, but time is needed for vegetation to grow before the full recovery is complete.
- Some projects have been planned but not yet implemented.
- Some projects are in the early planning phase and would be implemented in the coming years.
- Efforts are underway to restore streams and riparian areas on private property.

There are other efforts underway that are not restoration projects but would result in having healthier watersheds that provide clean water and sustain quality fisheries.

- The process of relicensing hydropower facilities would likely result in improved conditions for fish through improved fish passage facilities at dams, increased in-stream flows, and habitat mitigation projects.
- As forest management occurs, standards and guidelines and regulations require state-of-the-art practices to be implemented.

The result is a trend of improving conditions for fish and water quality. Beneficial effects include long-term improvements to water quality, fish habitat and riparian areas, restored fish passage for all life stages of threatened and proposed species, re-established connectivity of fish populations above and below human-made barriers, restoration of hydrologic function, more natural routing of wood and sediment through stream systems, a decrease in drainage network,

and a reduction in sediment delivery to streams.

Cumulative Impacts

Many restoration projects result in short-term sedimentation until erosion control measures take effect. Other projects that occur in the same watersheds such as timber harvest and road construction have the potential to contribute cumulatively to the sediment load moving down streams and rivers.

Projects on federal lands would be designed to be consistent with the Aquatic Conservation Strategy of the Northwest Forest Plan and Best Management Practices. The harvest level in recent years has been well below the level projected by the Northwest Forest Plan for a number of reasons including appeals, litigation and areas established for survey and manage species. The short-term sedimentation associated with restoration projects when combined with all other sources would not likely result in harm to fish habitats or water quality for the following reasons:

- Each project would contain mitigations to minimize or eliminate sources of erosion by applying grass seed and/or mulch to areas of bare soil.
- Some projects would be designed to avoid ground disturbance by using helicopters or low impact ground based equipment.
- Riparian reserves would be delineated and associated Aquatic Conservation Strategy Objectives would be met.
- Seasonal restrictions would be observed where appropriate to accomplish work during the dry season.

Restoration projects, timber harvest and road construction on federal land would incorporate these protections where appropriate.

There are many sources of sedimentation in the portions of watersheds that are privately managed. Timber harvest and road building would meet the standards of the Oregon Forest Practices Act that contains many provisions to minimize erosion. Farming, orcharding, grazing, and land development are other potential sources of sedimentation.

All activities that may produce potential sources of sedimentation, whether public or private, would likely occur widely dispersed geographically and chronologically, therefore concentrations of sediment in any given watershed at any given time would be unlikely. The projects would be implemented over multiple years in a number of different watersheds. The recovery from short-term effects from one project may be complete by the time another project in the same watershed is implemented. In addition, some of the projects would result in immediate benefits such as projects repairing riparian areas damaged by vehicles and some road repair projects and these would offset the short-term sediment inputs of other projects.

The majority of the restoration projects repair human created features of the landscape. Many restoration projects fall in 5th field watersheds that have had the greatest intensity of management.

The proposed action involves the placement of logs in streams to create pools and enhance diversity. The intent is to replicate the natural process of adjacent trees falling into or across a stream. It is the Forest's current practice to not recruit wood from streamsides but to bring it in from other areas. Sources may include trees that fall across roads and must be removed, logs that float into reservoirs, logs from ongoing timber sales or down trees adjacent to roads. Logs may also be purchased or acquired from off-Forest. There currently are stockpiles of logs available for this and other restoration projects. The process is opportunistic and ongoing: as logs become available they are stockpiled and used as needed. Acquiring the logs from these sources is more expensive but has a lower environmental effect than recruiting them from adjacent riparian areas since trees there provide shade to streams and other benefits. The environmental analysis and documentation under the National Environmental Policy Act for the acquisition of logs is separate from this EA and was either completed previously or is ongoing.

Fisheries

Existing Conditions

The waters of the Mt. Hood National Forest provide important habitat for native populations of fish in over 1,600 miles of streams. Approximately 300 miles of streams support anadromous fish populations. Past land management activities have had impacts on watersheds throughout the Forest, but natural conditions and processes, such as highly erodible soils, also dictate current conditions. Management activities, which have had negative impacts on fish and aquatic resources, include road building, timber harvest, water diversions, hydroelectric development, grazing, and recreation.

There are 12 Tier One, Key watersheds, on the Mt. Hood National Forest. These watersheds identified in the Northwest Forest Plan, provide refugia habitat that is critical for the conservation of at-risk anadromous salmonids, bull trout, and resident fish species, as well as having a high potential for successful watershed restoration. These "key" watersheds support six federally listed salmon and trout "evolutionarily significant units" (ESU's) under the federal Endangered Species Act (ESA). These watersheds also support three species of fish that are included on the sensitive species list for Region 6 of the Forest Service. See table below. According to the Northwest Forest Plan, Tier One, Key watersheds should receive the highest priority of protection and restoration of anadromous fish habitat within any watershed restoration program.

The proposed projects have been developed through assessing primary restoration needs, off-Forest opportunities, and recommendations identified in Watershed Analysis. The projects are designed to improve fish passage that has been interrupted by road building activities, reduce sedimentation and erosion, restore riparian areas, enhance aquatic habitat, and improve water quality for fish and other aquatic species.

ESA and Sensitive species occurring on or near the Mt. Hood National Forest

Species	ESU	Status	Watershed
Bull Trout *(Salvelinus confluentus)*	Columbia River Distinct Population Segment	Threatened 5/98	Hood River
Steelhead *(Oncorhynchus mykiss)*	Lower Columbia River	Threatened 3/98	Sandy River, Clackamas River, Hood River, West Columbia Gorge Tributaries
Steelhead *(Oncorhynchus mykiss)*	Middle Columbia River	Threatened 3/99	Fifteenmile Creek, Mill Creek
Chinook *(Oncorhynchus tshawytscha)*	Lower Columbia River	Threatened 3/99	Sandy River, Hood River, West Columbia Gorge Tributaries
Chinook *(Oncorhynchus tshawytscha)*	Upper Willamette River	Threatened 3/99	Clackamas River
Coho *(Oncorhynchus kisutch)*	Lower Columbia River/Southwest WA	Candidate 7/95, Sensitive	Clackamas River, Sandy River, West Columbia Gorge Tributaries
Coastal Cutthroat Trout *(Oncorhynchus clarki)*	Southwest WA/Columbia River	Sensitive	Clackamas River, Sandy River, Hood River, Mile Creeks, Mill Creek, West Columbia Gorge Tributaries
Redband Trout *(Oncorhynchus mykiss gairdneri)*	NA	Sensitive	White River, Mill Creek, Badger-Tygh, Mile Creeks, West Fork Hood River

Lower Columbia River Steelhead (*Oncorhynchus mykiss*) Threatened (NOAA Fisheries)

Lower Columbia River steelhead occur in the Clackamas River, Sandy River, and Hood River basins. They also occur in the West Columbia Gorge tributaries. Adult winter steelhead enter rivers and streams on the Forest primarily during April through June with peak migration occurring in May. A small run of summer steelhead occurs in the Hood River. These fish enter the mainstem Hood River from June through September.

Steelhead use the majority of the mainstem rivers and tributaries as spawning and rearing habitat. Adult steelhead spawn in late winter to spring (January–June), depending in part on the run type (summer or winter steelhead), discharge and water temperature. Winter steelhead fry emerge between late June and late July and rear in freshwater habitat for one to three years. Juvenile steelhead during their first year, usually are found in riffle habitat but some of the larger juvenile steelhead will be found in pools and faster runs. Smolt emigration takes place March thru June during spring freshets.

Mid-Columbia River Steelhead (*Oncorhynchus mykiss*) Threatened (NOAA Fisheries)

Mid-Columbia steelhead occurring on the Mt. Hood National Forest is limited to the Mile Creeks and Mill Creek drainages. This stock is the easternmost run of indigenous winter steelhead trout in the Columbia River basin. Steelhead have been documented on Forest in North Fork Mill Creek, Fifteenmile Creek, Ramsey Creek, and Eightmile Creek. A barrier falls restricts steelhead from ascending Forest lands on the South Fork of Mill Creek.

Adult steelhead enter Mt. Hood watersheds during January through March and spawn in April and May, depending on flows and water temperatures. Winter steelhead fry emerge between late June and late July and rear in freshwater habitat for one to three years. Juvenile steelhead during their first year, usually are found in riffle habitat but some of the larger juvenile steelhead will be found in pools and faster runs. Smolt emigration takes place March thru June during spring freshets.

Columbia River Bull Trout (Salvelinus confluentus) Threatened (USFW)

Columbia River bull trout are presently found in the Hood River drainage. Bull trout presence has been documented in Middle Fork Hood River, Clear Branch Creek both above and below Clear Branch dam, Pinnacle Creek, Coe Branch Creek, and Eliot Branch Creek. This bull trout population is the only known population occurring on the Forest.

Bull trout populations occurring in the Middle Fork Hood River are found primarily within Laurance Lake Reservoir and adjacent Clear Branch and Pinnacle Creeks. The Clear Branch Dam has altered this subpopulation of bull trout from a fluvial to an adfluvial form. Adult fish reside in the reservoir and move into Clear Branch as early as June and spawn mainly during September, before moving back into the reservoir. It is known that a small number of individuals within the Hood River annually move into the Columbia River with some returning into the Hood River.

Bull trout were once prolific in the Clackamas River system. At present, they are believed to be extinct. There are unconfirmed reports of their presence in the Sandy River basin in the late 1950's. However, recent fish sampling conducted in both the Sandy River and Clackamas River drainages failed to uncover any bull trout presence.

Bull trout reach sexual maturity between four and seven years of age and are known to live as long as 12 years. Bull trout spawn in the fall and require clean gravel and cold-water temperatures for egg incubation. Although adults can stand water temperatures up to 8^{o} C, incubation of eggs is best with temperatures no more than 2^{o} C (36^{o} Fahrenheit).

Bull trout fry utilize side channels, stream margins, and other low velocity areas. Fluvial adults require large pools with abundant cover in rivers. Some bull trout remain residents within the area in which they hatch, while others migrate from streams to lakes or the ocean. Presumably, the various forms of bull trout interbreed, which helps to maintain viable populations throughout their range.

Lower Columbia River Chinook (*Oncorhynchus tshawytscha*) Threatened (NOAA Fisheries)

Lower Columbia River chinook salmon occur in the Sandy River, Hood River, and Clackamas River basins. They also occur in the West Columbia Gorge tributaries. These stocks are made up of both a spring run and a fall run component. The spring run occurs in the Hood River and Sandy systems, while fall run chinook are present in the Clackamas River and Sandy Rivers.

Most spring chinook salmon in the Hood River basin ascend the West Fork Hood River, and based on available information, use appears to be low in the Middle Fork Hood River. Spring

chinook in the Sandy River basin utilize the mainstem Sandy River and upper basin tributary streams such as the Salmon River, Zigzag River, Still Creek, and Clear Fork of the Sandy River. They enter these watersheds from April through August and spawn from August through early October.

The fall chinook occurring within the Sandy and Clackamas Rivers primarily spawn and rear in the mainstem and larger tributaries downstream from Forest lands.

Upper Willamette River Chinook (*Oncorhynchus tshawytscha*) Threatened (NOAA Fisheries)

Upper Willamette River spring chinook salmon occur only in the Clackamas River. The ESU consists of both naturally spawning and hatchery produced fish. These spring chinook enter the Clackamas basin from April through August and spawn from September through early October with peak spawning occurring the 3rd week in September. These fish primarily spawn and rear in the mainstem Clackamas River and larger tributaries.

Adults in the Lower Clackamas drainage spawn in Eagle Creek, below River Mill Dam and between River Mill and Faraday Diversion dams. Spawning in the upper Clackamas drainage has been observed in the mainstem Clackamas from the head of North Fork Reservoir upstream to Big Bottom, the Collawash River, Hot Springs Fork of the Collawash River, lower Fish Creek, South Fork Clackamas River and Roaring River.

Lower Columbia River/Southwest Washington Coho Salmon
(*Oncorhynchus kisutch*) Candidate for Listing (NOAA Fisheries), Sensitive (Forest Service Region 6)

The NOAA Fisheries is currently reviewing all Lower Columbia River coho stocks for possible listing under the Endangered Species Act. The Oregon Department of Fish and Wildlife has listed coho as a state threatened species. Coho are also included on the Forest Service Region 6 sensitive species list. Coho stocks occurring on the Forest are currently found in the Sandy and Clackamas River systems. They are also found in the West Columbia Gorge tributaries. The indigenous run of coho salmon in the Hood River is considered extinct. Very few coho ascend the Hood River at present and those are considered to be hatchery strays. The Clackamas River contains the last significant run of wild late-winter coho in the Columbia Basin.

Adult coho salmon enter the Sandy and Clackamas Rivers from September through February. Spawning occurs mid-January to the end of April with the peak occurring mid-February. Adults prefer deep pools and tributaries for over-wintering while juveniles will seek out inundated floodplains and other protected slow-water habitats such as side channels and slow-water pools. Woody debris and habitat diversity are important to this species.

Southwestern Washington/Columbia River Cutthroat Trout (*Oncorhynchus clarki*) Sensitive (Forest Service Region 6)

Southwest Washington/Columbia River coastal cutthroat trout occuring in waters of the Mt. Hood National Forest are composed of two native stocks: an anadromous (sea-run) form and

resident stock. Resident populations of cutthroat appear healthy in the Clackamas River, Sandy River, Hood River, and Mile Creeks basins. They are also found in the West Columbia Gorge tributaries. High numbers are usually seen by USFS personnel while conducting snorkel or electrofishing surveys.

Historically sea-run cutthroat trout occurred in the Clackamas River, Sandy River, and Hood River basins. More recently, anadromous cutthroat populations appear to have greatly declined throughout these watersheds. We do not have consistent indicators of trends in abundance for most populations of searun cutthroat trout. However, anecdotal information, creel surveys and fish counts at dams have raised concerns that anadromous populations in Oregon may be experiencing a widespread decline. The anadromous cutthroat trout is likely at a very depressed level, possibly near extinction.

Coastal cutthroat trout tend to spawn in very small (first and second order) tributaries. They spawn from December-May; alevins (24 mm) emerge from gravel during June and July. Young fry move into channel margin and backwater habitats during the first several weeks. During the winter, juvenile cutthroat trout use low velocity pools and side channels with complex habitat created by large wood. Coastal searun cutthroat juveniles rear on freshwater for 2-3 years. At 10-25 cm the smolts migrate during April and May to estuaries and marine water; reside close to shore, usually over cobble/sand beaches influenced by freshwater source (e.g. creek or stream). They usually remain close to natal estuary (within 10 km), but may range up to 70 km. Immatures and adults return to over winter in freshwater streams in fall and return to estuarine areas in spring. Adults hold in tidal pools as early as July in preparation for spawning migration as 4-5 year olds.

Redband Trout *(Oncorhynchus mykiss gairdneri)* Sensitive (Forest Service Region 6)

Redband rainbow trout occur in the White River, Mill Creek, Badger-Tygh, Mile Creeks, and Mill Creek watersheds on the Mt. Hood National Forest. Redband trout populations within the White River watershed are genetically distinct from those in the Deschutes River and are unique among other redband trout populations east of the Cascades. White River redband/inland rainbow trout are more closely related to those found in the Fort Rock Basin of central Oregon.

Like other salmonids, redband rainbow trout require adequate water quality and quantity, cover (provided by large and small wood, boulders, brush, substrate, and/or surface turbulence), invertebrate food, and various sizes and distributions of pool and riffle units. Preferred spawning substrate includes well oxygenated, loose small to medium gravels. Spawning occurs in the spring, usually in riffles or the downstream end of pools. Fry emergence from the gravel normally occurs by the middle of July, but depends on water temperature and exact time of spawning. Rearing habitat is often along stream margins, associated with instream structure provided by boulders, brush and wood. These habitats also provide cover from predation and are used for feeding lanes. Redband rainbow trout prefer water temperatures from 10-14 C, but have been found actively feeding at temperatures up to 25 C in high desert streams of Oregon and have survived in waters up to 28 C.

Effects of Projects on Aquatic Habitats

Aquatic Habitat Projects: Fish Passage, In-stream, and Riparian Restoration Projects

Many projects involve work within or adjacent to the active stream channel. They could deliver sediment, create turbidity, and cause stream bank erosion. The use of heavy mechanized equipment, such as a track hoe or walking excavator, could disturb the stream influence zone, disturb fish, and cause incidental mortality. There is also the potential of an accidental fuel/oil spill.

These projects may cause a short-term degradation of water quality due to sediment input and chemical contamination. Stream bank condition and habitat substrate may also be adversely affected in the short term. However, with careful project design and mitigation, these effects are expected to be of a limited extent and duration.

Direct effects to fish species resulting from these projects include reduced feeding efficiency during times of increased turbidity and the possibility of individual mortality during construction. Fish rely on sight to feed so feeding success could be hampered during those times turbidity is increased. This would be a short-term effect since turbid conditions would dissipate soon after an in-stream work phase was completed, generally within a few hours.

Any time there is digging or equipment used within the live stream channel there is a possibility fish could be killed or seriously injured by being crushed or run over by equipment. Based on previous experience with in-stream restoration projects, most fish vacate the area when equipment disturbs the stream channel.

Indirect effects are possible from increased amounts of fine sediment degrading aquatic habitat after project implementation is completed. Fine sediment sources include material mobilized from the stream channel during construction or erosion of exposed soil during and after project implementation. Potential impacts from increased amounts of fine sediments are degradation of spawning habitat. Wood placed in the stream channel would cause changes in channel hydraulics and may cause bank erosion and/or streambed scour. Although these processes occur naturally, the addition of large wood or changes in channel geometry as a result of restoration activities could cause localized areas of erosion until the channel reaches equilibrium at those sites.

The thinning of riparian vegetation would be a minimum of 20 feet from the stream and so there would be no substantial reduction in shade provided by riparian vegetation. Over the long term, conifers that are released as a result of the thinning would grow faster and would contribute both shade and large woody debris (when they eventually die and fall into the stream) more quickly than if they were allowed to grow in the current riparian stands of vegetation.

The amount of sediment generated from these projects is expected to be low due to the time of year when the projects are implemented and the use of best management practices. Once exposed soil areas are re-vegetated and stabilized, erosion would be negligible. Affected areas would be localized and probably extend no further than several hundred feet downstream from

the project site. The effects would be relatively short-term; as flows in the winter increase, any sediment caused by project activity would be redistributed downstream and in effect diluted as material settles in different areas.

The probability of "take" of threatened or proposed species resulting from the implementation of these types of projects is low, but present regardless. Following in-stream work guidelines, project design criteria, using aggressive erosion control measures, and adherence to applicable Best Management Practices (BMP's) effects would be negligible at the watershed scale.

These projects are expected to provide long-term ecological benefits, such as restoring habitat connectivity to all life histories of fish and aquatic species, restoring fish passage to historical habitats, reducing erosion and sedimentation, restoring riparian vegetation and natural processes, improving nutrient levels and improving spawning and rearing habitat for all fish species.

Road Related Projects: Repair & Decommissioning

One of the most important aquatic components of watershed restoration is control and prevention of road-related runoff and sediment production. Road related projects include repair, decommissioning, and storm-proofing. These projects involve work within the existing road prism. Thus, the potential exists to deliver sediment to streams and create turbidity, particularly where roadwork happens close to streams.

These activities may cause a short-term degradation of water quality and aquatic habitat due to sediment inputs. Potential direct effects to fish species resulting from implementing road projects are increased turbidity levels which may reduce feeding efficiency. This is likely to only occur in the vicinity of stream crossings where project work may directly impact stream habitat, as in the case of culvert removal during road decommissioning. In the long-term, these projects would restore aquatic habitat by reducing sediment delivery to streams and improving fish passage by removing culverts where roads are obliterated. Indirect effects are possible from increased delivery of fine sediment from erosion of exposed soil during and after project implementation.

Road decommissioning projects would also tend to restore hydrology by reducing peak flows (reducing the amount of non-permeable surface thus reducing run-off) and reducing drainage network. Watershed conditions would also be improved as road densities are reduced and riparian reserves are restored. These projects may also potentially improve floodplain connectivity where culverts are removed and where roads parallel stream channels along the valley bottom.

The proposed projects would result in improved long-term water quality. Areas of chronic sediment supply would be stabilized and re-vegetated. Road-related watershed restoration treatments proposed in this document would hasten the recovery of watershed health and long-term water quality conditions. Long-term beneficial effects result from restoration of hydrologic functions, reduced risk of washouts and landslides, and reduction of sediment delivery to streams.

Quarry Rehabilitation

The rehabilitation of a quarry sites would include adding fill material where needed, recontouring, and revegetation. Activities associated with rock quarry operations have the potential to cause short-term degradation of water quality and aquatic habitat due to sediment input caused by hauling materials to and from the site.

The quarries proposed for rehabilitation are within Riparian Reserves thus they presently pose a potential risk to water quality. Rehabilitation of these sites would have a long-term beneficial effect on water quality and aquatic habitat.

Fencing Projects

Fencing projects are required to control livestock use levels in and around wet meadows and riparian areas. No disturbance would occur close to stream channels. Control of livestock utilization levels is needed, where there are no present barriers to animal movement in and out of meadow and riparian ecosystems.

Expected benefits to fish and water quality: The expected benefits to fish are habitat enhancement by controlling trampling/consumption of vegetation and stream bank damage by livestock. The benefits to water quality would be the reduction and/or elimination of both non-point and point source pollutants.

Ditch Piping Projects

Ditch piping projects involve converting existing irrigation ditches to pipes in order to transport water more efficiently and installing screens to exclude fish from entering the irrigation systems. Project work would occur within the existing ditch path, when the ditches are dry. Any ground disturbance during project implementation would deliver minor amounts of sediment to adjacent stream courses because of the project would be implemented during the dry season. Piping would have a long-term beneficial effect on fish and water quality by reducing the amount of sediment entering stream channels, allowing the saved water to remain in streams and eliminating entrainment of fish into the irrigation system.

Vegetation Management and Wildlife Projects

Vegetation management projects involve using hand loppers to remove small conifers from oak stands. These projects are not located near any streams and would have an insignificant impact on fish or fish habitat. Wildlife projects involve girdling or blasting trees to create snags. The projects located outside of riparian reserves would not have an effect on fish or fish habitat, and the projects located near streams would have a beneficial effect on fish habitat when snags that are created eventually are recruited into streams as large woody debris.

Effects Determination for Threatened or Proposed Fish and Essential Fish Habitat – Alternative 2

Project Types	Determination
Fish Passage/ Culverts, Quarry Rehabilitation, In-stream/ Riparian	**May Affect and are Likely to Adversely Affect (LAA)** threatened and proposed species found within the project areas due to the probability of take, both in terms of mortality and harassment. **May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (MIIH)** of fish listed as sensitive that are found within the project areas. **May Not Adversely Affect** Essential Fish Habitat due to disturbance within the stream channel. The effects to EFH would be short-term and limited to site-specific areas where project work takes place. These projects would have a beneficial effect on EFH in the long-term. (Except projects that are outside of the historic range of Coho, Chum and Chinook Salmon, see Biological Evaluation.)
Road Repair, Road Decommission, Wildlife, Ditch Piping	**May Affect, Not Likely to Adversely Affect (NLAA)** determination for threatened and proposed fish species. **May Impact Individuals or Habitat, but will not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species (MIIH)** of fish listed as sensitive that are found within the project areas. **May Not Adversely Affect** Essential Fish Habitat. These projects are not anticipated to contribute sediment to streams and therefore would not affect EFH.
Fencing, Vegetation Management	**No Effect** to any threatened or proposed fish species. **No Impact (NI)** on any sensitive fish species. **May Not Adversely Affect** Essential Fish Habitat.

Essential Fish Habitat Consultation

The Sustainable Fisheries Act of 1996 amended the Magnuson-Stevens Fishery Conservation and Management Act (MSA) to establish new requirements for Essential Fish Habitat (EFH) descriptions in federal fishery management plans and to require Federal action agencies to consult with NOAA Fisheries regarding any action or proposed action authorized, funded, or undertaken by the agency that may adversely affect essential fish habitat (EFH) identified under the MSA.

Essential Fish Habitat means those "waters and substrate necessary to fish for spawning,

breeding, feeding, or growth to maturity." EFH includes those waters and substrate necessary to ensure the production needed to support a long-term sustainable fishery (i.e., properly functioning habitat conditions necessary for the long-term survival of the species through the full range of environmental variation). EFH includes all streams, lakes, ponds, wetlands, and other water bodies currently, or historically, accessible to salmon in Washington, Oregon, Idaho, and California.

Three salmonid species are identified under the MSA: chinook salmon, coho salmon and Puget Sound pink salmon. Chinook and coho salmon occur on the Forest in the Clackamas River, Hood River, and Sandy River basins therefore, EFH consultation is necessary for agency actions within these watersheds. Although no chinook or coho salmon occur in the Mile Creeks or Mill Creek basins they lie within the EFH boundary. As stated above in the Effects Determination table, the proposed projects may not adversely affect EFH that occurs in the project areas.

Recreational Fishing

The proposed projects would improve recreational fishing opportunities by restoring fish habitat conditions. Road decommissioning may increase walk-in distances for some anglers.

Water Quality

Fish Passage Projects

In general, culvert removal projects would result in short-term input of sediment (immediately and up to 1 to 2 years after project completion) downstream from the project site. Since all of these pipes are on fish-bearing streams, some sediment would be delivered to areas of existing fish habitat. Mitigation measures that are focused on reducing sediment production include operating in the low-water season, isolating the work site from exposure to water, and revegetating disturbed areas after completion of work. These measures would minimize the amount of sediment entering surface water.

These projects would not only benefit fish movement, they would decrease aquatic habitat fragmentation. Larger culverts or bridges would allow wood, water and sediment to move more naturally through these crossing sites.

Fencing Projects

No measurable amounts of sediment are expected to be delivered to adjacent streams from fence construction. A net decrease in sediment production and delivery would result due to elimination of streambank trampling from livestock use. This reduction would be greatest in high use areas that have steep banks composed of fine material. Additional indirect benefits to bank stability and resulting sediment delivery would be derived from riparian vegetation recovery due to livestock exclusion. Recovery of the riparian area would increase bank stability due to increased root cohesion.

Ditch Piping Projects

The majority of the impact for these projects is expected to take place within the existing area of disturbance. Work would most likely take place during periods of non-irrigation so there would be no interruption of flow to users. Since most of the work would take place when the ditches are dry, it is not expected that sediment would be introduced to surface flow via these ditches. Piping would have a considerable benefit to water quality by isolating surface water from herbicides, pesticides, and sediment. Piping would also reduce loss of water from evaporation, which should translate into a more efficient conveyance system. A more efficient conveyance system may lead to a reduced need to divert flow from existing rivers and reservoirs keeping more water in these features.

Quarry Rehabilitation Projects

Runoff from quarries can be a source of sediment to surrounding surface water. In some cases, excavation during quarry development can intercept subsurface flow and route it through spoil piles or other unconsolidated material, creating a sediment source. In other cases, these areas can collect snowmelt or rainfall and focus runoff through unconsolidated material and into surface water.

Quarry rehabilitation is not expected to introduce sediment due to implementation of mitigation measures such as working during the dry period of the year and employing erosion control measures. Several beneficial effects are expected to result from this project type. These include a reduction of sediment through controlling runoff and revegetation, and increase of riparian area function in riparian area quarries. Revegetation with trees should increase stream shading, potential large woody material and bank stability over the long term.

Road Repair

Road repair projects include a variety of different types. The majority of these projects propose to upgrade culverts to accommodate larger flood events or replace flood-damaged bridges. Effects from these type of projects would be similar to those described for installation of fish passage culverts. Increasing culvert size would decrease aquatic habitat fragmentation. Larger culverts would allow wood, water and sediment to move more naturally through these crossing sites.

Road Decommissioning

In general, culvert removal during road decommissioning would result in short term input of sediment (immediately and up to 1 to 2 years after project completion) downstream from the project site. Mitigation measures that are focused on reducing sediment production include operating in the low-water window, isolating the work site from exposure to water, and revegetating disturbed areas after completion of work. These measures would minimize the amount of sediment entering surface water.

Ripping of the road surface would help restore infiltration and resulting movement of water

vertically through the soil profile. This in turn, should help restore flow quantity and timing and basin hydrology. Erosion and resulting sedimentation originating from these roads would also be reduced significantly due to revegetation and restoration of more natural water flow patterns.

In-stream Projects

Ground disturbing activities either nearby or within stream channels would likely result in localized short-term increases in turbidity. Most of this sediment is associated with equipment access roads and bank or channel excavation. Increases in turbidity would be of low intensity and short-lived from access roads. Turbidity from channel excavation for wood placement or other aquatic projects can be quite high during equipment operation. Mitigation measures such as timing of operations, use of drainage diversions, sediment filters and timely erosion control applications would reduce the magnitude of short-term water quality effects.

In the long term, these projects would lead to a more natural aquatic environment due to increased channel complexity. This increased channel complexity would restore a more natural flow of wood, water and sediment through these reaches, which would lead to improved aquatic and riparian area function.

Fertilizers are applied as a part of erosion control efforts for many of the above project types. Raw soils that are exposed during project implementation are seeded and mulched to establish grasses and other plants that protect soils and hold them in place. There is the potential for fertilizer application to contribute nutrients into streams. Effects would be minimized by mitigation measures have been included to prevent runoff of fertilizer into streams.

Vegetation Management and Wildlife Habitat

The wildlife and vegetation management projects would not affect water quality because they are in upland areas and there would be minimal ground disturbance.

Soils/Geology

Construction projects that involve heavy equipment have the potential to disturb soils and hillslopes and, in the short term, generate sediment that could reach a stream. Sediment can be delivered to streams through surface erosion and mass wasting (landslides). Surface erosion and landslides affect water quality and fish habitat and reduce site productivity at the sediment source. Surface erosion and landslides may also destabilize adjacent slopes. The restoration projects proposed here would help heal disturbed areas that are prone to surface erosion or landsliding, or prevent potential chronic sediment sources from developing.

Fish Passage Projects

Naturally occurring channelized debris flows are likely to occur in some streams during large

flood events. These debris flows transport large boulders and large woody debris that are deposited in lower gradient stream reaches where they enhance fish habitat. Crossings that are removed or upgraded and designed to pass a large storm event are much less likely to fail. They would be more likely to allow a flood or debris flow to pass over or through the crossing, allowing those natural processes to proceed uninterrupted.

Fencing

Cattle would be kept out of sensitive areas and natural vegetation would be encouraged to recolonize these areas. This **would** reduce surface erosion and risk of streambank collapse.

Ditch Piping

Ditch water would be diverted into pipes, eliminating ground seepage and the potential for surface erosion and landsliding.

Quarry Rehabilitation

All three of these quarries are within the Colombia River Gorge National Scenic Area and have been closed to public and agency use since its creation in 1986. Rehabilitating these quarries would further ensure that they would no longer serve as a source for rock material. Other rock quarries can supply the rock material needs in these areas. Recontouring, spreading soil, and planting would begin the process of establishing more natural drainage patterns and vegetation. This would reduce the amount of exposed ground at the former quarry sites and reduce the amount of soil eroding from these sites.

Road Repair

Repairing or storm proofing needed roads would greatly reduce the volume of delivered sediment from road related surface erosion and road-induced landslides.

Road Decommissioning

Decommissioning unneeded roads that can no longer be maintained properly would greatly reduce the volume of delivered sediment from road related surface erosion and road-induced landslides.

Decommissioning roads also reduces public access to parts of the Forest. There are several mining claims currently accessed by Road 1820. These mining claims are behind a locked gate that was installed in 1997. The claimants walk or use motorbikes on the gated-off 1.87-mile segment of Road 1820 to reach their mining claims. Activity at the mining claims is presently limited to prospecting. Decommissioning Road 1820 (RD-8) would increase the difficulty of access for the claimants.

In-stream

The placement of large woody debris and large boulders in the channel and various bank

stabilization projects would restore stream velocities to their natural range and reduce the amount of bank erosion.

Vegetation Management and Wildlife Habitat

Encouraging the growth of desired plant species would increase the root strength and other soil-protective qualities of vegetation and increase the erosion resistance of the area.

Wildlife

Effects of Alternative 1 (No Action)

The no action alternative would not harm Federally listed species or sensitive species. Since the projects involving road decommissioning would not be implemented there would be continued harassment of deer and elk. No snags or down logs would be created and the species that rely on these habitat components would decline in numbers.

Effects of Alternative 2 (Proposed Action)

Federally Listed Species

Northern Spotted Owl (threatened) – In Oregon spotted owls successfully breed mainly in late-successional mixed conifer forests, usually dominated by Douglas-fir. The species prefers larger forest stands (more than 1,200 acres) with multiple layers and a closed canopy. The owls' main food items are flying squirrels, red tree voles, western red-backed voles, and dusky-footed woodrats.

The proposed projects do not involve any modification of northern spotted owl habitat. The primary impact would be disturbance due to the noise of equipment. March 1st through July 15th is the critical breeding period. A seasonal restriction is customary during this time period to reduce noise. However there are several conditions that could eliminate the need for a seasonal restriction and would result in a "no effect" determination for northern spotted owls: 1) If a project is greater than ¼ mile from suitable habitat; 2) If the area around a project is surveyed and found to be greater than ¼ mile from any activity centers; or 3) if the project does not generate noise above the ambient noise level.

No equipment would be operated between March 1st and July 15th for all projects except: C-1, Q-3, IR-1, IR-7, IR-8, IR-9, IR-10, IR-11, and IR-15. Because of other seasonal restrictions and weather, it is presumed that most projects would be implemented between July 16th and September 30th (during the second part of the breeding season when young owls are being cared for at the nest). These projects would have an effects determination of "may effect, not likely to adversely affect (NLAA)."

Consultation with U.S. Fish and Wildlife Service would not be necessary for any of the restoration projects, since those projects found to be NLAA are covered via a programmatic biological opinion.

Bald Eagle (threatened) – Bald eagles require large trees and snags for nesting and roosting, and large bodies of water such as lakes and major rivers for foraging.

No known eagle nests occur within the vicinity of any of the proposed projects. No habitat modification to any potential eagle nesting or foraging habitat would occur. Since there are no known nests nearby, no disturbance effects to the species is expected with implementation of any of the proposed projects.

A determination of "no effect" has been made for these projects.

Canada Lynx (threatened) – The Forest has made the determination, based on best available scientific and commercial data, that the Canada lynx and its habitat are currently not present on the Forest and therefore no effects are expected from management activities, including these proposed projects.

Sensitive Species

The following species have an effects determination of **"No Impact":**

The **horned grebe** favors areas with much open water surrounded with emergent vegetation. The **gray flycatcher** prefers relatively treeless areas with tall sagebrush, bitterbrush, or mountain mahogany communities, but would also occupy these communities within open forest of ponderosa or lodgepole pine. No habitat exists for horned grebe and gray flycatcher in the project areas.

The following species have an effects determination of **"May impact individuals but is not likely to cause a trend toward federal listing or loss of viability:"**

Bufflehead: This species nests near mountain lakes surrounded by open woodlands containing snags. Habitat exists for this species within a few of the riparian/in-stream projects.

Seasonal restrictions for in-stream work (mitigation #2) would also protect these species during most of its breeding season (May – August). However, there is still a slight potential of impact to adult and juvenile individuals.

Harlequin Duck: This species breeds along relatively low-gradient, slower-flowing reaches of mountain streams in forested areas. Habitat exists for this species near several of the projects including culvert replacement, in-stream, road decommissioning and ditch piping projects.

Harlequin ducks are known to be sensitive to disturbance. The projects involving road decommissioning would reduce open road densities near potential harlequin duck habitat. This would improve the quality of the habitat for this species at these locations. Seasonal restrictions for in-stream work (mitigation #2) would also protect these ducks for a majority of the breeding period (April – August). However, there is still a slight potential of impact to adult and juvenile individuals.

American Peregrine Falcon: The most critical habitat components for this species are suitable nest sites, usually cliffs, over-looking open areas with an ample food supply.

Implementation of projects would not negatively affect any potential or known habitat for this species.

Peregrine falcons are known to be sensitive to disturbance.

California Wolverine: In Oregon, the wolverine typically is found in mature, open and closed-canopy forests at higher elevations and in alpine areas. Wolverines are known to be sensitive to disturbance.

Implementation of projects in potential wolverine habitat would not negatively affect the quality of the habitat being provided for the species.

The projects involving road decommissioning would reduce road densities near potential wolverine habitat. This would improve the quality of the habitat for this species at these locations. However, there is the slight possibility that a wolverine traveling through the area could be impacted by the disturbance associated with implementation of the action alternative.

Baird's shrew is found in cool, moist areas, usually within coniferous or deciduous forests. Baird's shrew often takes refuge in mossy banks of small streams, or in downed logs and woody debris or ground litter. These species have potential habitat in the vicinity of the fencing projects, and at access points for in-stream/riparian projects. However, ground disturbance associated with fencing projects or in-stream/riparian would be minimal.

The **Pacific fringe-tailed bat** is found in a wide variety of habitats throughout its range, but it seems to prefer forested or riparian areas, and can use large trees, logs, and caves for roosting.

Pacific fisher primarily use mature, closed-canopy coniferous forests with some deciduous component, frequently along riparian corridors. Disturbance could occur to individuals through disturbance to roosts or den sites, but is unlikely since large trees and Large Woody Debris would remain intact. Noise from equipment is the primary concern for these species. Implementation of projects would not negatively affect any potential habitat for the Pacific fringe-tailed bat and Pacific fisher. Noise and associated activity created by project implementation is not predicted to be at a high enough magnitude or scale to disturb individuals or the population.

Other Sensitive Species:

It is expected, based on previous experience with similar project types, that there would be little or no impact to the sensitive species listed below. There is the potential for minor impacts from the disturbance of equipment to species that have potential habitat near projects. The projects may impact individuals of sensitive species but they are not likely to cause a trend toward federal listing or loss of viability. Surveys would be conducted for projects with potential habitat during the appropriate season for species identification. It is expected, based on

previous experience that if species are found the project would still take place with minor alterations where feasible to avoid impacting the species.

Oregon spotted frog is frequently found in waters and associated vegetated shorelines of ponds, springs, marches, and slow-flowing streams. **Oregon slender salamander** is found under bark or moss in mature and second-growth Douglas-fir forests, as well as under rocks or logs in stands of moist hardwood forests within coniferous forests landscapes. The **Larch Mountain salamander** is generally found in talus slopes within areas of Douglas-fir forests, although the species may also be found in general forested areas. **Cope's giant salamander** is found in moist forested areas in clear, cold streams, brooks, and ponds with gravel bottoms and boulders. **Cascade torrent salamander** is most abundant in rocks bathed in a constant flow of cold water, also occurring in cool rocky streams, lakes, and seeps. Habitat exists for this species near several of the projects including culvert replacement, in-stream, road decommissioning and ditch piping projects. **Painted turtle** is found in shallow, quiet waters with a muddy or sandy substrate. They live in lakes, ponds, marches, and small streams. The **Northwestern pond turtle** prefers quiet water in small lakes, marshes, and sluggish streams and rivers. Habitat exists for these species within the ditch piping and some of the riparian/in-stream projects.

Seasonal restrictions for in-stream work (mitigation #2) would protect these species for a majority of the breeding period. However, there is still a slight potential of impact to adult and juvenile individuals. Long-term effects would be beneficial due to reduction of sedimentation. Work in conjunction with the ditch piping projects would occur after they have been drained. Although the ditches would not be providing habitat for these species during project implementation, the result of implementation would be the removal of some human created habitat.

Deer and Elk (Indicator Species): The west side of the Forest has black-tail deer and Roosevelt elk. On the east side, mule deer and rocky mountain elk predominate. Deer and elk are known to be sensitive to disturbance and high open road densities reduce habitat quality.

The projects involving road decommissioning would reduce harassment of deer and elk. Erosion control seed placed on decommissioned roads, erosion control projects and quarries would improve the quantity and quality of forage.

There are proposed projects within certain special winter range areas that have the potential to disturb deer and elk if they were implemented during the critical winter months (December 1st – March 31st). Mitigation #3 provides a seasonal restriction to avoid this impact. There are areas where animals have grown accustomed to ambient noise levels such as near highways or residential areas. Projects in these areas would be exempt from seasonal restrictions where a biologist has determined that the intensity of noise is within the range of ambient noise, and therefore would not cause alarm or increase stress to animals there. The winter range restriction would apply to projects C7a, C7b, C-8, C-9, C-16, C-25, C-26, C-29, C-37 through C45, F-2, Q-1, RR-3, RD-3, IR-6, IR-8, IR-12, IR-13, IR-15 and W-2.

Survey and Manage Species

The Northwest Forest Plan as amended, identifies survey and manage species. Each year beginning in 2001, the Survey and Manage Annual Species Review changed the status of species and removed some from the list.

The wildlife species that are known or suspected to fall within the project areas are the red tree vole (*Arborimus longicaudus*), Larch Mountain salamander (*Plethodon larselli*), and various mollusk species (*Lyogyrus, Juga, Deroceras hesperium, Hemphillia glandulosa, Hemphillia burringtoni, Hemphillia pantherina, Pristiloma articum crateris, Cryptomastix devia, Cryptomastix hendersoni, Monadenia fidelis minor, and Megomphix hemphilli*).

Known sites of these species would not be negatively affected by the proposed action due to the distance from projects and due to the minor levels of habitat disturbance. The Survey and Manage Standards and Guidelines (page 22) define when pre-disturbance surveys are needed.

It is expected, based on previous experience with similar project types, that there would be little or no impact to survey and manage species. There is the potential for minor impacts from the disturbance of equipment to species that have potential habitat near projects. The projects may impact individuals but they are not likely to affect species persistence at the project site. Surveys would be conducted for projects with potential habitat during the appropriate season for species identification. It is expected, based on previous experience that if survey and manage species are found the project would still take place with minor alterations where feasible to avoid impacting the species.

Red tree voles would not be impacted since no projects cut trees in Douglas-fir late-seral stands.

It is expected, based on previous experience that the aquatic mollusk species *Lyogyrus* will be found in many of the streams near projects. Management Recommendations indicate that the proposed restoration projects would be acceptable since they would enhance habitat, decrease sediment input, and improve dispersal capabilities for these species. Project implementation would not increase water temperatures or introduce high levels of sedimentation, nor reduce dissolved oxygen levels necessary to sustain viable populations of *Lyogyrus*. Adherence to mitigation measures such as erosion control, site specific Spill Prevention Control and Countermeasure Plans, and timing of in-stream work when flows are low, would provide protection for this species.

Fish Passage/Culverts: Disturbance for these projects would be primarily within the stream channel and within the road prism. These areas are not considered habitat for any of the wildlife survey and manage species. There may be minor ground disturbance associated with excavators or other equipment that move off the road prism to facilitate culvert removal or replacement. This disturbance would involve minor amounts of new disturbance in potential habitat for survey and manage species. Disturbance would be very minimal and would not likely have a significant negative impact on the species' habitat, its life cycle, microclimate, or life support requirements.

Fencing: There would be no affect because fences involve above ground construction with no postholes and would not disturb habitat for any wildlife survey and manage species.

Ditch Piping: Ground disturbance for both ditch-piping projects would occur primarily within the existing ditches and associated access routes. These ditches and the immediate surrounding area are considered previously disturbed sites. There may be minor amounts of new ground disturbance associated with excavators or other equipment that move off the ditch and access routes to facilitate pipe placement and backfilling. This disturbance would involve minor amounts of new disturbance in potential habitat for survey and manage species. Disturbance would be very minimal and would not likely have a significant negative impact on the species' habitat, its life cycle, microclimate, or life support requirements.

Quarry Rehabilitation: All ground disturbance associated with projects would occur within the existing quarries. These quarries are intensively disturbed sites and do not contain habitat for any wildlife species.

In-stream/Riparian: Stream channels are considered non-habitat for terrestrial wildlife species. Some projects such as those that use only helicopters or handwork would result in no habitat disturbance. Other projects involve minor ground disturbance associated with excavators that move from an adjacent road to the stream to accomplish the needed work. For some projects, such as side channel maintenance, this disturbance would occur within previously disturbed sites but there are other projects that would involve minor amounts of new disturbance in potential habitat for survey and manage species. Disturbance would be very minimal and would not likely have a significant negative impact on the species' habitat, its life cycle, microclimate, or life support requirements. Due to seasonal restrictions to project fish and water quality, these projects would be implemented during the dry season when many of the terrestrial species are underground.

Road Repair and Road Decommissioning: Ground-disturbance would occur within the road prism, where wildlife habitat is not present.

Vegetation Management and Wildlife Habitat: These projects involve the use of hand loppers to remove small conifers from oak stands, and the girdling or blasting of trees to create snags. These projects would not have a negative effect on wildlife.

Botany

Threatened, Endangered, and Regional Forester's Sensitive Plants

All project sites were reviewed to determine their potential for Endangered, Threatened and Sensitive species habitat. Sites associated with disturbed areas, such as roads and quarries, are not potential habitat. Project sites with potential habitat for species are associated with undisturbed areas such as the riparian areas associated with streams.

The combined list of the Mt. Hood National Forest and the Columbia Gorge National Scenic Area Threatened, Endangered, and Sensitive (TES) plants includes approximately 83 species. Many of these species do not occur near projects or in habitats that would be altered by the

projects but other species do have potential habitat near projects. These 83 species are sensitive species, and one of them is a candidate for threatened status. The candidate species is *Howellia aquatilis*; a species that lives in ponds and lakes. Pond and lake habitats would not be affected by the proposed action. No other threatened or endangered botanical species occur in the analysis area. A biological evaluation contains the list of species and an evaluation of project sites to determine if there is potential habitat.

It is expected, based on previous experience with similar project types, that there would be little or no impact to threatened, endangered or sensitive species. There is the potential for minor impacts from the disturbance of equipment to species that have potential habitat near projects. The projects may impact individuals of sensitive species but they are not likely to cause a trend toward federal listing or loss of viability. Surveys would be conducted for projects with potential habitat during the appropriate season for species identification. It is expected, based on previous experience that if species are found the project would still take place with minor alterations where feasible to avoid impacting the species.

Survey and Manage Species

Each year beginning in 2001, the Survey and Manage Annual Species Review changed the status of species and removed some from the list. A search of the Interagency Species Management System database (ISMS) for Category A, B, C, D or E species, found some known sites near projects, but not close enough to be impacted by project implementation. The direction for Category A, B and E species is to "Manage All Known Sites." Category C and D species direction is to "Manage High Priority Sites."

Botanists determined if there was habitat for any Survey and Manage botanical species requiring pre-disturbance surveys. If potential habitat for any of these species was judged to be present and if the project activity would potentially affect the species, a field survey would be conducted. Species requiring pre-disturbance surveys with potential habitat near projects:

Species	**Group**	**Category**
Schistostega pennata	Bryophyte	A
Tetraphis geniculata	Bryophyte	A
Bridgeoporus nobilissimus	Fungi	A
Bryoria pseudocapillaris	Lichen	A
Hypogymnia duplicata	Lichen	A
Leptogium cyanescens	Lichen	A
Lobaria linita	Lichen	A
Nephroma occultum	Lichen	A
Pseudocyphellaria rainierensis	Lichen	A
Ramalina thrausta	Lichen	A
Botrychium minganense	Vascular plant	A
Botrychium montanum	Vascular plant	A
Coptis trifolia	Vascular plant	A
Corydalis aquae-gelidae	Vascular plant	A
Cyprepedium montanum	Vascular plant	C
Galium kamtschaticum	Vascular plant	A

It is expected, based on previous experience with similar project types, that there would be little or no impact to survey and manage species. There is the potential for minor impacts from the disturbance of equipment to species that have potential habitat near projects. The projects may impact individuals but they are not likely to affect species persistence. Surveys would be conducted for projects with potential habitat during the appropriate season for species identification. It is expected, based on previous experience that if survey and manage species are found the project would still take place with minor alterations where feasible to avoid impacting the species.

The no-action alternative would not impact botanical species.

Other Resources

Recreation

Some kinds of recreationists may be negatively affected by projects that decommission roads or that limit vehicle use. Those that rely on vehicle access such as harvesting of special forest products or people going for a drive in the woods might be most negatively affected. Decommissioning may actually enhance opportunities for those looking for solitude or a quality hunting experience. Approximately 14 miles of roads would be decommissioned. Forest users would continue to have access to many roads and the landscapes and resources that are accessed. However, there may be certain individuals that frequent roads proposed for decommissioning that would be displaced to somewhere else.

Recreationists may be positively affected by projects that improve fisheries and recreational fishing both on-Forest and off. Recreationists may also benefit from projects that repair roads. Some of the roads have slumps or cracks that make driving slow or even dangerous. Alternative 1 would not have these enhancements.

Impacts of in-stream structures to white water river users would be minimized by placing logs so that they do not cross the entire channel.

Transportation – Roads Analysis

The recently established Roads Analysis rule requires that decisions about road management be informed by a roads analysis. The proposed action includes many project types that involve roads including fish passage projects, quarry rehabilitation projects, road repair and road decommissioning.

A formal Roads Analysis is currently being developed at the Forest level. In the interim, road management decisions would be informed by project-level analysis. The proposed actions were carefully designed to include projects that were urgent and where the need for restoration to benefit wildlife, fish and water quality is clear. Other potential projects with less concern were deferred until the Forest-level analysis could be completed.

This project-level roads analysis tiers to efforts already completed. Watershed Analysis began this process and it was further developed by the Forest-level Access and Travel Management

Plan that was completed in 1999. This proposal is consistent with the ATM plan. All roads proposed for decommissioning are either closed or their objective maintenance level is 1.

Even though many of the project types deal with roads, the following summary of the roads analysis will focus on the roads proposed for decommissioning. The list of potential roads to decommissioned was confirmed through the Access and Travel Management Plan and the roads were examined individually (by local land managers with the greatest knowledge of the road and resources affected) to ensure that the roads with the greatest urgency were included. The analysis file contains the rationale and specific circumstances for individual roads.

Roads require regular inspection and maintenance to keep them drivable, and to prevent resource damage. Funding for road maintenance is lower than the level needed to properly maintain the approximate 3000 miles of open roads on the Forest. The Access and Travel Management Plan of 1999 identified the need to eventually close approximately half of the current road system.

The process of decommissioning roads varies based on site-specific need. Culverts would be removed if present. If quality aggregate is present it would be removed to give vegetation a better chance to take root. The aggregate would be recycled by stockpiling it for use on another road. If unstable fill slopes are present, this material would be pulled back to prevent future landsliding. Deep scarification of road surfaces would be followed by seeding for erosion control. Berms or boulders would block vehicular access. The cost of decommissioning would be about $6,000 per mile plus an additional $9,000 per mile to remove aggregate where present. The cost of aggregate removal would eventually be offset by savings when the aggregate is reused.

The road repairs proposed would enhance public safety. These roads are designated in the Access and Travel Management Plan as being needed for long-term forest access. The needs vary by road but usually involve deep patch repairs of sinking and cracking pavement and repaving. This work can cost $200,000 per mile or more.

Costs and Benefits

Each project is designed with cost effectiveness as a primary objective so that the limited funding available for restoration can be efficiently used to achieve the greatest benefit.

In addition to the resource benefits described elsewhere, there are considerable economic values gained by society when wildlife and fish habitats and water quality are restored.

- Commercial and recreational fishing may be enhanced as fish runs are restored.
- Municipal water providers that filter might see cost savings as water quality improves.
- Irrigators would spend less repairing and maintaining ditches.
- The Forest would spend less for road maintenance on decommissioned roads.
- The Forest would spend less for flood repairs when culverts are redesigned.

Funding is not secured for most of these projects. Since the cost is greater than the budget

traditionally allocated to the Forest and the benefits are widespread, many of the projects would be funded by non-traditional sources. Efforts are ongoing to find partnerships with other public and private agencies to provide funding, equipment, labor, or design expertise. Efficiencies in planning have been gained by combining all of these projects into a unified document as compared to separate documentation for each project. The cost and skills needed to prepare documentation and the associated survey, analysis, and design phases would have been an impediment for projects with limited funding.

Grazing

The grazing of livestock occurs on portions of the Forest. The fencing projects would direct livestock away from sensitive riparian areas. This protects these areas from trampling while redistributing livestock to more appropriate areas. This action does not significantly reduce the quantity of forage available for livestock.

Wild and Scenic Rivers

Many projects are within the various Wild and Scenic River management areas. Each river has a list of Outstandingly Remarkable Values (ORVs) that include fish and scenery among others. These are the features of the rivers that make them special. All of these projects protect or enhance the ORVs for these rivers: the fisheries and water quality components would be improved, and the other ORVs would remain unaltered.

Heritage Resources

The National Historic Preservation Act and the National Environmental Protection Act both require consideration be given to the potential effect of federal undertakings on historic resources, (including historic and prehistoric cultural resource sites). The guidelines for assessing effects and for consultation are provided in 36 CFR 800. To implement these guidelines, in 1995, Region 6 of the Forest Service entered an agreement with the Oregon State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP). In accordance with this agreement, the proposed activities were considered on a case-by-case basis and separated into one of two categories: 1) Activities considered to have little or no potential to affect historic properties and are excluded from review; and 2) Activities requiring a survey.

It is expected, based on previous experience with similar project types, that there would be little or no impact to heritage resources. There is the potential for minor impacts from the disturbance of equipment. Surveys have been conducted except where snow levels prohibited visual inspection of the ground. Additional surveys would be completed as snow melts. It is expected, based on previous experience that if sites are found the project would still take place with minor alterations where feasible to avoid impacting sites.

Air Quality

Implementation of proposed projects would have little or no effect on air quality since no burning is proposed. There would be some minor short-term impacts from dust and exhaust from equipment during project implementation.

Competing and Unwanted Vegetation (Invasive Plants & Noxious Weeds)

Invasive Plants are any plant species not native to a particular ecosystem that are likely to cause environmental harm, or harm to human health. They include, but are not limited to, the Oregon Department of Agriculture (ODA) Noxious Weed list. Noxious weeds are nuisance species that are targeted for control by the Oregon State Department of Agriculture (ODA). In the 1998 Final EIS for Managing Competing and Unwanted Vegetation, the Forest Service established that coordinated efforts for noxious weed control are necessary to prevent adverse effects on the environment. Invasive non-native plant species are not classified as "noxious" by the ODA but are a threat to biodiversity. Refer to the Executive Order regarding Invasive Species (2/3/99, sections 2 and 3) and Forest Standards and Guidelines FW-148 and FW-162. Invasive Plants may disrupt natural ecosystems by displacing native species and reducing natural diversity through the replacement of native communities with invasive monotypic weed stands. They reduce productivity of forest systems by displacing desirable species and capturing and utilizing valuable resources (Oregon Weed Control Program 2002).

It is expected, based on previous experience with similar project types and based on the prevention practices, that there would be little or no spread of noxious weeds. It is known that some invasive plants and noxious weeds occur near projects. Additional surveys would be conducted for projects during the appropriate season for species identification. It is expected, based on previous experience that if invasive plants or noxious weeds are found, the project would still take place with minor alterations where feasible.

Mitigation measure #7 would prevent the spread of invasive plants or noxious weeds and would be applied to all projects. This includes actions such as the cleaning of equipment and using certified seed for erosion control. A Noxious Weed Risk Assessment includes additional site specific guidance for each project.

Environmental Justice - Civil Rights

Executive Order 12898 directs agencies to identify and address disproportionately high and adverse human health or environmental effects of projects on certain populations. This includes Asian Americans, African Americans, Hispanics, American Indians, low-income populations and subsistence uses. The Civil Rights Act of 1964 prohibits discrimination in program delivery and employment. Restoration project cover the entire Mt. Hood National Forest and the Columbia Gorge National Scenic Area as well as some private lands and may affect many disconnected communities on the north, east and west sides of the Forest.

Potentially Affected Communities- There are communities with minorities and low-income populations that may be affected by restoration projects. West side communities include the Highway 26 corridor between Sandy and Government Camp, Estacada, and the Highway 22

corridor between Mill City and Idanha. More distant west side communities that have an interest in the Mt. Hood National Forest would include the Molalla area, the Woodburn area, and the Portland metropolitan area. North side communities in the Columbia River Gorge include Corbett, Bonneville, and Cascade Locks. Hood River Valley contains many communities including Hood River, Odel and Parkdale. The east side of the Forest has communities such as The Dalles, Dufur, Tygh Valley, Maupin and Warm Springs. Individuals from these communities may work, recreate or have other interests in the Forest that relate to roads.

Census data confirm that all of these communities contain minority and low-income populations. Poverty status ranges from 4 to 25 percent and minority populations range from 9 to 25 percent. In the rural communities and small towns, income is lower than the state and national averages and unemployment is higher than state and national averages. In recent decades, some rural areas have experienced an influx of high-income families that have moved to the country and commute to work in the Portland metropolitan area or other cities and towns. However there is still a small town and rural population that relies more on earning their living or supplementing their income on the Forest. Some of these rural communities have experienced downturns in their economies due to reductions in timber harvest and closure of sawmills and other associated facilities. Communities that are oriented around agriculture and livestock have also experienced downturns in economies.

The American Indian communities of Warm Springs and Grande Ronde may be affected by restoration projects. Tribal groups have been contacted about the proposed action and did not express any negative comments. There are no known areas of religious significance near restoration projects.

There are no known special places for minority or low-income communities on the Forest.

Potentially Affected Workers - Many people work in the Mt. Hood National Forest. Employment opportunities include logging and other work associated with timber sales such as tree planting; recreation including ski areas, lodges and river guides; and Forest Service employees and contractors. In recent years, the percentage of Hispanics working on the Forest has increased. Minority and low-income individuals may benefit from the employment opportunities generated by contracting restoration projects. The no-action alternative would not generate this income.

Some minorities and low-income people work in the forest gathering products. The primary products would include firewood, boughs, beargrass, mushrooms, huckleberries, Christmas trees and landscaping plants. Some of this gathering is for resale to generate income and some is for personal use or subsistence use. Permits are issued for most gathering but some minor uses occur without need for a permit. A large percentage of product gathering is by minority and low-income individuals to supplement their income or as a primary job. Asian Americans and Hispanics are frequent product gatherers. Roads provide access to the Forest for product gathering therefore closing or decommissioning roads would reduce forest product availability on a landscape level.

Potential Affect to Recreation - Minorities and low-income people recreate on the Mt. Hood National Forest. There are many campgrounds, lakes, trails, ski areas and other destination recreation features. Low-income recreators would more likely participate in lower cost recreation such as dispersed camping, fishing and hunting. Deducing road density would reduce opportunities for dispersed recreation.

Potential Affect to Health - Roads represent a potential source of pollution in the form of fine sediment that may move downstream to the intake of municipal water providers. Restoration projects may cause a short-term increase in sediment during project implementation but there would be long-term improvements to water quality. The proposed action does not involve the use of herbicides or pesticides.

Potential Affect to Environment - The following resources may be of particular value to minority and low-income communities: Rare plants and animals, fish, water quality, wildlife, old growth, soils, scenery, air quality and heritage resources.

No adverse impacts were identified that would have a disproportionate affect on minority or low-income communities.

CHAPTER 4 - CONSULTATION WITH OTHERS

A letter was sent to a mailing list of potentially interested parties including those individuals and groups that commented on similar past projects, adjacent property owners, water providers, watershed basin councils, other federal, state and county agencies, tribal officials, local environmental groups, and user groups.

This project has appeared in the publication "Sprouts," a quarterly newsletter sent out by the Mt. Hood National Forest to notify interested people, organizations, and other agencies of proposed projects and solicit comments on them.

From these public involvement efforts, no letters or other comments were received. After the 30-day comment period, a synopsis of comments and responses will be added to the Appendix. Consultation is ongoing with several agencies including National Oceanic and Atmospheric Administration (NOAA) Fisheries, the U.S. Fish and Wildlife Service, and the Oregon State Historic Preservation Office.

CHAPTER 5 - LIST OF PREPARERS

John Dodd	Team Leader
Darcy Morgan	Fisheries Biologist
Mark Kreiter	Soils/Hydrologist
Carol Horvath	Botanist
Marge Dryden	Archaeologist
Leslie Haysmith	Wildlife Biologist
Tom Deroo	Geologist
Jim Roden	Writer/Editor

Appendix A

Restoration 2003 Vicinity Map