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Department of
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Service**

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Environmental Assessment

South Fork McKenzie River Enhancement Project

McKenzie River Ranger District
Willamette National Forest
Lane County, Oregon

Legal Locations: T.18S and 19S, R.5 and 5 1/2E. W.M.

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Table of Acronyms

ACOE	Army Corps of Engineers
ACS	Aquatic Conservation Strategy
BA	Biological Assessment
BE	Biological Evaluation
BMP	Best Management Practice
DN/FONSI	Decision Notice/Finding of No Significant Impact
EA	Environmental Assessment
EDT	Ecosystem Diagnosis and Treatment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
IDT	Interdisciplinary Team
LAA	Likely to Adversely Affect
LRMP	Land Resource Management Plan
MA	Management Area
MIS	Management Indicator Species
MSA	Magnuson-Stevens Fisheries Conservation and Management Act
MWC	McKenzie Watershed Council
NEPA	National Environmental Policy Act
NFMA	National Forest Management Act
NLAA	Not Likely to Adversely Affect
NMFS	National Marine Fisheries Service
NOAA	National Oceanographic and Atmospheric Administration
NWFP	Northwest Forest Plan
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
ORV	Outstandingly Remarkable Value
OSHA	Occupational Safety and Health Administration
OSU	Oregon State University
PETS	Proposed, Endangered, Threatened, Sensitive species
PFMC	Pacific Fishery Management Council
ROD	Record of Decision
SHPO	State Historic Preservation Office
SOPA	Schedule of Proposed Actions
TES	Threatened, Endangered and Sensitive Species
USDA	United States Department of Agriculture
USDI	United States Department of Interior
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
WA	Watershed Analysis
WSR	Wild and Scenic River
WNF	Willamette National Forest

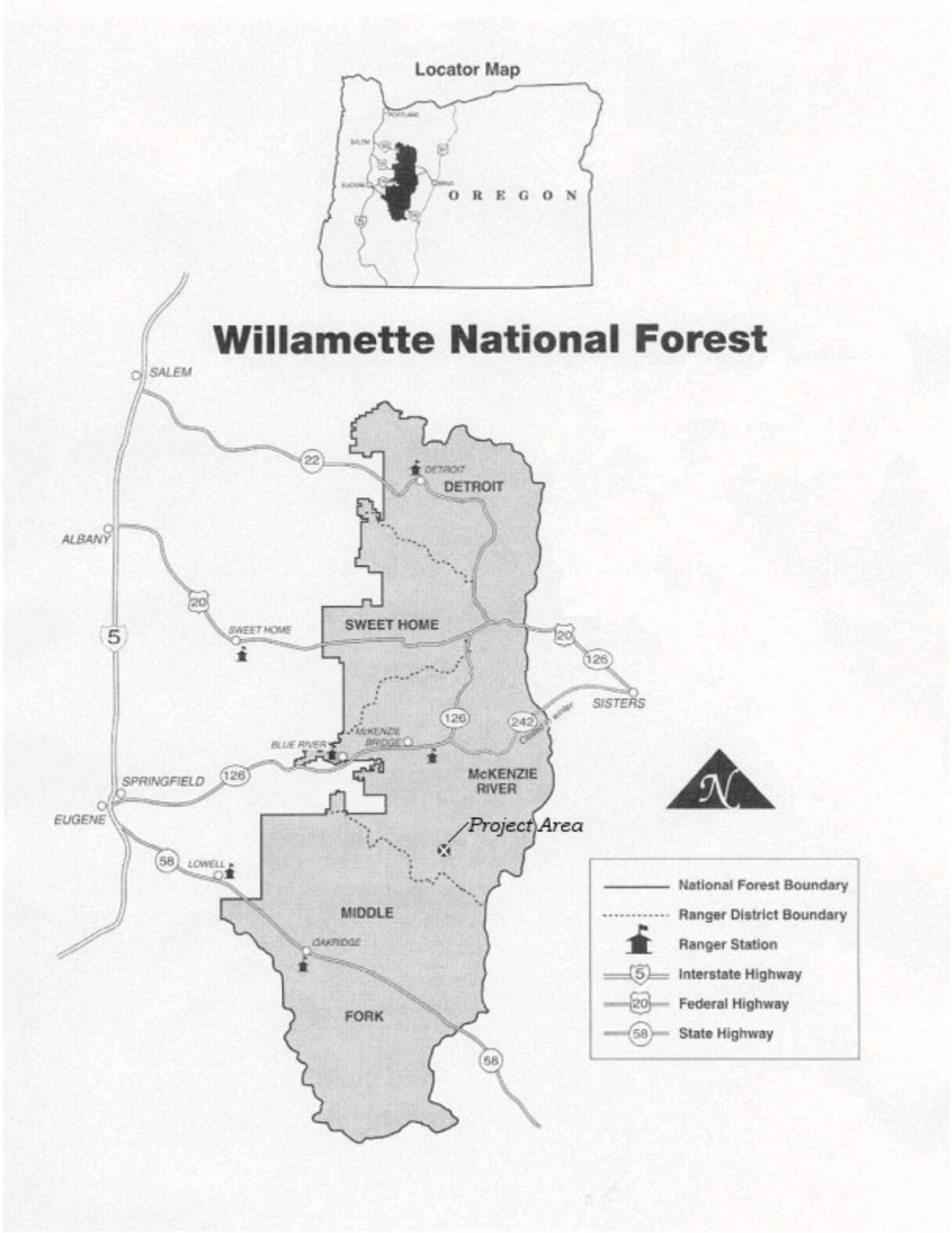
Chapter 1 – Purpose and Need

Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into four parts:

- **Introduction:** The section includes information on the history of the project proposal, the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- **Comparison of Alternatives, including the Proposed Action:** This section provides a more detailed description of the agency's proposed action as well as alternative methods for achieving the stated purpose. These alternatives were developed based on significant issues raised by the public and other agencies. This discussion also includes possible mitigation measures. Finally, this section provides a summary table of the environmental consequences associated with each alternative.
- **Environmental Consequences:** This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by significant issue. Within each section, the affected environment is described first, followed by the effects description.
- **Agencies and Persons Consulted:** This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- **Appendices:** The appendices provide more detailed information to support the analyses presented in the environmental assessment.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the McKenzie River Ranger District; McKenzie Bridge, Oregon.


Locator Map
OREGON
Willamette National Forest
SALEM
ALBANY
SPRINGFIELD
EUGENE
SWEET HOME
DETROIT
BLUE RIVER
McKENZIE BRIDGE
SISTERS
LOWELL
OAKRIDGE
McKENZIE RIVER
MIDDLE
FORK
Project Area
22
20
126
242
58
5
N
National Forest Boundary
Ranger District Boundary
Ranger Station
Interstate Highway
Federal Highway
State Highway

Background

The South Fork McKenzie River Enhancement Project Area is located on McKenzie River Ranger District of the Willamette National Forest (Figure 1). The proposed enhancement project is located within the South Fork McKenzie River Watershed, upstream of Cougar Reservoir. Proposed actions would occur within and adjacent to the South Fork McKenzie River reach immediately upstream (east) of Homestead Campground, ending just west of the confluence of Elk Creek with the South Fork McKenzie River, a distance of 8.0 miles, and within and adjacent to the lower ½ mile of Roaring River. The river elevations range from 2,200 ft. at Homestead Campground, to 2,250 ft. near Elk Creek confluence with the South Fork McKenzie River. The South Fork McKenzie River Enhancement Project originated with scoping at the McKenzie River Ranger District in November of 2005. The legal description of the project area: T.18S., R.5E., Sec. 25, 26, 36; T.18S, R.5 ½ E, Sec. 31, 32, 33; T.19S, R.5E, Sec. 1 and 2; Willamette Meridian. The proposed action is a continuation of enhancement work conducted during 1996 and 1998.

Purpose and Need for Action

The purpose for action is to enhance habitat and water quality conditions for spring Chinook salmon and bull trout to meet direction in the Willamette National Forest Plan as amended, and move toward recovery of both Threatened species as directed by the Endangered Species Act.

The need for action was documented in findings of the South Fork McKenzie Watershed Analysis (USFS 1994) where loss of early life habitat for bull trout and spring Chinook salmon in the upper South Fork McKenzie River and lower Roaring River was found. Recommendations from the South Fork McKenzie Watershed Analysis place highest priority on recovery of aquatic habitat in the South Fork McKenzie River. As a Tier 1 Key Watershed, the South Fork McKenzie River is highest priority under the Northwest Forest Plan for protecting and restoring aquatic habitat.

This project seeks to restore habitat prioritized by McKenzie sub-basin partners in the McKenzie Watershed Council (MWC). Sub-basin assessments conducted by the MWC found the lower McKenzie River and South Fork McKenzie River as highest priority for restoration though Ecosystem Diagnosis and Treatment (EDT) evaluation (Primozich and Bastach, 2004).

Currently, a permanent trap-and-haul facility is planned by Army Corps of Engineers to collect adult spring Chinook salmon and bull trout below Cougar Dam. The facility will reconnect, through physical transport, migrating spring Chinook and bull trout to the river above the dam. Utilization of naturally produced and migrating spring Chinook and bull trout is expected to benefit South Fork McKenzie specific fish populations and assist in perpetuating local adaptation. The Cougar Dam trap-and-haul facility is expected to be complete in 2009.

Proposed Action

The District Ranger on the McKenzie River District proposes to supplement existing in-stream large woody material for aquatic habitat enhancement within an 8.5 mile reach of the South Fork McKenzie River and lower Roaring River. This project would place large diameter trees with root-masses attached into the stream channel to mimic natural log jams. Enhancement activities involve tipping into the river approximately 40 live trees that are adjacent to the river to serve as "Key Features". Approximately 300 pieces of woody material would then be imported from other locations in the area to provide for log jam accumulations behind the key features. Any previously-placed woody material within this reach would be repositioned.

To improve water quality, the proposed action includes the closure of 12 non-system, native surfaced road segments that currently access dispersed camping sites.

Implementation of this proposal, represented as Alternative A in Chapter 2, would begin in the summer of 2007.

Decision Framework

The Responsible Official for this proposal is the McKenzie River District Ranger. Given the purpose and need stated above, the Responsible Official reviews the proposed action and the other alternative actions in order to make the following determinations:

- The proposed actions as analyzed, comply with the applicable standards and guidelines found in the Willamette Forest Plan and all laws governing Forest Service actions.
- Sufficient site-specific environmental analysis has been completed.
- The proposed actions benefit the public and are in their best interest.

With these assurances the Responsible Official must decide:

- Whether or not to accept the proposed actions in Alternative A or the No-Action Alternative; and what, if any, additional actions should be required.

Tiering and Incorporating by Reference

In order to eliminate repetition and focus on site-specific analysis, this EA is tiered to the following documents as permitted by 40 CFR 1502.20:

The Willamette National Forest Land and Resource Management Plan (Forest Plan) FEIS and Record of Decision (ROD) dated July 31, 1990, and all subsequent NEPA analysis for amendments, including the April 1994, Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Spotted Owl, or Northwest Forest Plan (USDA Forest Service and USDI Bureau of Land Management. 1994), and the accompanying Land and Resource Management Plan, as amended. The Forest Plan guides all natural resource management activities and establishes management standards and guidelines for the Willamette National Forest. It describes resource management practices, levels of resource production and management, and the availability and suitability of lands for resource management.

This EA is also tiers to a recent broader scale analysis for invasive plants (the Pacific Northwest Region Final Environmental Impact Statement for the Invasive Plant Program, 2005, hereby referred to as the R6 2005 FEIS) (USDA Forest Service. 2005). The R6 2005 FEIS culminated in a Record of Decision (R6 2005 ROD) that amended the Willamette National Forest Plan by adding management direction relative to invasive plants. This project is intended to comply with the new management direction. The proposed action would also incorporate measures contained in the December 1988, Record of Decision and FEIS for Managing Competing and Unwanted Vegetation, and the requirements of the Mediated Agreement, signed May 24, 1989 by USFS, NCAP, OFS, et al.

Watershed Analysis

The Aquatic Conservation Strategy in the Northwest Forest Plan includes two designations for Key Watersheds: Tier 1 and Tier 2. The project area is located in the upper South Fork McKenzie River watershed and is classified as a Tier 1 Key Watershed, which includes a conservation emphasis.

The South Fork McKenzie Watershed Analysis, completed in October 1994, developed and documented a scientifically based understanding of the processes and interactions occurring within the watershed. The South Fork McKenzie River contributes directly to conservation of Endangered Species Act (ESA) listed Upper Willamette spring Chinook salmon and bull trout. The South Fork McKenzie River above and below Cougar Dam is designated Critical Habitat for spring Chinook salmon. The amended Forest Plan requires that actions be designed to maintain or restore aquatic habitat and riparian ecosystems in accordance with the Aquatic Conservation Strategy objectives found in the Northwest Forest Plan ROD. A high priority recommendation from the South Fork McKenzie River Watershed Analysis is to improve aquatic habitat for bull trout and spring Chinook salmon in the South Fork McKenzie and Roaring River, upstream of Cougar Reservoir.

The Forest Plan

The Willamette Forest Plan, as amended, provides resource management goals and gives direction for at-risk species recovery and habitat restoration. Table 1 displays Management Areas within the South Fork McKenzie project area designated in the 1990 Willamette Forest Plan, and also includes the overlying land allocations from the 1994 Northwest Forest Plan (Congressionally Reserved Areas, Late-Successional Reserves, Adaptive Management Areas, Administratively Withdrawn, Riparian Reserves and Matrix). Management Areas (MAs) are units of land with boundaries that can be located on the ground, each having specific direction for management as detailed in the Forest Plan. Management Area direction consists of an emphasis statement, goals, desired future condition, and a description of Standards and Guidelines. In addition, the Forest Plan contains Forest-wide standards and guidelines that apply to all management areas unless specifically exempted by Management Area direction.

Table 1: Willamette Forest Plan Management Areas

Willamette Forest Plan Management Areas	Northwest Forest Plan Land Allocations
MA-15 – Riparian Area	Riparian Reserve
MA-6C – South Fork McKenzie River Wild & Scenic Study River (Recreation)	Administratively Withdrawn
MA-5A – South Fork Corridor Special Interest Area	Administratively Withdrawn
MA-9D – Special Habitat Area (Winter Elk Habitat)	Administratively Withdrawn
MA – 11A – Scenic Modification Middleground	Matrix

MA-15 Riparian Reserves

The primary goal in this management area is to maintain the role and function of rivers, streams, wetlands, and lakes in the landscape ecology. Riparian Reserves are one of the six designated management areas identified in the Northwest Forest Plan. Riparian Reserves usually include at least the water body, inner gorges, all riparian vegetation, 100-year floodplain, landslides, and landslide-prone areas. Reserve widths are based on some multiple of a site-potential tree, or a prescribed slope distance, whichever is greater. Along the South Fork McKenzie and Roaring River, the Riparian Reserve width is two site-potential tree widths, or 360 feet. Reserve widths may be adjusted based on watershed analysis to meet Aquatic Conservation Strategy (ACS) objectives from the Northwest Forest Plan. The ACS was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems on public lands by maintaining and restoring ecosystem health at watershed and landscape scales. The intent is to protect habitat for fish and other riparian-dependent species and to restore currently degraded habitats. The proposed action is located largely within the Riparian Reserve. Temporary storage of large woody material and a helicopter service site are located on existing landings outside the Riparian Reserve in MA-9D and MA-11A, described below

MA-6C, Wild and Scenic Study River – South Fork McKenzie River

Wild and Scenic Rivers Act: The South Fork McKenzie River is a Wild and Scenic Study River (WSR) because it possesses several Outstandingly Remarkable Values (ORV's) such as: prominent recreational opportunities, spectacular scenery, diverse fish populations and prehistoric values. The South Fork McKenzie River was found to be eligible for designation in an Eligibility Determination (USDA Forest Service, Willamette National Forest 1992). It has not yet been designated a Wild and Scenic River.

For the purpose of classification, the river is divided into three segments. Segment 1 originates in the Three Sisters Wilderness and is classified as *Wild* and ranges from its headwaters downstream to the wilderness boundary. Segment 2 and Segment 3 are paralleled by Forest Road

19 and are classified as *Recreation*. Segment 2 ranges from the Three Sisters Wilderness boundary downstream to the head of Cougar Reservoir. Segment 3 is located downstream of Cougar Dam to the South Fork McKenzie confluence with McKenzie River. The proposed enhancement project occurs within the channel and Riparian Reserve of Segment 2 (upstream of Cougar Reservoir) in a recreation emphasis Wild and Scenic reach.

Although the South Fork McKenzie has not been designated a Wild and Scenic River, Willamette National Forest plan direction requires it be managed as though it were until its WSR designation is decided. This analysis will examine potential project effects to the Outstandingly Remarkable Values of the Wild and Scenic Study River. An analysis of potential project effects to the Outstandingly Remarkable Values of the Wild and Scenic Study River (South Fork McKenzie Wild and Scenic Section 7 Analysis; Appendix A) has occurred with this project proposal.

Oregon State Scenic Waterway

The South Fork McKenzie River is designated an Oregon Scenic Waterway, a State of Oregon designation. The Oregon Scenic Waterway program is administered by the Oregon State Parks and Recreation Department. Goals of the program include: 1) protecting the free-flowing character of Oregon state rivers that are designated scenic waterways for fish, wildlife and recreation; 2) protect and enhance scenic aesthetic, natural recreation, scientific, and fish and wildlife values along scenic waterways; and 3) encourage other local, state, and federal agencies to act consistently with the goals of the program. The Oregon State Parks and Recreation Department reviews plans and decisions made by other agencies to ensure consistency with the Scenic Waterway program. The Oregon State Parks and Recreation Department was involved in evaluation of the South Fork's resources and qualities using Oregon Scenic Waterway standards. Concurrence of project effects to Oregon Scenic Waterway values with Oregon State Parks and Recreation Department is necessary prior to project implementation.

MA-5A, Special Interest Area

The goal of this management area is to preserve lands that contain exceptional scenic, cultural, biological, geological or other unusual characteristics, and to foster public use and enjoyment in selected special interest areas through facility development. The area and goals of Wild and Scenic Rivers (MA-6C) and Riparian Reserve (MA-15) overlap with MA-5A in the project area. The most restrictive standard and guidelines among the three management areas in the project area are used to guide management activities.

MA-9D, Special Habitat Area

The goal of this management area is to protect or enhance unique wildlife habitats and botanical sites which are important components of healthy, biological diverse ecosystems. The Special Habitat Area in the South Fork McKenzie is recognized for its value as winter elk habitat.

MA-11A, Scenic Modification Middleground

The goal of this management area is to create and maintain desired visual characteristics of the forest landscape through time and space. This area will also be managed for other resource goals including timber production, recreation opportunities, watershed protection, and maintenance of wildlife habitats.

Public Involvement

The South Fork McKenzie River Enhancement Project preliminary analysis began in November 2005 when it was scoped among McKenzie River Ranger District staff and specialists. The project was first listed in the April 1, 2006 issue of the Forest Focus - the quarterly schedule of proposed actions (SOPA) for the Willamette National Forest.

On August 28, 2006, a scoping letter was mailed to individuals and organizations who have expressed an interest in similar projects on the McKenzie River District. Using the comments received from the public and other agencies, the interdisciplinary team developed a list of issues to address.

Comments received were related to the historic condition of the South Fork McKenzie River and recovery of spring Chinook salmon and bull trout in the South Fork McKenzie watershed. Mr. Cole Gardiner of Portland, Oregon provided a pre-management description of the South Fork McKenzie River channel. Mr. Gardiner had fished the South Fork McKenzie River as a youth in the 1930's and continued as an adult into the 1950's. His description of in-stream wood volume and angled species distribution support the findings of the South Fork McKenzie Watershed Analysis and watershed analysis recommendations for habitat restoration. Comments supporting restoration of habitat for bull trout and spring Chinook were received from the McKenzie River Trust, ODFW and ACOE. The IDT considered all comments during issue development and analysis of the proposed action for this project.

Issues

Scoping is the process for determining issues relating to a proposed action and includes review of written and telephone comments, distribution of information about the project, Interdisciplinary Team (IDT) meetings and correspondence with the public, Tribes, government agencies, and elected officials (Chapter 4, Consultation with Others). The interdisciplinary team and responsible official considered these pertinent issues and have determined which are significant to the project. Two Significant Issues drove the development of the alternatives. Their description is followed by criteria for measuring alternative effects. The Significant Issues are tracked through issue identification in this Chapter and environmental consequences in Chapter 3. Non-significant issues and reasons regarding their categorization as non-significant are described below.

Significant Issues

1. Water Quality/Aquatic Resources

Past management activities have resulted in impacts to the riparian and aquatic resources of the analysis area. Proposed activities can adversely affect water quality and aquatic and riparian habitat through the reduction of large wood available for input to streams, through removal of streamside vegetation, and/or through increases in sedimentation. These effects can result in simplification of aquatic habitat important to native and listed fish species and degradation of water quality with respect to elevated stream temperatures or increases in sedimentation. Analysis of this issue addresses project impacts on Wild and Scenic Study River ORV of fish. The effects of this project on water quality and stream habitat will be evaluated by the following criteria:

To evaluate a net increase or decrease of riparian habitat and in-stream large wood the following will be analyzed:

Criteria: Amount of riparian habitat altered, and changes to in-stream large wood quantities.

Unit of Measure: Acres riparian habitat; pieces of LWM per mile.

To evaluate change in stream shade and potential to increase river temperatures, the following will be analyzed:

Criteria: Potential increase in river temperature using Brown's model to evaluate.

Unit of Measure: Degrees Fahrenheit change.

2. Recreational Opportunity

The proposed action may affect recreational camping opportunity through treatment of non-system roads. Restriction of vehicle access to some riparian areas may alter dispersed camping opportunity where roads cross live channels or wet areas. The proposed action may beneficially affect the opportunity for a high quality recreational experience within the project area. The proposed action may affect recreational kayaking opportunity through restoration of large woody material to the South Fork McKenzie and Roaring River channels. Analysis of this issue addresses project impacts on Wild and Scenic Study River ORV of recreation.

The effects of this project on recreational opportunity will be evaluated by the following criteria:

Criteria: Amount of dispersed camping opportunity altered.

Unit of Measure: Number of roads blocked. Number of dispersed campsites not accessible by vehicle.

Criteria: Amount of kayaking opportunity altered.

Unit of Measure: Length of channel modified through addition of large woody material.

Other Issues

Forest Service regulations [1950, chapter 11(3)] require that issues that are not significant to the project or that have been covered by prior environmental review be identified and eliminated from detailed study. Discussion of these issues should be limited to a brief statement of why they will not have a significant effect on the human environment or a reference to their coverage

elsewhere. The following issues were identified during scoping as being non-significant issues but are required to be evaluated by regulations (40 CFR 1502-16) or management direction.

3. Threatened, Endangered, Sensitive Plant and Wildlife Species

Activities that remove or degrade forest habitats might possibly affect a variety of wildlife and botanical species. Activities that create noise above ambient levels may also impact a variety of wildlife species.

This issue was not considered significant because all actions that remove or degrade forest habitat would be required to follow conservation and protection guidelines provided by the Willamette Forest Plan to avoid adverse affects on listed species. Activities that generate noise above ambient levels near nest sites of threatened or endangered or sensitive wildlife species would be seasonally restricted. Design measures and mitigation measures address this issue in Chapter 2. The effects of the proposed action and the other alternatives on TES species are addressed in Chapter 3.

4. Hydroelectric Operations

Cougar Reservoir, operated by Army Corps of Engineers, is located downstream of the proposed project area. Proposed activities could potentially interfere with reservoir operation through the migration of restoration material. These effects can result in increased reservoir maintenance costs. ACOE and USDA Forest Service share periodic maintenance of the reservoir surface, sweeping it of floating debris generally deposited during flood events, to reduce interference with flood control/hydroelectric operations. This issue is not significant to the proposed action due to the low likelihood of material migration to the reservoir and the action agency's shared responsibility for reservoir sweeps.

5. Visual Quality

Visual quality in the project area could be impacted by the action alternative through creation of openings from tipping of riparian reserve trees. The viewshed of the project area includes the South Fork McKenzie Wild and Scenic Study River corridor (MA-6c) and Oregon State Scenic Waterway. This issue is not significant to the proposed action because use of Riparian Reserve trees within MA-6c would be in a dispersed fashion and would not create visually apparent openings (single tree utilization from a stand). Maintenance of the visual quality adjacent to the river corridor and natural character within the channel would be maintained. Project impacts on Wild and Scenic Study River ORV of scenery are described in Appendix A.

6. Noxious Weeds

Proposed actions may introduce or spread noxious and non-native invasive plants. Ground disturbance and openings in the forest canopy from this proposal can provide an opportunity for noxious and non-native plants to establish and out-compete desired native vegetation. Spotted knapweed (*Centaurea maculosa*) is the most serious noxious threat to native plant populations within the watershed. Spotted knapweed has a broad ecological tolerance, prolific growth, and abundant seed production. It is spread primarily by vehicular traffic and has quickly become established along State Highways 126 and U.S. Highway 20.

This issue is not significant to the proposed action due to prevention measures used to limit expansion of existing populations. Prevention measures used in the watershed include: manual or mechanical weed removal, competitive planting, chemical treatments to specific populations. Cleaning project equipment and closure of dispersed camping access roads to vehicle traffic are expected reduce potential spread.

7. Soil Erosion

Ground disturbance that occurs during tree tipping may result in an increased risk of soil erosion and transport of sediment to stream channels. This issue is not significant to the proposed action due to project mitigations requiring ground-disturbing equipment remain on roads and prohibited from non-road portions of the Riparian Reserve. Trees tipped adjacent to river channels would be accomplished in a dispersed fashion with a small cumulative area of disturbance. Potential project generated sedimentation of aquatic habitat is addressed under the significant issue of Water Quality/Aquatic Resources.

8. Management Indicator Species

Proposed actions could affect Management Indicator Species located within the project area as listed and described in the Willamette Forest Plan. The Forest MIS species list includes the northern spotted owl, pileated woodpecker, marten, elk, deer, cavity excavators, bald eagle, and peregrine falcon; along with anadromous fish species spring Chinook salmon and resident fish species rainbow trout and cutthroat trout. Through Region-wide coordination each Forest identified the minimum habitat distribution and habitat characteristics needed to satisfy the life history needs of MIS. Management recommendations to ensure the viability of Management Indicator Species were incorporated into all action alternatives analyzed in the 1990 Willamette Forest Plan FEIS.

This issue was not considered significant because action alternatives from this project meet applicable Standards and Guidelines from the Willamette Forest Plan, and are designed to protect these species. The effects of the proposed action and other alternatives on MIS are addressed in Chapter 3.

9. Neotropical Migratory Land Birds

This project could affect Neotropical Migratory Birds and their habitat, which varies broadly for this large group of species. Required-protection for these species is outlined in Executive Order 13186 on January 11, 2001, titled “Responsibilities of Federal Agencies to Protect Migratory Birds.”

This issue was not considered significant because the tipping of trees associated with this project, which may unintentionally affect individual migratory birds, is not expected to have a measurable negative effect of bird populations because of the limited extent of the habitat removal. The effects of the proposed action and other alternatives on migratory land birds are addressed in Chapter 3.

10. Survey and Manage Wildlife and Botanical Species

The proposed action could affect Survey and Manage Wildlife and Botanical species. This issue is not significant to the proposed action due to project scale and mitigations requiring ground disturbing equipment remain on roads and prohibited from non-road portions of the Riparian Reserve. Trees tipped adjacent to river channels would be accomplished in a dispersed fashion with a small cumulative area of disturbance.

11. Cultural Resources

Surveys conducted for this project did not uncover any new historic properties. However, previous surveys within this landscape have documented cultural resource sites. Proposed ground-disturbing activities would avoid these eligible or potentially eligible historic properties. This issue is not significant to the proposed action because avoidance of existing and subsequent discovery sites would be required during project implementation. The District Archeologist would evaluate any subsequent discoveries.

Chapter 2 – Alternatives

This chapter describes and compares the alternatives considered for the South Fork Project. It includes a description and map of alternatives considered. This section also presents the alternatives in comparative form, defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public.

Alternatives

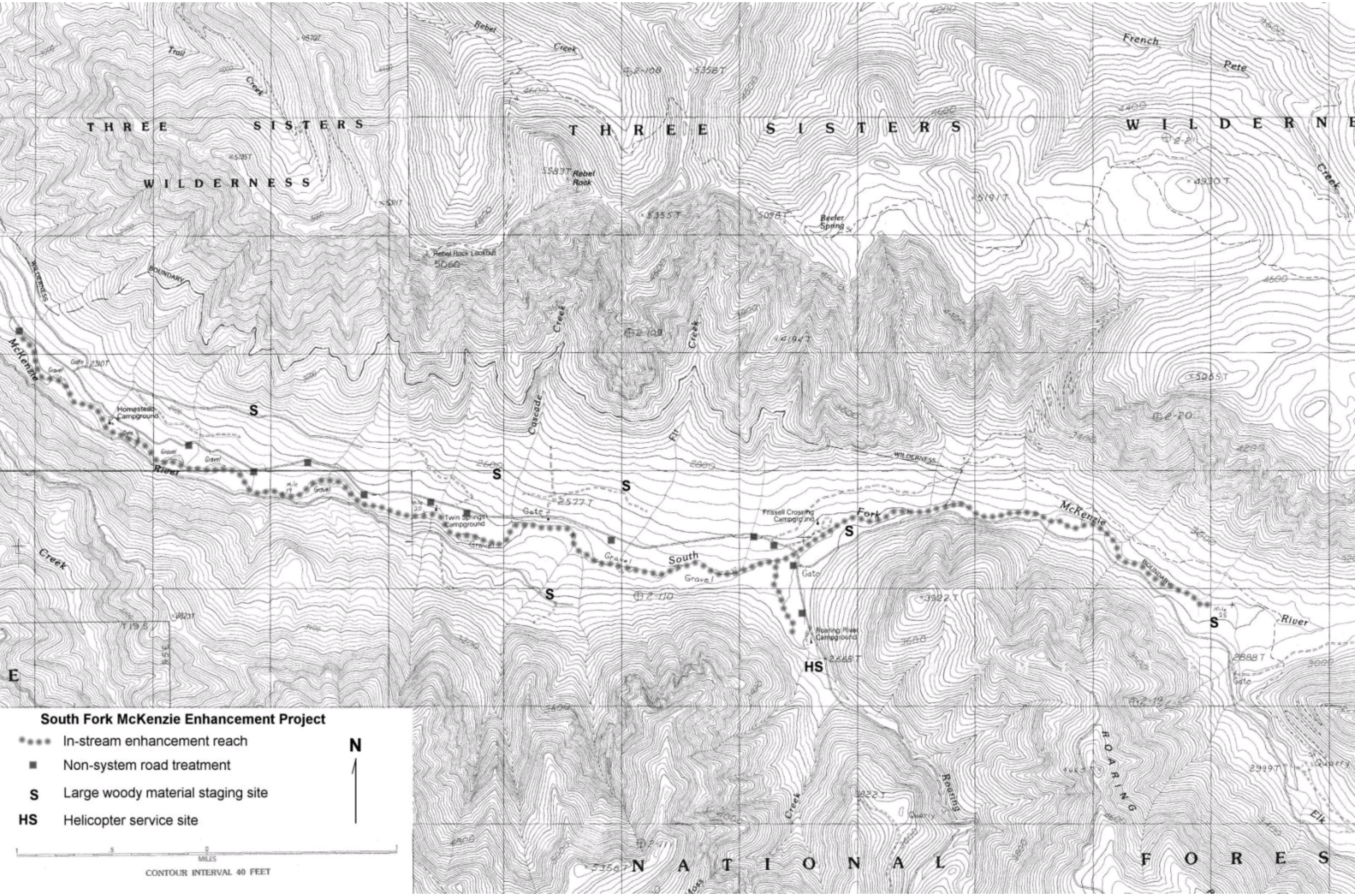
Alternative A – Proposed Action

The South Fork McKenzie River Enhancement Project (South Fork Project) proposes supplementation of existing woody material to act as flow deflection and develop off-channel habitat. The large woody material (LWM) would be placed in the South Fork McKenzie and Roaring River channel upstream of Homestead Campground (Figure 2). Existing large woody material would be supplemented with trees selected from the adjacent Riparian Reserve, and with imported woody material from nearby upland sources. The collection and staging of LWM from an upland source will be evaluated as part of this project.

Project methods to place woody material were selected to minimize impacts to other resources. Cables would be used to pull over live trees from the Riparian Reserve. Equipment used to tip live trees would work from Rd 1900-431, Rd 1964 and non-system roads. Following placement of key features, material would be imported using helicopter, or by hand-crews, to form accumulations. Helicopter or hand-crew placement provides full suspension to place imported material and presents minimal disturbance of the river bottom and adjacent riparian area. By importing approximately 300 pieces of LWM, the proposed final density of large woody material would be about 80 pieces in the 8.5 mile enhancement reach.

Approximately forty trees would be utilized from the adjacent Riparian Reserve to serve as "key" features behind which imported material would stabilize. Key features are large diameter trees, with root mass attached, selected for their ability to remain stable during most high flow events. The live trees selected to serve as key features are located at distances from the channel from stream bank to 50 feet from the active channel. The size of tree selected for key features ranges from 22 to 52 inches in diameter at breast height, averaging 32 inches in diameter. The trees selected for restoration of in-stream wood are dispersed through the 8.5 mile enhancement reach on each bank. Twenty-six trees are located along the left bank, looking downstream (Rd 431 and Rd 1964 side), and fourteen along the right bank (Rd 19 side).

Once key features are in place in the channel, helicopter and/or hand-crew placement of imported material would occur. Material would be added upstream of each key piece of woody material, to mimic natural accumulations or jams. Woody material jams would consist of 2-8 piece accumulations. Numerous opportunities exist for channel spanning accumulations. Tree tipping would occur during mid-summer and helicopter and/or hand-crew placement would occur following key wood placement, during late summer. All placement activity would occur during the ODFW in-stream work period and outside wildlife restriction periods for the project area,


South Fork McKenzie Enhancement Project
In-stream enhancement reach
Non-system road treatment
S Large woody material staging site
HS Helicopter service site
N
MILES
CONTOUR INTERVAL 40 FEET
THREE SISTERS WILDERNESS
THREE SISTERS WILDERNE
NATIONAL FORES
McKenzie
River
South
Fork
Homestead Campground
Twin Springs Campground
Frissell Crossing Campground
Roaring River Campground
Rebel Rock Lookout
Rebel Rock
Beeler Spring
Cascade Creek
Fir Creek
Rebel Creek
French Pete Creek
Roaring River
Elk
Gate
Gravel
Quarry
BOUNDARY
WILDERNESS

July 15 through August 15, to minimize impacts to wildlife and fisheries. Project implementation is planned to occur beginning in summer season 2007 and is dependent upon equipment and crew availability.

An existing helicopter landing for refueling and service is located on Road 1900-985. Road 1900-985 is ¼ mile long, located adjacent to Roaring River. A spill containment structure would be required of potential helicopter use of Rd 1900-985 landing. Restoration material would be staged in landings on Rd 1900-425, Rd 1900-429, Rd 1900-431, Rd 1964 and Rd 1964-414. Restoration material destined for helicopter transport to the enhancement reach would be collected from road-side salvage and existing stockpiles and would consist of whole trees with root-mass intact and root-less tree boles. Enhancement material would be flown directly from the staging areas to the river reach. A Flight Safety Plan and Spill Plan will be required prior to flight operations. Timing requirements for implementation are estimated at 3-4 days for placement of stream adjacent trees and 1-2 days for aerial placement of staged material. Equipment cleaning precautions will be utilized to avoid potential introduction or spread of noxious plants from ground based equipment.

Maintenance of previously placed in-stream project wood would be accomplished with this proposal. Project work completed during 1996 and 1998 would be repositioned by helicopter or hand crews. Approximately 400 pieces of large woody material would be repositioned in the 8 mile South Fork McKenzie. Smaller sized material may be placed by hand to minimize disturbance to riparian and aquatic habitat. Previously placed small material that can be handled by a crew of 6-8 would be lifted from nearby river banks and transported to a channel destination. The option of using hand crews or helicopter in placing small material (500-800 pounds in weight) is dependent upon crew and equipment availability.

Large woody material placed in the restoration reach will not be attached by artificial means such as cable. The placement of whole trees, with a portion on the bank, particularly trees with root-mass intact, is expected to contribute to in-stream structure stability. A pre-project record of the restoration reach was made through low elevation photography. Currently existing large wood was tagged during field surveys conducted by Oregon State University during September 2001. Material of natural and human-placed origin and side channel development would be monitored through periodic low elevation aerial photography.

Treatment of 12 non-system roads through barrier placement or campsite delineation would result in alteration of access to 12 dispersed campsites. Road accesses that travel through the South Fork McKenzie and Roaring River floodplains would be modified to exclude vehicle entry into stream channels and wet areas. Treatment would involve delineation of vehicle access using boulders or berms. Where necessary, a seedbed on road surfaces would be prepared through scarification or ripping. Approximately 3,000 feet of road surfaces would be seeded and planted using native plants following soil preparation. On roadbeds re-vegetating naturally, or in wet areas, treatment of road surfaces would not be necessary. Several campsites require rehabilitation to address degraded site conditions, such as denuded stream banks, eroding soils and drainage problems. Proposed treatments include planting campsite perimeters, drainage improvement and water-barring, and importing organic material to stabilize soils. There would be no change in

access to 14 dispersed campsites, with modification of access to 12 dispersed campsites. The 12 dispersed campsites would continue to exist and be accessible to foot traffic.

Alternative A – Implementation and Effectiveness Monitoring

Implementation monitoring by project personnel during project activities would consist of contract administration to ensure contract requirements are met. Surveys of the magnitude and extent of disturbance and application of mitigation measures (such as treatment of disturbed soils) would follow implementation to minimize project adverse effect.

Effectiveness monitoring would consist of evaluation of pre- and post-project aerial photography to quantify off-channel habitat development. Ground verification of aerial photographs would occur. Forest Service cooperative monitoring of biological response with ODFW (redd surveys to monitor spawning populations) and ACOE (juvenile spring Chinook salmon migrant trapping) would be expected to reflect changes in aquatic habitat quality.

Alternative A – Estimated Project Cost

Project implementation costs are estimated at $175,000 and include tree tipping, helicopter placement, road treatment and application of mitigation measures. Project effectiveness monitoring is estimated to cost $3,000-6,000 per year monitored and would occur in post-project Year 1 and following flood events exceeding 10 year recurrence interval. Estimated monitoring costs include periodic aerial photography that would also follow 10 year or greater flood events. Total effectiveness monitoring costs are estimated to range from $9,000-12,000. Forest Service cost of cooperative biological monitoring is part of the District Fisheries Program and occurs independently of the proposed action (approximately $900 annually).

Alternative B – No Action

The No Action alternative continues with the current management situation and would not implement actions to restore in-stream large woody material in the South Fork McKenzie project area. Aquatic habitat degradation and water quality impacts presented by continuing use of non-system roads in wet areas would continue. This alternative allows low in-stream wood density and simplified habitat to continue untreated and dependant upon natural rates of input to replenish existing condition. Under the No Action alternative, current management plans would continue to guide management of the project area. Alternative B would not affect recreational opportunity. The No Action alternative provides a basis for describing the environmental effects of the proposed action.

Mitigation Common to All Alternatives

In response to public and resource management objectives regarding the proposed action, mitigation measures were developed to ease impacts the action alternative may cause.

Soil, Watershed, and Fisheries Protection:

- Ground-based systems employed to tip live trees into the river channel would operate from existing road surfaces. The objectives are to maintain water quality and fish habitat, and to limit impacts to sensitive soils and ecosystems.
- Oregon Department of Fish and Wildlife guidelines for timing of in-water work will be followed to avoid impacts to presence of spring Chinook and bull trout adults (implementation would occur July 15 to August 15).
- Areas of disturbance and road bed preparation will be seeded with native perennial species and planted with native conifers.
- Spill plans will be in place prior to project equipment near aquatic habitat.

Wildlife:

- Protect snags greater than 12 inches diameter at breast height throughout the project area.
- A seasonal restriction on tree tipping and helicopter use is required from January 1 – July 15 to avoid disturbance to spotted owls, peregrines, and harlequin ducks.

Botany - Noxious Weeds:

- All equipment utilized in restoration activity would be pressure washed to remove all dirt and debris prior to entering National Forest System lands.
- Post treatment survey and control of noxious weeds would be applied to all disturbed areas within the project area to ensure any new infestation are eradicated in a timely manner.
- Survey and Manage Wildlife, Vascular Plants, Lichens, Bryophytes, and Fungi: A 180 or 360 foot no-disturbance buffer would be placed around each survey and manage species site.
- Bare soil will be rehabilitated with native vegetation appropriate for the area and designated weed-free mulch materials.

Heritage Resources:

- Cultural resource discoveries made during project operation will necessitate avoidance of the site until the cultural resources in question can be evaluated by the Zone Archeologist. Known cultural resource sites will be avoided with a 100 foot safety buffer.

Recreation and Human Safety:

- Project activities will be done in a manner that ensures public and operational safety. Prior to project operations, the project area will be posted for public notification of temporary closure. Traffic control will be required of contractors conducting tree tipping, flight operations and non-system road decommissioning. During operations, non-project personnel will be prohibited from the vicinity of operations. Public reoccupation of the project area will occur only following cessation of operations and inspection of the area. Areas found unsafe for reoccupation will be closed to the public until the hazard is remedied.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2: Comparison of Alternative by Key Issue

Alternative A (Proposed Action)

Key Issue	Measurement Criteria	Project Proposal
Water Quality/Aquatic Resources	Riparian habitat altered (acres)	Less than 1 acre (including roads treatment)
	LWD volume (LWD/mile)	Increase to 80 LWD/mile
	Stream shade/temperature (^{o}F)	Potential increase 0.007^{o}
Recreational Opportunity	Number of non-system roads blocked	12
	Dispersed campsites not accessible by vehicle	1.4 sites per mile (12 dispersed campsites) No change in access to 14 dispersed campsites
	Length of channel modified (kayak opportunity)	8.5 mile reach

Alternative B (No Action)

Key Issue	Measurement Criteria	Project Proposal
Water Quality/Aquatic Resources	Riparian habitat altered (acres)	No change in riparian habitat
	LWD volume (LWD/mile)	Natural recruitment to supplement existing 29 LWD/mile
	Stream shade/temperature (^{o}F)	No change in stream temperature
Recreational Opportunity	Number of non-system roads blocked	No change in non-system roads
	Dispersed campsites not accessible by vehicle	No change in 26 sites accessible by road in the project area
	Length of channel modified (kayak opportunity)	No project modification of channel

Chapter 3 – Affected Environment and Environmental Consequences

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above.

The cumulative effects discussed in this section include an analysis and a concise description of the identifiable present effects of past actions. The cumulative effects of the proposed action and the alternatives in this analysis are based on the aggregate effects of the past, present, and reasonably foreseeable future actions. Individual effects of past actions are not listed or analyzed, and are not necessary to describe the cumulative effects of this proposal or the alternatives. (CEQ Memorandum, Guidance on the Consideration of Past Actions in Cumulative Effects Analysis, June 24, 2005.)

Water Quality/Aquatic Resources - Affected Environment

Affected Environment

The South Fork McKenzie Project analysis area considers the 137,500 acre South Fork McKenzie River 5th field watershed (area of the South Fork McKenzie Watershed Analysis) which is located nearly entirely on federally managed land. Timber harvest, salvage and road building has been a dominant disturbance on the forested landscape for the past 50 years impacting approximately 46% of the area considered in the analysis. Prescribed burning, wildfires, windthrow, and insect and disease have had much less affect during that time.

Status of Listed Species

Spring Chinook salmon utilize habitat in the McKenzie River and South Fork McKenzie River, which flows through and downstream of the project area. Salmon are part of the Upper Willamette spring chinook salmon Evolutionarily Significant Unit (ESU), as designated by the National Oceanic and Atmospheric Administration (NOAA) Fisheries with a July 10 Federal Register notice, effective September 8, 2000. The McKenzie River and South Fork McKenzie River are included in the designation of Critical Habitat for the Upper Willamette spring Chinook salmon ESU. Streams occupied by spring Chinook salmon within the McKenzie River and South Fork McKenzie River below Cougar Dam are also designated as Essential Fish Habitat (EFH) by National Marine Fisheries Service (NMFS) under the Magnuson-Stevens Fishery Conservation and Management Act. Essential Fish Habitat is not designated above Cougar Dam.

Bull trout utilize habitat in the South Fork McKenzie and Roaring River, within and downstream of the project area. Bull trout were listed as Threatened by the U.S. Fish and Wildlife Service with a June 12, 1998 Federal Register notice to protect the Columbia River Distinct

Population Segment (DPS), and are protected under the Endangered Species Act. Critical Habitat for bull trout is designated in the mainstem McKenzie River, downstream of the confluence of South Fork McKenzie River. There is no Critical Habitat designation for bull trout in the South Fork McKenzie River.

The project area reach located between Homestead Campground and Elk Creek confluence and lower Roaring River is known habitat for spring Chinook salmon and bull trout. Roaring River is used by bull trout and spring Chinook salmon as spawning and rearing habitat. Bull trout utilize the South Fork McKenzie River as juvenile and sub-adult rearing and foraging habitat, and adult foraging habitat. Recent monitoring of the South Fork McKenzie bull trout population (Tranquilli et. al 2003) find the population is very low in number, estimated at 50-75 adults, and considered at high risk of extinction (Buchanan et. al 1997).

Completed in 1963 by Army Corps of Engineers, Cougar Dam was built primarily as a flood control project. The dam also serves as a hydroelectric project. Cougar dam is located 16 rivermiles downstream of the project area. Six mile long Cougar Reservoir serves as juvenile habitat for spring Chinook salmon and bull trout, and as adult foraging habitat for bull trout. The South Fork McKenzie population of bull trout is isolated upstream of Cougar Dam (separated by the dam from the McKenzie River bull trout population) and has adapted to a lake dwelling adult life history. Distribution of fish in this portion of the basin has changed dramatically over the past 45 years. The range of spring Chinook salmon has been altered with completion of the project. Approximately 25 miles of historic spring Chinook spawning and rearing habitat is no longer accessible in the South Fork McKenzie and Roaring River above Cougar Dam, to about the confluence of Elk Creek.

A run of 2,000 – 4,000 adult spring Chinook is estimated to have historically utilized habitat above Cougar Dam. The McKenzie Salmon Hatchery near Leaburg, Oregon is funded by ACOE as mitigation for loss of habitat and to supplement salmon runs. Loss of salmon migration in this portion of the basin may represent a significant loss of nutrient flow as current research pursues this question. ODFW has trucked adult spring Chinook salmon collected at McKenzie Salmon Hatchery around Cougar Dam since 1993, to restore a natural prey base for bull trout, to restore in-stream nutrients and to supplement natural chinook production (Table 3).

Currently, a permanent trap-and-haul facility is planned by ACOE below Cougar Dam. The facility will reconnect migrating spring Chinook and bull trout (through physical transport of fish collected at the base of Cougar Dam) with the river above the dam. Utilization of naturally produced and migrating spring Chinook and bull trout is expected to benefit South Fork McKenzie specific fish populations and assist in perpetuating local adaptation. The Cougar Dam trap-and-haul facility is expected to be complete in 2009.

Table 3: Summary of Adult Chinook Salmon Collected at McKenzie Salmon Hatchery and Transferred Above Cougar Reservoir by ODFW.

Year	Females	Males	Jacks	Total
1993	33	22	1	56
1994	0	0	0	0
1995	0	0	0	0
1996	68	51	3	122
1997	100	100	0	200
1998	153	165	9	327
1999	180	366	3	549
2000	695	801	10	1506
2001	765	1233	57	2055
2002	2047	2775	56	4878
2003	1374	1758	62	3194
2004	1263	2143	24	3430
2005	387	462	14	863
2006	243	765	10	1018

Currently, a density of LWM is 29 pieces of large wood per mile (>24 inch diameter by 50 foot length) in the enhancement reach. The reach between Homestead Campground and Elk Creek confluence is approximately 8 miles long, and is known rearing habitat for spring Chinook salmon (offspring of adult salmon transported above Cougar Dam) and bull trout. The low volume of sources of flow deflection is known to limit the opportunity for the South Fork channel to migrate laterally and develop off-channel habitats important to bull trout and spring Chinook salmon.

Other fish historically and currently present above Cougar Dam include mountain whitefish (*Prosopium williamsoni*). Mountain whitefish are also common in main stem McKenzie River and Cougar Dam fragments this population.

Native rainbow trout (*Oncorhynchus mykiss*), similar to distribution of whitefish, are river dwelling in South Fork McKenzie River and larger tributaries. ODFW ceased stocking catchable rainbow trout in the South Fork McKenzie River in 1997 to protect native stocks of rainbow, cutthroat and bull trout. The South Fork McKenzie River and tributaries have been protected by artificial fly and lure angling only and catch-and-release regulations since 1997 in an effort to conserve native fish. Native cutthroat trout (*Oncorhynchus clarki clarki*) are the most widely distributed fish in the project area, their range including nearly all perennial streams, rivers and Cougar Reservoir.

Historically, non-native brook trout (*Salvelinus fontinalis*) have been stocked in upper South Fork McKenzie basin lakes and streams. Where brook trout became self-sustaining populations, or where conflicts with native fishes were found, stocking has ceased. Even though there are no locations in the project area that continue to be stocked with brook trout, they are now found naturalized in wilderness lakes. The threat of brook trout hybridization with native bull trout is greatest where brook trout distribution overlaps with bull trout. The risk of brook trout

hybridization with native bull trout is believed low in the South Fork McKenzie watershed as brook trout range appears confined to Three Sisters Wilderness (South Fork McKenzie headwater lakes).

There are no water quality limitations in the mainstem South Fork McKenzie or Roaring River above Cougar Reservoir. Two tributaries to the South Fork McKenzie River are listed as water quality limited for temperature. Within the Hardy Creek/Rebel Creek sub-watershed, an un-named non-spawning tributary of Rebel Creek is 303(d) listed by Oregon Department of Environmental Quality as water quality limited based on water temperature during the summer season. The stream is listed for exceeding the summer temperature criteria of 16 degrees C. for core cold water habitat. Rush Creek, a non-spawning tributary to Cougar Reservoir is 303(d) listed under the same criteria. The South Fork McKenzie River downstream of Cougar Dam is 303(d) listed for exceeding salmon spawning and rearing habitat temperature criteria of 12.8 degrees C (ODEQ 2004-6 listings). The ACOE Temperature Control Project, designed to restore historic temperature regimes in the South Fork McKenzie and McKenzie River began its first year of operation in 2006.

Analysis of drainage area estimates peak flood discharges at Homestead Campground at 1,980 cubic feet per second (cfs) for a 2 year flood event, 3,550 cfs for a 10 year event, 5,070 cfs for a 50 year event, and 5,750 cfs for a 100 year event. The upper South Fork and Roaring River watershed is characterized by a mix of High Cascades and Western Cascades geology (approximately 60% and 40% respectively above Homestead Campground).

In upper South Fork McKenzie River, a large portion of flow is provided by cold, subsurface sources originating from High Cascades geology. High water quality and high elevation combine to provide habitat for specialized aquatic macroinvertebrates. The project occurs near the contact between Western Cascades and High Cascades geology. The Western Cascades are more steeply incised and bound the river to the north and south, and younger High Cascades are lower gradient lava flows that originated from the recent volcanism to the east. The process of debris transport (especially debris torrent) is more common in Western Cascade drainages. This process is important in providing woody material to stream channels and continuing large woody material migration into lower elevation river channels. However, Western Cascade drainages above the project area are often intercepted by roads, and the potential for recruiting large woody material via migration is reduced as a result. Streamside recruitment is generally a more common process of wood supply in High Cascade channels. Once wood has fallen into a channel, stream energy is usually insufficient to transport large-sized material downstream, due to stable spring-fed flows.

The stand of trees adjacent to the South Fork McKenzie and Roaring River restoration reach is described as predominately Douglas fir with a Douglas fir, hemlock and cedar understory. The stand is a multi-layered canopy with an old growth Douglas fir dominant overstory. The understory of the river adjacent stand in the project area is composed of Douglas fir, hemlock and cedar averaging 110 years old and measuring 125 feet tall. The river adjacent stand is considered fully stocked due to the following indicators: 1) Suppression of saplings is occurring with 1-4 inch diameter trees averaging 19 years old. 2) A suppressed rate of growth in all but dominant trees. 3)

A canopy more than 75% closed. 4) A stand density index reflecting a dominant suppressing overstory is inducing mortality in the understory.

Water Quality/Aquatic Resources - Effects

1. Riparian and Aquatic Habitat Quality (Including project effects on available stream shade/stream temperature, ESA species and habitat, sedimentation).

For clarity, effects are described separately under the following elements of water quality/aquatic resources: 1a. - Stream Shade/Stream Temperature; 1b. - ESA Species and Habitat; 1c. - Sedimentation.

1a. Stream Shade/Stream Temperature

Alternatives A as it Responds to the Significant Issue of Water Quality/Aquatic Resources:

Stream Shade and Water Temperature

Direct and Indirect Effects: Project effects on stream shade and water temperature are evaluated at the reach scale (adjacent to the 8.5 mile enhancement reach) as effects would be most perceptible at this scale. Potential direct and indirect effects would be expected at the site specific scale.

The 40 trees identified for providing key features in the project reach are dispersed along both banks of the South Fork McKenzie and Roaring River. The project would utilize .005% of the existing stand greater than 20 inch diameter (40 trees removed from 141 acres adjacent along both banks; approximately 60 trees/acre greater than 20 inch diameter) within 100 feet of the river channel. Utilization of stream adjacent trees would result in a potential reduction of 1.2% of existing shade in the reach. Placing 40 trees in a dispersed fashion in the enhancement reach would maintain the river adjacent stand through minimal modification of stem density and canopy. Calculating the influence of site latitude, critical time of year, height of adjacent vegetation, orientation of stream, stream width, maximum solar angle and changes in available shade, Brown's Model (EPA 1980) demonstrates falling trees in the enhancement reach would not result in a measurable increase in stream temperature. Evaluation of a 1.2% reduction of adjacent shade using Brown's Model calculates potential increases in water temperature through the enhancement reach. Results using the model yield a potential increase of 0.007^{o} Fahrenheit, an immeasurable difference between pre-project and post-treatment condition.

Change in canopy is modeled prior to importation of woody material by helicopter or hand crews. Shade provided by imported tree boles is expected to dampen potential project increase in solar exposure. Utilization of live trees would not adversely change the vegetative composition, age structure, quantity, or vigor of riparian stands. The action alternative includes Best Management Practices (BMP's) that provide for the protection of soil, water and fisheries as required project mitigation. The project provides for the retention of effective stream shading vegetation and adequate levels of large wood in project adjacent Riparian Reserves. Some

increase in riparian down wood will occur with the project. The project would result in a small change in stream adjacent canopy, too small to cause a measurable change in river temperature. Aerial placement of the majority of restoration material would avoid potential disturbance of riparian stands.

Long-term improvement in water temperature due to improved inter-gravel (hyporheic) flow from improved floodplain connectivity and through stored substrates is expected, but at levels too small to measure.

Stream Shade and Water Temperature

Cumulative Effects: The proposed project cumulative effects are evaluated at a larger scale than direct and indirect effects to shade and temperature described above. Project cumulative effects are evaluated at the 5th field watershed scale as past and present actions contributing to water quality limited waters occur at this scale.

Tributaries to the South Fork McKenzie River listed as 303(d) water quality limited for temperature by ODEQ are located downstream of the project area. Tributaries listed as water quality limited are beyond the influence of the proposed action. An immeasurable change in water temperature at the site specific scale would not add incrementally to waters listed as temperature limited at the 5th field watershed scale (the South Fork McKenzie River downstream of Cougar Dam). Cumulatively, the proposed action would not lead to diminishment of water quality.

Alternative B as it Responds to the Significant Issue of Water Quality/Aquatic Resources:

Stream Shade and Water Temperature

Direct and Indirect Effects: No Action effects on stream shade and water temperature are evaluated at the reach scale (adjacent to the 8.5 mile enhancement reach) as effects would be most perceptible at this scale. Potential direct and indirect effects would be expected at the site specific scale.

The No Action Alternative proposes no activities that would create additional risk to water resources. Riparian habitat quality would remain much as they currently exist. Available stream shade and stream temperature would be maintained. The rate of in-stream wood recruitment would depend upon the natural rate of stream adjacent blowdown and deadfall. Recruitment of wood from upstream of the project area (through in-stream migration of material) and shade provided by that material would be expected to remain lower than historic rates due to the interception of migrating wood at intersections of the road network with tributaries. The temperature benefits provided through improved inter-gravel flow through floodplain and stored substrates would not occur.

Stream Shade and Water Temperature

Cumulative Effects:

Cumulatively, no diminishment of water quality is expected with the No Action Alternative.

1b. ESA Listed Aquatic Species (Project effects on bull trout and spring Chinook salmon and their habitat)

Alternative A as it Responds to the Significant Issue of Water Quality/Aquatic Resources:

ESA Aquatic Species and Habitat

Direct and Indirect Effects: Project effects on ESA Aquatic Species and Habitat are evaluated at the reach scale (in the 8.5 mile enhancement reach) as effects would be most perceptible at this scale. Potential direct and indirect effects would be expected at the site specific scale.

Project implementation would likely have an effect upon the fish present in the channel at the time of implementation. Implementation timing would avoid the period adult bull trout and spring Chinook salmon are present in the restoration reach. However, the potential exists to impact juveniles rearing in the reach. The potential for harassment or harm of juvenile listed species is characterized as May Affect, Likely to Adversely Affect (LAA). While the likelihood of a tipped tree or helicopter-placed tree harming a juvenile is slim, a level of risk warrants an LAA assessment. The action alternative as designed is covered by programmatic Biological Opinion. The project meets the Project Design Criteria for Aquatic Habitat Projects described in the USFWS Biological Opinion regarding bull trout (April 11, 2003) and NOAA Fisheries Biological Opinion regarding spring Chinook salmon (February 25, 2003). The project findings are consistent with the findings of both Biological Opinions. An LAA assessment characterizes any enhancement action in which the wetted stream channel is entered or when listed species are present or turbidity is transmitted.

The placement of wood is designed to encourage a mostly straight, single channel to provide varying velocity breaks and allow lateral channel migration to resume in the project area. This would be achieved through increased channel roughness. By importing approximately 35 pieces of LWM per mile, the final density of large woody material would be about 80 pieces per mile in the project area. The South Fork McKenzie River channel, is described as a Rosgen type C3/4 channel, with channel materials dominated by gravels and cobbles, and slope range less than 2%. Type C3/4 channels are typically unconstrained by valley walls and characterized by broad flood plains. In the South Fork McKenzie River, enhancement wood is expected to provide areas of flow refuge of value to rearing spring Chinook salmon and bull trout. As wood placement will not utilize equipment in or near the channel, water quality parameters may be expected to remain high with no evident increase in turbidity. There would be some expected increase in nutrient retention through slower water velocities and the capturing nature of debris accumulations. Nutrient retention would not adversely affect water quality.

Project design may place full channel-spanning structures into the river. Full spanning structures would mimic existing large wood in the channel, but are subject to a greater frequency of migration due to the greater surface area exposed to high flows. Restoration wood would be expected to migrate during an extreme flood event. No artificial attachment would be used, rather imported wood will depend upon the mass and weight of an intact rootmass to stabilize material.

During a typical flow year (1.5 recurrence interval), minimal adjustment and settling of wood accumulations is expected. During high flow events, for example, the November 1996 event estimated at a 50 year recurrence event in the South Fork McKenzie River, 10% of restoration wood similarly placed was found to reposition for a distance of up to 300 feet. Restoring wood to estimated pre-salvage density would not affect the free-flowing character of the river, as natural conditions of flow would be maintained. Water quality would be maintained with enhancement of channel complexity.

Although a short-term adverse affect to listed fish is anticipated, no adverse modification to spring Chinook salmon Critical Habitat is expected as a result of project activities. A long-term beneficial effect to aquatic habitat quality is expected following project activities.

ESA Aquatic Species and Habitat

Cumulative Effects: Project cumulative effects on ESA Aquatic Species and Habitat are evaluated at the reach scale (in the 8.5 mile enhancement reach) as effects would be most perceptible at this scale.

Project implementation addresses cumulative degradation of aquatic habitat. Past management in Riparian Reserves has been found to contribute to loss of side channel area. Current low level of side channel area in the project area is believed outside the range of natural variability. Restoration of side channel area through addition of large woody material is an expected outcome of the proposed action. Improving floodplain connectivity, especially during high flow events, is expected to bring side channel area within the range of natural variability. Aquatic habitat quality is expected to improve following project activities with off-channel habitat area increasing to within the natural range of variability.

Reconnection of the upper South Fork McKenzie and Roaring River through a planned trap-and-haul facility at Cougar Dam would be expected to yield a greater level of ESA species production that reflects improved channel condition, as well as influence of other variables. The rate of production in the project area is dependant upon factors such as adult escapement, climate, occurrence of disturbance events, availability of rearing habitat, food supply, angler harvest, predation and flow regimes.

Alternative B as it Responds to the Significant Issue of Water Quality/Aquatic Resources:

ESA Aquatic Species and Habitat

Direct and Indirect Effects: Project effects on ESA Aquatic Species and Habitat are evaluated at the reach scale (in the 8.5 mile enhancement reach) as effects would be most perceptible at this scale. Potential direct and indirect effects would be expected at the site specific scale.

Factors suppressing the South Fork bull trout population, including habitat degradation, would continue to contribute to a high risk of extinction. Off-channel habitat availability for rearing spring Chinook salmon would remain near current levels. In-stream wood recruitment would depend upon natural rates of input. The rate of in-stream wood recruitment would depend upon the natural rate of stream adjacent blowdown and deadfall. Recruitment of wood from upstream of

the project area (through in-stream migration of material) would be expected to remain lower than historic rates due to the interception of migrating wood at intersections of the road network with tributaries. Channel response to low wood density during flood includes risk of continuing channel abandonment of floodplains and further loss of off-channel habitat.

ESA Aquatic Species and Habitat

Cumulative Effects: Project cumulative effects on ESA Aquatic Species and Habitat are evaluated at the reach scale (in the 8.5 mile enhancement reach) as effects would be most perceptible at this scale.

Channel response to low wood density during flood includes risk of continuing abandonment of floodplains and further loss of off-channel habitat. Reconnection of the upper South Fork McKenzie and Roaring River through a planned trap-and-haul facility at Cougar Dam would be expected to yield a level of ESA species production that reflects current channel condition and influence of other variables. The rate of production in the project area is dependant upon factors such as adult escapement, climate, occurrence of disturbance events, availability of rearing habitat, food supply, angler harvest, predation and flow regimes.

1c. Sedimentation

Alternative A as it Responds to the Significant Issue of Water Quality/Aquatic Resources:

Sedimentation

Direct and Indirect Effects: Since the actual occurrences of soil disturbing activity associated with this are project highly localized to treatment sites that are of limited number and extent, the area of analysis for sedimentation effects will be limited to the project area.

Lining equipment will be required to remain on existing roads and is mounted on rubber tires. It will also be stationary during actual lining operations, so that on native surface roads, traffic is not likely to result in meaningful sediment migration off of the roadway. In addition, the roads that will be used are generally no closer than 300 feet to the river, and are situated on flat, well vegetated terrain that possesses excellent capability to trap sediment. Consequently, increased transport of fine sediment to the river, resulting from equipment operations on gravel and native road surfaces is expected to be negligible.

Small areas of soil disturbance will occur where 40 trees will be uprooted over the 8.5 mile long reach. The trees will be tipped toward the river so that the resulting rootwads face away from the river. Soil and sediment falling from the rootwads will fall into the depression where the tree was uprooted, so that little opportunity for offsite migration of this material will be created. These disturbed sites will be further protected from erosion by placement of duff and litter over exposed soils and seeding with native grass species.

Only currently existing landings that are located 500 to 1000 feet from the river will be utilized by this project for helicopter service landings and material staging, and helicopter placement of imported woody material to the river is not a soil disturbing activity. Consequently,

increased transport of fine sediment to the river, resulting from material staging and helicopter operations is expected to be negligible.

Vehicle traffic would be eliminated on approximately 3000 feet of existing native surface roads that access 12 dispersed recreation sites in close proximity to the river. Management treatments, including boulder placement, berm construction, waterbar construction, and light scarification to prepare a seed bed will result in a short term increase in the risk of fine sediment transport to the river. However, seeding and planting with native plant and tree species will facilitate re-establishment of effective ground cover and rapidly eliminate project induced sedimentation risk. These treatments will also result in a substantial reduction of existing sediment transport from the project area as the 3000 feet of road and portions of the 12 dispersed recreation sites become permanently re-vegetated.

Sedimentation

Cumulative Effects: Since the actual occurrences of soil disturbing activity associated with this are project highly localized to treatment sites that are of limited number and extent, the area of analysis for sedimentation effects will be limited to the project area.

Detailed information about the extent and timing of past management activities that created disturbed soil conditions in the project area are not readily available. However, observation of the project area during this analysis indicated substantial activity over the past 50 to 60 years since management access to the area was established that resulted in disturbance and fine sediment transport to the river. The 3000 feet of road and 12 dispersed recreation sites that are proposed for treatment are a portion of this disturbance legacy. Over this time, fine sediment transport to the river likely fluctuated in proportion to disturbance in the project area, with levels peaking in the 1960's and 1970's when timber harvest and road construction were also peaking. Since then, and especially since implementation of the Willamette Forest Plan in 1990 when the area was established as an allocation where scheduled timber harvest was not permitted, fine sediment transport gradually declined to their current levels which are largely related to the existing, unregulated recreation traffic.

Based on professional experience with the sediment transport capacities of large rivers like the South Fork, it is unlikely that fine sediment has accumulated over the years as an incrementally additive effect. However, disturbance activities in the project area have resulted in a long chronological exposure of the river to these levels of fine sediment input. Alternative A provides treatments that will eliminate and reduce the levels of disturbance associated with unregulated dispersed recreation use of legacy roads and sites. This is likely to result in an additional decline in the amount of fine sediment that is chronically being transported to the river from the project area.

Alternative B as it Responds to the Significant Issue of Water Quality/Aquatic Resources:

Sedimentation

Direct and Indirect Effects: Since the actual occurrences of soil disturbing activity associated with this are project highly localized to treatment sites that are of limited number and extent, the area of analysis for sedimentation effects will be limited to the project area.

The No Action Alternative proposes no soil disturbing activities that could result in increased transport of fine sediment to the river. The reduction of existing sediment transport from 3000 feet of road and portions of the 12 dispersed recreation sites (as they re-vegetate) would not occur.

Sedimentation

Cumulative Effects: Since the actual occurrences of soil disturbing activity associated with this are project highly localized to treatment sites that are of limited number and extent, the area of analysis for sedimentation effects will be limited to the project area.

No Action, will not affect the chronic transport of fine sediment to the river from legacy disturbance and unregulated dispersed recreation use of the project area. Absence of road treatment and associated vehicle containment would present risk of continuing road and site enlargement in flat areas.

Recreation - Affected Environment

Human use in the South Fork McKenzie watershed includes fishing, boating, hiking, and camping. The Willamette National Forest manages four campgrounds with some level of development in the project area: Homestead, Twin Springs, Frissel Crossing and Roaring River Campgrounds with more than 23 individual campsites. Within the project area, an 8.5 mile long river adjacent Riparian Reserve, are located 26 dispersed campsites. Dispersed campsites are accessed by non-system roads built during past salvage operations or user constructed.

The forested slopes along the South Fork McKenzie and Roaring River form an important scenic backdrop to the Aufderheide National Scenic Byway (Road 19). The project area also includes the Oregon State Scenic Waterway designated portion of upper South Fork McKenzie and Roaring River. The South Fork McKenzie Wild and Scenic Study River eligibility (USDA Forest Service 1992) provides through Wild and Scenic Rivers Act for the protection and enhancement of resource values in the river corridor, and allows public use and enjoyment of those resources. Management goals strive for a balance of resource use and protection, and permitting other activities to the extent that they protect and enhance the river's special attributes. Human use in the South Fork McKenzie watershed includes timber production and harvest, as guided by the Willamette Land and Resource Management Plan.

Recreation – Effects

Recreational Opportunity (Project effects on dispersed camping and kayaking)

Alternatives A as it Responds to the Significant Issue of Recreational Opportunity:

Direct and Indirect Effects: Project effects on human use in the area are evaluated at the reach scale (along the 8.5 mile enhancement reach) as effects would be most evident at this scale. Potential direct and indirect effects would be expected at the site specific scale.

Non-system road closures, totaling 3,000 feet in length, in the South Fork Project are designed to meet the demand for a variety of recreation experience along the South Fork McKenzie and Roaring River. Currently a high frequency of dispersed campsite is accessible by vehicle (3.0 sites per mile). Following non-system road closures, 1.6 sites per mile would continue to be accessible by vehicle (14 sites in the project area) and 1.4 sites per mile would be accessible via trail (12 sites in the project area). Change in access would not change the number of established dispersed campsites. A variety of dispersed camping experience may be expected, ranging from those more readily accessible by vehicle to walk-in sites. Modification of improved campgrounds (23 campsites) would not occur in the project area.

On roads selected for blockage, vegetation screens are utilized where possible to allow vehicles to park out of view of Road 19. Road blockage points would be selected to allow a vehicle to remain out of view of those touring on Road 19 (Aufderheide Scenic Byway). This method of road closure is expected to maintain the visual quality of the scenic byway.

A short-term interruption of public use of the project would occur during 4-5 days of project implementation. This interruption would occur during weekdays as no project work would be conducted on holidays or weekends. The timing of interruption would be between July 15 and August 15.

A higher density of in-stream large woody material would modify potential recreational boating (kayaking) use in the enhancement reach. The entire length of the treatment reach (8.5 miles) would be less attractive as a boating destination than current condition. Exploration of the enhancement reach by members of Willamette Kayak and Canoe Club in 1998 found the reach to be low gradient and require too many portages to be considered a quality kayak destination. No modification of the high value kayaking reach beginning near French Pete Campground would be expected from project actions.

Utilization of riparian trees for aquatic enhancement in a dispersed manner would maintain a high level of canopy closure and placement in the river would remain natural in appearance (root mass intact, appearing as a wind thrown tree in the channel). Project activities would maintain the visual characteristics and the high level of scenic quality within the Wild and Scenic River corridor.

Cumulative Effects: Project effects on human use in the area are evaluated at the reach scale (along the 8.5 mile enhancement reach) as effects would be most evident at this scale. Potential direct and indirect effects would be expected at the site specific scale.

Considered in aggregate with past restoration projects, the proposed action may have restorative effects on recreational opportunities such as wildlife viewing and fishing. Restoration of historic channel condition is expected to improve aquatic production in the project area, with benefits to riparian wildlife species. Fishing opportunity would be expected to improve as channel conditions improve in response to multi-year in-stream projects. A moderate road density of about 2.5 miles/square mile in close proximity to the river is expected to continue and provide opportunity for a variety of dispersed camping experience.

Alternative B as it Responds to the Significant Issue of Recreational Opportunity:

Direct and Indirect Effects: Project effects on human use in the area are evaluated at the reach scale (along the 8.5 mile enhancement reach) as effects would be most evident at this scale. Potential direct and indirect effects would be expected at the site specific scale.

There would be no change in recreational opportunity with the No Action alternative. No trees would be pulled over or imported to the project area. Non-system roads contributing to degraded water quality would continue untreated. Interruption of public use of the area associated with project activities would not occur. A small visual improvement (re-vegetation of about 0.8 acre) associated with treatment of road surfaces would not occur.

Cumulative Effects: Project effects on human use in the area are evaluated at the reach scale (along the 8.5 mile enhancement reach) as effects would be most evident at this scale. Potential direct and indirect effects would be expected at the site specific scale.

Considered in aggregate with past events, the No Action alternative may contribute to diminishment of riparian condition. Absence of vehicle containment is expected to lead to expansion of non-system roads and enlargement of dispersed campsite area.

Effects on Other Issues:

3. Threatened, Endangered, and Sensitive Wildlife and Botanical Species

There are no listed Threatened or Endangered plant species on the Willamette National Forest. Other rare plants, often not associated with older forests, are compiled on a Regional Forester's Sensitive Species list for the Willamette National Forest. These species and their habitats are often rare and limited in distribution. The list of species that have potential habitat within the planning area, and results of site-specific, pre-disturbance surveys of proposed activity areas can be found in Appendix D. No sensitive species were located in the planning area.

Threatened, endangered and sensitive wildlife species that occur in the area include the spotted owl, bald eagle, and harlequin duck. Spotted owls nest within the landscape of the project area. Bald eagles forage in the nearby Cougar Reservoir. Harlequin ducks are known to successfully nest in the South Fork McKenzie River.

There would be no effects on TES wildlife with this alternative because removal of a limited number of green trees from the riparian area would not adversely alter the function of the forest habitat for TES species. Supplementation of woody material within the stream channel and on the bank will improve habitat for harlequin ducks by providing more cover and loafing areas. The project may also improve abundance of prey species for foraging bald eagles and harlequin ducks. Potential impacts to harlequin ducks from trees falling on nests would be avoided through seasonal

restrictions (April 1 – June 30) on felling activity. Potential for noise disturbance to spotted owls or peregrine falcons from helicopter and heavy equipment activity would be avoided through restricting that activity between January 1 and July 15.

There would be no negative effects to TES wildlife with a no action alternative. No trees would be pulled over or imported to the site. Noise disturbance from helicopters or heavy equipment would not occur. Benefits to bald eagles and harlequin ducks from aquatic and riparian habitat restoration would be expected to occur.

4. Hydroelectric Operations

The upper extent of Cougar Reservoir is about 14.5 miles downstream of the project area. Between the project area and Cougar Reservoir is a large channel obstruction that acts to filter most large woody material. There is no expected adverse impact to hydroelectric operations at Cougar Project from implementation of the action alternative. Forest Service continues to share in Cougar Reservoir maintenance responsibility (debris sweeps).

5. Visual Quality

Pulling over 40 trees in the Riparian Reserve would not change the texture or character of the visible forested landscape. Trees are selected in a dispersed manner and are not visible from the Scenic Byway corridor. The 40 stream adjacent trees selected for in-stream destination are dispersed over a 141 acre area (riparian area within 100 feet of the channel) and would not be apparent to the casual observer. In-stream wood of restoration origin visible from the unimproved trails would remain natural in appearance as woody material accumulations would mimic natural in-stream accumulations. Visual Quality Objectives of management areas would be maintained.

6. Noxious Weeds

The majority of weed populations found in the project area are located along roadsides and landings. Noxious weeds in the planning area include bull thistle (*Circium vulgare*), Canada thistle (*Circium arvense*), St. John's wort (*Hypericum perforaturm*), tansy rag-wort (*Senecio jacobaea*), Scotch broom (*Cytisus scoparius*), and the new invader species reed Canarygrass (*Phalaris arundinacea*), evergreen blackberry (*Rubus laciniata*), Himalayan blackberry (*Rubus discolor*), spotted knapweed (*Centaurea maculosa*), and diffuse knapweed (*Centaurea diffusa*). Noxious weeds and other invasive non-native plant populations serve as sources for seed dispersal and invasion. Weed seed can be dispersed by air currents, in contaminated road and fill material, vehicle travel, recreation activities, and wildlife movement.

Spotted knapweed is the most serious threat to native plant populations within the watershed. Spotted knapweed has a broad ecological tolerance, prolific growth, and abundant seed production. It is spread primarily by vehicular traffic and has quickly become established along roads of the watershed.

There are no expected impacts to noxious weeds from implementation of the action alternative because prevention measures would be used to minimize expansion of existing populations. Control methods used in the watershed include manual and mechanical removal and the selected use of herbicides. A provision requiring all equipment used in enhancement activity will be

washed prior to moving onto National Forest System lands would be included in project contracts to limit the introduction and distribution of non-native seed and propagules.

7. Soil Erosion

The soils of the project area are generally in good condition. Where past management activities have impacted long-term soil productivity is where temporary roads were constructed. Past management activity in the Riparian Reserve adjacent to the enhancement reach has consisted mostly of road construction and timber salvage. Previous harvest activity consisted of small scale salvage operations, removing downed trees from what is now the Riparian Reserve, and from South Fork McKenzie and Roaring River channels. Previous harvest activities were performed primarily by cable-yarding systems and did not result in adverse erosion, loss of effective ground cover, or slope instability, due to the small scale of salvage operations. The adverse effects of past ground-based yarding systems (compaction, displacement, loss of litter cover) have been minimal and within the Willamette National Forest Plan Standards and Guidelines (1990) within current Riparian Reserve. Degradation of temporary roads where they were intercepted by river or tributary channels, or pass through wetlands is the focus of road treatments in the proposed action. The objective of road treatments is to stabilize soils in those Riparian Reserve locations.

There is little potential for additional impacts to soils in the project area from implementation of the action alternative. Additional soil compaction, erosion, or puddling would not be expected. Ground-disturbing equipment would remain on road surfaces and would be prohibited off-road. Exposed soil would occur in the root system area of pulled trees, resulting in a small area of disturbance in the project area. Disturbed areas will be covered with organic material to minimize mobilization by rain and seeded with native plant seed following completion of the project.

8. Management Indicator Species

Background and Effects Summary: The Willamette Forest Plan has identified a number of terrestrial wildlife species with habitat needs that are representative of other wildlife species with similar habitat requirements for survival and reproduction. These management indicator species (MIS) include spotted owl, bald eagle, peregrine falcon, cavity excavators, pileated woodpecker, deer, elk, and marten. Spotted owls, bald eagles, and peregrine falcons are addressed in a separate Biological Evaluation. The other MIS have potential to occur in or near the project area and are addressed below. Activity associated with the proposed action is consistent with, or exceeds Willamette Forest Plan Standards and Guidelines as they pertain to MIS management.

Project activities could result in disturbance to MIS that may be present in or adjacent to the immediate area. However, any modification or disturbance that may occur associated with this project is not of a scale that would threaten the viability of any MIS to persist within the project area or throughout the range of these species.

Anadromous and resident salmonids (trout and salmon) are considered Management Indicator Species. In the South Fork McKenzie and Roaring River, the MIS are spring Chinook salmon, rainbow trout, bull trout, whitefish, and cutthroat trout. Effects of the proposed action to MIS are similar to impacts to bull trout and spring Chinook salmon. There is potential to harm individuals during the placement of material during project implementation, but impacts to populations of MIS

would be negligible. Over the long term, a benefit to salmonid habitat is expected as a result of the proposed action, with benefit to MIS fish populations.

9. Neotropical Migratory Land Birds

Land bird species exhibit a dramatic response to the height, seral stage, canopy structure, and spatial distribution associated with forest habitat where greater numbers of birds are associated with more complex heterogeneous forested landscapes (Altman 1999). The current amount of forested and open ecotonal habitat characteristic throughout the project area should be attractive for use by a variety of avian species (Gilbert and Allwine 1991). However effects from past management practices – specifically fire suppression – have resulted in simplification of habitat throughout this area.

Effects to Land Birds/Neotropical Migrants: Proposed activities would generally occur outside the breeding season for these species and/or at a time when many may have migrated from the area (Marshall et al. 2003, O'Neil et al. 2001, NatureServe 2005). The timing of activities would mitigate potential short-term (< 5 years) negative effects from habitat modification such as temporary loss of some potential nesting habitat, or disturbance such as temporary displacement of individuals or their prey from prescribed burning activities. The number of individuals and/or species potentially affected by proposed activities is unknown and considered unquantifiable without reliable survey data. Activities proposed by this project should not affect this group of species such that their ability to persist in the vicinity of the project area or throughout their ranges would be compromised.

Project effects to Land Birds/Neotropical Migrants are of no measurable consequence on an individual basis relative to the amount of habitat modified or disturbed against the amount available throughout the surrounding Forest. Project effects would result in negligible overall contribution, with respect to historic habitat and biodiversity, to cumulative effects that have occurred from past actions affecting the project area.

10. Survey and Manage Wildlife and Botanical Species

In 2004, the Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines was released (USDA Forest Service and USDI Bureau of Land Management. 2004a). As a result, some of the species that were formerly Survey and Manage are now managed under the interagency Special Status Species Program (SSSP) as sensitive species. A pre-field review of the project area was conducted to determine the presence of potential habitat for former Survey and Manage species. Surveys were not required for Survey and Manage and Protection Buffer wildlife species red tree vole and Crater Lake tightcoil snail.

Surveys for Survey and Manage plant species were conducted in areas proposed for ground disturbing activities. No Survey and Manage plants were found during these surveys. The list of species that have potential habitat within the planning area and Survey and Manage species located in the project area can be found in Wildlife and Botany Appendices. The absence of Survey and Manage species presence presents little risk or those with potential habitat have a low likelihood of adverse project effect. Modification of habitat or disturbance that may occur associated with this

project is of a scale that would not threaten the viability of Survey and Manage populations or their ability to persist within the project area or throughout their range.

11. Cultural Resources

Before the 1856 Dayton Treaty, west-side Indian tribes (likely ancestors of the Molalla and Kalapuya) used the area. Although there were no resident Indian bands in the South Fork McKenzie drainage at the time of white settlement, a band of Kalapuya Indians lived in a village at the mouth of the McKenzie, near its confluence with the Willamette River. They may have visited or traveled through the area during the summer. However, once they were relocated to the Grand Ronde or Siletz reservations (in the mid to late 1850s), they could not easily get to the area. From 1860 to 1920 bands from the Warm Springs Reservation visited the area, gathering huckleberries, hunting, and grazing ponies in the summer and early fall. The area was also used for sheep grazing at the turn of the century from 1880-1920.

Field surveys for the South Fork McKenzie River Enhancement project did not locate any new cultural sites. However previous surveys did located one historic site (Frissell Crossing) within the project area. This historic site is considered potentially eligible to the National Register of Historic Places (NRHP) and must be protected from project activities or evaluated to determine it's eligibility to the NRHP.

Implementation of Alternatives A and B would not directly nor indirectly affect heritage resources since there would be no change to the integrity of heritage resource sites. The potentially eligible site has been protected through complete avoidance. The District Archeologist would evaluate any subsequent discoveries.

Past Actions and Cumulative Effects

The analysis of cumulative effects considered past, present and reasonably foreseeable future actions on these lands.

The Hartz Project is a timber management/roads treatment project to the west (downstream) of this enhancement project. The thinning project would not increase sources of turbidity or sedimentation downstream of the enhancement reach, as thinning stands and roads are located at sufficient distances from adjacent channels to reduce potential sedimentation. Negligible quantities of sedimentation are expected from the road maintenance activities in the project area, conducted annually. Chronic sources of road related sediment are generated in the South Fork McKenzie 5th field watershed, from a road system near 2.5 miles/square mile. Road densities range from 3.6 miles/square mile downstream (west) of the project area within the Hardy Creek 6th field sub-watershed to less than 1.0 mile/square mile upstream (north) in areas that include Three Sisters Wilderness. The sources of sedimentation generated by the South Fork project would not add measurably to road related sedimentation. Best Management Practices would help mitigate proposed management actions in the watershed.

Past projects in the vicinity of the proposed project include salvage projects. Most are older than 20 years in age. Past in-stream salvage and temporary road effects contributing to degradation of aquatic habitat and water quality are addressed in the proposed action. The

proposed action would decommission approximately 3,000 feet of river adjacent non-system road with an expected beneficial effect to water quality.

Cumulatively, these projects, including the current proposal, would not lead to incremental degradation of aquatic habitat or water quality. Stream shade would be largely maintained and not adversely influenced by the proposed action. Stream adjacent activities would be confined to road surfaces in efforts to maintain water quality.

Army Corps of Engineers reconnection of the upper South Fork McKenzie and Roaring River through a planned trap-and-haul facility at Cougar Dam would be expected to yield a greater level of ESA species production upstream of Cougar Dam. It is difficult to estimate the rate of production in the project area as it is dependant upon factors such as adult escapement, climate, the occurrence of disturbance events, availability of habitat, food supply, angler harvest, predation and flow regimes. When considered independently of other variables, proposed enhancement of habitat for early life history of spring Chinook salmon and bull trout is expected to contribute to conditions favoring survival.

This Environmental Assessment is tiered to the Final Environmental Impact Statement for the Willamette National Forest Land and Resource Management Plan as amended and the analysis of cumulative effects therein.

Compliance with Other Laws, Regulations and Executive Orders

This section describes how the action alternatives comply with applicable State and Federal laws, regulations and policies.

Federal Laws and Executive Orders:

The Preservation of Antiquities Act, June 1906 and the National Historic Preservation Act, October 1966 (amended 1979, 1980, and 1992) – Before project implementation, State Historic Preservation Office consultation is completed under the 1995 Programmatic Agreement among the United States Department of Agriculture, Forest Service, Pacific Northwest Region (Region 6), the Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Officer regarding Cultural Resource Management on National Forests in the State of Oregon, amended June 2004. Field surveys where ground-disturbing activities would occur in the South Fork project area have been completed.

Protection measures resulted in a determination of **No Historic Properties Affected**. Because cultural resources would not be affected by proposed activities under the proposed action, there would be no effect to any historic property listed in, eligible, or potentially eligible to the National Register of Historic Places.

Should previously unknown sites be found during ground disturbing activities, contract provisions would provide protection and the McKenzie River District Archaeologist would be immediately notified.

The Endangered Species Act (ESA), December 1973 – The ESA establishes a policy that all federal agencies would seek to conserve endangered and threatened species of fish, wildlife and

plants. Biological Evaluations for plants and wildlife have been prepared, which describes possible effects of the proposed action on sensitive, and other species of concern that may be present in the project area.

The action alternative as designed is covered by programmatic Biological Opinion for bull trout and spring Chinook salmon. The project meets the Project Design Criteria for Aquatic Habitat Projects described in the USFWS Biological Opinion regarding bull trout (April 11, 2003) and NOAA Fisheries Biological Opinion regarding spring Chinook salmon (February 25, 2003). The project findings are consistent with the findings of both Biological Opinions.

Clean Air Act Amendments, 1977 – The alternatives are designed to meet the National Ambient Air quality standards through avoidance of practices that degrade air quality below health and visibility standards. This project is consistent with by the 1990 Clean Air Act and the 1977 Clean Air Act and its amendments.

The Clean Water Act, 1987 – This act establishes a non-degradation policy for all federally proposed projects. Compliance with the Clean Water Act would be accomplished through application of Best Management Practices (BMPs) and mitigation measures.

Streams in the South Fork Project Area listed by Oregon Department of Environmental Quality as 303(d), as water quality limited based on water temperature during the summer season are located in tributaries to the South Fork McKenzie and the South Fork McKenzie below Cougar Dam, all beyond the influence of project activities.

Magnuson-Stevens Fishery Conservation and Management Act, 1976 (MSA) –The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires the identification of habitat "essential" to conserve and enhance the federal fishery resources that are fished commercially. The Pacific Fishery Management Council (PFMC) designated Essential Fish Habitat (EFH) for Chinook, coho, and Puget Sound pink salmon in Amendment 14 to the Pacific Coast Salmon Plan, issued September 27, 2000. The interim final rule implementing the EFH provision of the MSA (62 FR 66531) requires federal agencies to consult with the NOAA Fisheries Service for any action that may adversely affect EFH. The South Fork McKenzie River channel downstream of Cougar Dam is included in the waters designated as EFH for spring Chinook salmon by the PFMC. The South Fork project area is located upstream of Cougar Dam which does not include waters designated as EFH for spring Chinook salmon by the PFMC. The proposed action is not likely to adversely modify aquatic systems, recreational fisheries, Critical Habitat for spring Chinook salmon or bull trout, or designated Essential Fish Habitat. The effects that are likely to occur are based on sound aquatic conservation and restoration principles for the benefit of recreational fisheries, as directed by Executive Order #12962. Since the project is not likely to adversely affect EFH, no further consultation under the Magnuson-Stevens Fishery Conservation and Management Act is required.

Wild and Scenic Rivers Act, 1968 – This proposal is designed to maintain the Outstandingly Remarkable Values of the South Fork McKenzie River Wild and Scenic Study River (South Fork McKenzie Wild and Scenic Section 7 Analysis; Appendix A).

Inventoried Roadless Areas and Wilderness – There are no actions proposed within Inventoried Roadless Areas (IRAs) or Wildernesses in the South Fork project area, and no actions would affect these designations.

Executive Orders 11988 and 11990: Floodplains and Wetlands – Executive Order 11988 requires government agencies to take actions that reduce the risk of loss due to floods, to minimize the impact of floods on human health and welfare, and to restore and preserve the natural and beneficial values served by floodplains.

Executive Order 11990 requires government agencies to take actions that minimize the destruction, loss, or degradation of wetlands. Project activities located in Riparian Reserves, seeps, springs, and other wet habitats in the South Fork project area are designed to restore floodplain function and recover off-channel habitat. These areas would be managed according to Riparian Reserve Management Guidelines to comply with amended Willamette Forest Plan Standards and Guidelines. Riparian reserves would also be protected with Mitigation Measures also detailed in Chapter 2. As a result, the proposed action is consistent with Executive Orders 11988 and 11990.

Executive Order 12898: Environmental Justice – Executive Order 12898 requires that federal agencies adopt strategies to address environmental justice concerns within the context of agency operations. With implementation of the proposed action or any of the alternatives, there would be no disproportionately high and adverse human health or environmental effects on minority or low-income populations. The actions would occur in a remote area, and nearby communities would mainly be affected by economic impacts connected with contractors implementing tree tipping, road decommissioning, hand crew wood placement and planting, and helicopter wood placement activities. Racial and cultural minority groups could also be prevalent in the work forces that implement project activities. Contracts contain clauses that address worker safety.

Executive Order 12962: Recreational Fishing – The June 7, 1995, Executive Order requires government agencies to strengthen efforts to improve fisheries conservation and provide for more and better recreational fishing opportunities, and to develop a new policy to promote compatibility between the protection of endangered species and recreational fisheries, and to develop a comprehensive Recreational Fishery Resources Conservation Plan.

Executive Order 13186: Neotropical Migratory Birds – There are 85 bird species recognized as neotropical migrants on the Willamette National Forest. Thirty-five of these species found on the Willamette have been identified as species of concern (Sharp 1992). A Memorandum of Understanding was signed between the USFS and USFWS to complement the January 2001, Executive Order. The South Fork Project Area contains populations of migratory landbirds typical of the western Cascades.

The National Environmental Policy Act (NEPA), 1969 – NEPA establishes the format and content requirements of environmental analysis and documentation. Preparation of the South Fork McKenzie River Enhancement Project EA was done in full compliance with these requirements.

The National Forest Management Act (NFMA), 1976 – The proposed action meets the requirement of NFMA by maintaining forest habitats and diversity of plant and animal communities in the long-term. The South Fork Project is designed to remain consistent with

Willamette National Forest Plan guidelines and applicable resource management direction to meet NFMA direction. Proposed activities would comply with the requirements associated with vegetative manipulation (36 CFR 219.27(b)), riparian areas (36 CFR 219.27(e)), water quality (36 CFR 219.27(d)), fish and wildlife (36 CFR 219.19) and soil and water (36 CFR 219.27(f)).

Forest Plan Consistency – Actions analyzed in South Fork project EA are consistent with a broad range of Forest Plan Standards and Guidelines that have been discussed and disclosed throughout the document. Project activities (tree tipping, importing LWM, road treatments) associated with the project are consistent with the goals and management direction analyzed in the Willamette National Forest Land and Resource Management Plan FEIS and Record of Decision. Road treatments that address watershed restoration needs are designed to be consistent with the 1994 Northwest Forest Plan amendments to the Forest Plan and the Aquatic Conservation Strategy objectives.

Other Jurisdictions – There are a number of other agencies responsible for management of resources within the South Fork McKenzie watershed. The Oregon Department of Fish and Wildlife is responsible for management of fish and wildlife populations, whereas the Forest Service manages the habitat for these animals. The Oregon Department of Fish and Wildlife has been contacted regarding this analysis.

Oregon State Scenic Waterway – Segments of the South Fork McKenzie River within this project area are also in portions of the Oregon State Scenic Waterway, which is administered by the Oregon State Parks and Recreation Department. Scenic Waterway Act and Commission rules require the evaluation of proposed development within ¼ mile from each side of the river. Consultation with the Oregon State Parks and Recreation Department about potential effects to the State Scenic Waterway, through Section 7 Analysis will occur prior to project implementation (Appendix A).

Joint permit (Section 404 of Clean Water Act) will be required of fill activities through Oregon Division of State Lands and U.S. Army Corps of Engineers.

Oregon State Forest Worker Safety Codes, The Oregon Occupational Safety and Health Code for Forest Activities would be met with implementation of the proposed action.

Energy Requirements and Conservation Potential – Some form of energy would be necessary for proposed project elements requiring use of mechanized equipment: Tree tipping and aerial placement of in-stream wood would involve heavy machines for moving trees during implementation. Projects such as road treatments could require heavy machinery for a small amount of time. Both possibilities would result in some energy consumption.

Unavoidable Adverse Effects – Implementation of the action alternative, including the No Action alternative, would inevitably result in some adverse environmental effects. The severity of the effects would be minimized by adhering to project design, mitigation measures, Best Management Practices and Standards and Guidelines in Chapter IV of the Willamette Forest Plan. These adverse environmental effects are discussed earlier in Chapter 3.

Irreversible and Irretrievable Effects – “Irreversible" commitment of resources refers to a loss of future options with nonrenewable resources. An "Irretrievable" commitment of resources refers to loss of opportunity due to a particular choice of resource uses.

No new construction of temporary or permanent roads would occur. Temporary use of existing log landings would produce irretrievable changes in the natural appearance of the landscape for the period of wood storage. Boulders used to delineate campsites or block roads would be an irreversible commitment of mineral resources.

Concerning threatened and endangered plant, wildlife, and fish species, a determination has been made that the proposed action would not result in irreversible or irretrievable commitment of resources.

There are no irreversible and irretrievable commitments that would affect heritage resource by implementing the proposed action.

Chapter 4 – Consultation and Coordination

The following Federal, State, and local agencies, tribes and individuals responded to scoping during the development of this environmental assessment:

FEDERAL, STATE, AND LOCAL AGENCIES:

U.S. Army Corps of Engineers; Oregon Department of Fish and Wildlife; McKenzie River Trust; Cooperative project effectiveness monitoring through salmon smolt migration trapping downstream of the project area are being discussed with U.S. Army Corps of Engineers. Oregon Department of Fish and Wildlife, a project co-sponsor plans to continue pre- and post-project spawning surveys of spring Chinook salmon and bull trout in the project area. Bull trout adult population monitoring is expected to continue in the future.

INDIVIDUALS:

Mr. Cole Gardiner of Portland, Oregon provided descriptions of historic condition in the project area.

ID TEAM MEMBERS:

Core team members: Adrienne Launer, Engineering; Burtchell Thomas, Botany; Sam Swetland, Fire; John Harper, Recreation; Cara Kelly, Cultural Resources; Dave Kretzing, Hydrology; Shane Kamrath, Wildlife; Al Brown, NEPA Coordinator; Ruby Seitz, Wildlife; Dave Bickford, Fisheries. Consulting team members: Ray Rivera, Fisheries; Mike Cobb, Hydrology; Phil Raab, Hydropower Coordinator.

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Appendices

Appendix A South Fork McKenzie Wild and Scenic Section 7 Analysis

Appendix B Wildlife Biological Evaluation

Appendix C Wildlife Resource Report

Appendix D Botany Biological Evaluation

Appendix E Botanical Resource Report

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South Fork McKenzie River Wild and Scenic River
Section 7 Analysis

EXECUTIVE SUMMARY

This document summarizes the effects of the proposed South Fork McKenzie Enhancement Project on the South Fork McKenzie and Roaring Rivers, located within the South Fork McKenzie Wild and Scenic Study River corridor, to determine if the project is consistent with Section 7 of the Wild and Scenic Rivers Act.

Wild and Scenic Rivers Act:

The South Fork McKenzie River is a Wild and Scenic Study River (WSR) because it possesses several Outstandingly Remarkable Values (ORV's) such as: prominent recreational opportunities, spectacular scenery, diverse fish populations and prehistoric values. The South Fork McKenzie River has not been designated as a Wild and Scenic River, but was found to be eligible for inclusion in an Eligibility Determination (USDA Forest Service 1992).

For the purpose of classification, the river is divided into three segments. Segment 1 originates in the Three Sisters Wilderness and is classified as "Wild" and ranges from its headwaters to the wilderness boundary. Segment 2 and Segment 3 are paralleled by Forest Road 19 and are classified as "Recreation". Segment 2 ranges from the Three Sisters Wilderness boundary downstream to the head of Cougar Reservoir. Segment 3 is located downstream of Cougar Dam to the South Fork McKenzie confluence with McKenzie River. The proposed enhancement project occurs in the channel and Riparian Reserve of Segment 2 (upstream of Cougar Reservoir) in a recreation emphasis Wild and Scenic reach. Although the South Fork McKenzie has not been designated a Wild and Scenic River, Willamette National Forest plan direction requires it be managed as though it were until its WSR designation is decided. This analysis will examine potential project effects to the Outstandingly Remarkable Values of the Wild and Scenic Study River.

Oregon State Scenic Waterway

The South Fork McKenzie River is designated an Oregon Scenic Waterway. The Oregon Scenic Waterway program is administered by the Oregon State Parks and Recreation Department. Goals of the program include: 1) protecting the free-flowing character of Oregon state rivers that are designated scenic waterways for fish, wildlife and recreation; 2) protect and enhance scenic aesthetic, natural recreation, scientific, and fish and wildlife values along scenic waterways; and 3) encourage other local, state, and

federal agencies to act consistently with the goals of the program. The Oregon State Parks and Recreation Department reviews plans and decisions made by other agencies to ensure consistency with the Scenic Waterway program. The Oregon State Parks and Recreation Department will be involved in evaluation of the South Fork's resources and qualities using Oregon Scenic Waterway standards. Concurrence of project effects to Oregon Scenic Waterway values with Oregon State Parks and Recreation Department will be necessary through Section 7 Wild and Scenic River analysis, prior to project implementation.

SECTION 7 DETERMINATION

Based on the analysis below, it is my finding that the proposed South Fork McKenzie River Enhancement Project is consistent with Section 7 of the Wild and Scenic Rivers Act, and will not have an adverse effect on the values for which the river was authorized by Congress. The project is also consistent with the current Forest Land and Resource Management for the Willamette N.F. and the Record of Decision for Amendments of Land Management Planning Documents Within the Range of the Northern Spotted Owl. It is recognized that there will be short-term effects but that they are at an acceptable level. There will be no long-term adverse effects.

/s/ Mary Allison

Mary Allison
District Ranger

EVALUATION

The process outlined below follows the direction established by the Washington Office in 1994 as a "Procedure to Evaluate Water Resource Projects" (FSM 2354.7). The objective is to establish a uniform and consistent process to determine if projects would affect: 1) the free-flowing characteristics of the river and water quality, or 2) the values for which the river was established Outstandingly Remarkable Values (ORVs). ORVs are resource values that are unique, rare, or exemplary features of the South Fork McKenzie River. The South Fork McKenzie River is recognized for four ORVs: Scenery, Recreation, Prehistoric values, and Fish.

Members of the McKenzie River Ranger District evaluation team:

Dave Kretzing, Hydrology
John Harper, Recreation
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Dave Bickford, Fisheries
Phil Raab, Hydropower Coordinator

1) Establish Need and Evaluate Consistency with Management Goals and Objectives

The primary purpose and need for the South Fork McKenzie River Enhancement Project (South Fork Project) is to provide the means to restore historic conditions over time and to improve aquatic habitat quality for fish. The proposed project meets the objectives of the Willamette Forest Plan as amended by the Northwest Forest Plan. The Willamette National Forest also recognizes the economic need to provide project related employment opportunities.

The proposed action is consistent with Riparian Reserve Standard and Guidelines as it is designed to restore the structure and function of the South Fork McKenzie River and lower Roaring River channel, which is expected to benefit aquatic habitat and biota. Increasing the level of channel complexity will meet Riparian Area/Reserve objectives as the project promotes long-term integrity of river habitat, conserves genetic integrity of native species, and attains Aquatic Conservation Strategy objectives (maintains and restores channel function, bank and bottom configuration, coarse woody debris supply to meet Aquatic Conservation Strategy objective 8).

The proposed action is consistent with and tiered to the 1990 Willamette National Forest Land and Resource Management Plan (LRMP) direction and meets the intent of the 1994 Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (Final SEIS, Record of Decision dated 4/13/94). The project area is located within two LRMP management areas: The South Fork McKenzie Wild and Scenic Study River (MA 6d), and Riparian Area/Reserve (MA 15; and Final SEIS management area designation of Riparian Reserve). This project is consistent with the standards and

guidelines required of all of management areas, with the exception of the following Standard and Guideline from the LRMP: MA-6d-15 states, 100% of the existing streamside shade should be maintained. The utilization of approximately 40 stream-adjacent trees to serve as key features in the South Fork and Roaring River channels will reduce stream shade by 1.2% along the enhancement reach. This small reduction in available stream shade will not result in a measurable increase in stream temperature. This project is located within Critical Spotted Owl Habitat. The proposed project is consistent with the Interagency Scientific Committee Conservation Strategy.

The proposed restoration action is consistent with Forest-wide standard and guideline FW-117 as it is based upon watershed limiting factor analysis. The loss of off-channel habitat and low channel complexity have been attributed to low quantities of in-stream wood and are identified as factors limiting production of native aquatic biota. The LRMP also directs active participation in activities that support bull trout recovery (FW-175).

This portion of the South Fork McKenzie River is designated an Oregon State Scenic Waterway. The proposed action is consistent with State management standards and meets the Oregon Administrative Rules governing resource protection [736-040-0043 (1) (f)] which states "Improvements needed for public recreation use or resource protection may be visible from the river, but must be designed to blend with the natural character of the landscape". Restoration project design will utilize whole trees in river restoration effort, designed to mimic natural woody material accumulations. Where trees are utilized from adjacent riparian areas, those trees are selected in a dispersed fashion to minimize reduction in stream shade and maintain visual quality of the river corridor, and are spread over the length of the 8.5 mile long reach. Native vegetation will provide substantial vegetative screening due to the high density of evergreen and deciduous vegetation remaining along the enhancement reach.

The in-stream restoration project is co-sponsored by Oregon Department of Fish and Wildlife and U.S. Army Corps of Engineers, with the common objective of recovering South Fork McKenzie/Roaring River bull trout and spring Chinook salmon populations. The project must meet approval of Oregon Parks and Recreation Department and Oregon Division of State Lands, both responsible for managing activities in the State Scenic Waterway, Lane County Planning Department, Oregon Department of Fish and Wildlife, and the Natural Resource Conservation District prior to implementation.

Consultation with Oregon Parks and Recreation Department and Oregon Division of State Lands and concurrence is necessary prior to project implementation. Consultation with U.S. Fish and Wildlife (bull trout regulatory agency) and NOAA Fisheries (spring Chinook salmon) will occur through programmatic consultation, as the project will meet project design criteria resulting in a Not Likely to Adversely Affect listed species or not adversely modify Critical Habitat for listed species.

Forest Plan direction requires that this portion of the South Fork McKenzie be managed as if it were officially designated in order to preserve the values that led to its finding of eligibility under the W&SR's Act. The mechanism to make this determination is Section 7(b) of the W&SR's Act. The action agency is required to determine if this project will directly and adversely affect the Scenic, Recreation, Prehistoric, and Fish ORVs present in the area. The effects of this project upon the ORVs of the South Fork McKenzie River are evaluated in this Section 7 assessment. The proposed projects are designed to

enhance the channel function and water quality of the South Fork McKenzie and Roaring River while maintaining the vegetative diversity of stands within the corridor, and must not have an adverse effect on the values of Scenery, Recreation, Prehistoric, and Fish ORVs of the river.

The project area reach located between Homestead Campground and Elk Creek confluence, approximately eight miles long, and lower Roaring River, ½ mile long, is known habitat of two at-risk species above Cougar Dam. Roaring River is used by bull trout as spawning and rearing habitat. Bull trout utilize the South Fork McKenzie River as juvenile and sub-adult rearing and foraging habitat, and adult foraging habitat. Spring Chinook salmon use the South Fork McKenzie and Roaring River as spawning and rearing habitat. Currently adult spring Chinook are transported upstream of Cougar Dam by ODFW. Both species are listed as Threatened and protected by the Endangered Species Act. Recent monitoring of the South Fork McKenzie bull trout population find the population is very low in number, estimated at 50 adults, and considered at high risk of extinction (Buchanan et. al 1997). The treatment reach has been designated Critical Habitat for bull trout and spring Chinook salmon. As a Tier 1 Key Watershed providing habitat for at-risk stocks of spring Chinook salmon and bull trout, this drainage has been identified as a high priority for watershed restoration efforts.

2) Define the Proposed Activity

A need has been identified for channel restoration in the South Fork McKenzie and Roaring River, located within the boundaries of the South Fork McKenzie Wild and Scenic Study River area. The proposed project consists of restoration of large wood to the channels and closure of non-system roads to restore the function of the channel and water quality in the treatment reach. A low density of large woody material (LWM) is present in the South Fork McKenzie and lower Roaring River. The low volume of large wood as flow deflection provides little opportunity for the South Fork channel to migrate laterally and maintain off-channel habitat of importance to rearing listed species. The South Fork Project proposes supplementation of existing woody material, currently at a density of 29 pieces of large wood per mile (>24 inch diameter by 50 foot length), to act as flow deflection to maintain off-channel habitat upstream of Homestead Campground. Desired densities of LWM are approximately 80 pieces of material per mile. Post-project density of large wood would be about 80 pieces of material per mile.

Supplementing the natural rate of large wood input with human placed large wood is designed to provide additional complexity necessary to restore aquatic habitat for bull trout, Chinook salmon, rainbow trout, cutthroat trout and aquatic insects, to nearer historic conditions. The natural rate of input is not sufficient to replace in-stream wood deficits in the foreseeable future (approximately 50 to 100 years with an estimated net recruitment of about one piece/mile/year).

Existing large woody material would be supplemented with approximately 40 trees selected from the adjacent riparian reserve, with imported woody material (280 trees) from nearby upland sources, and through repositioning previously placed restoration LWM. Stream-adjacent trees range in size from 22 to 52 inches in diameter (average 32 inch diameter) and are located from stream bank to 50 feet from the channel. Approximately 14 trees along the north bank, and 26 trees along the south bank would be pulled over into the channel with root mass intact. The large stream adjacent trees are selected for their size and

to serve as key features around which a debris accumulation will be formed. Once key features are in place, the imported wood will be aerially placed using helicopter and hand crews. Material will be added to each key piece of woody material, to mimic natural accumulations. Woody material jams would consist of 4-9 pieces in off-bank accumulations, with numerous opportunities for channel spanning accumulations. Following placement of large wood, channel character will be monitored periodically to determine off-channel development. Periodic aerial photographs and field inventories will be used to quantify off-channel habitat area development. A total of 45 large wood accumulations would be placed in the 8.5 mile long treatment reach, utilizing several existing, natural key wood pieces.

For helicopter access, a service landing is located at the end of Rd 1900-985. Helicopter placed wood, most with their root mass intact, would be flown from staging sites along the South Fork McKenzie River (Figure 1). Placement of woody material by helicopter would occur during one to two days, depending upon weather (6-8 hours of flight time). To ensure public safety, the treatment reach would be closed to public use for 4-5 days during tree-lining and aerial placement of large wood. Seasonal restrictions to protect spotted owl, peregrine falcon, bull trout and spring Chinook will require aerial and in-stream placement occur during July 15-August 15. Hand crew placement of large wood would require implementation during the same in-stream work period. Hand crews may be utilized to reposition smaller woody material placed during 1996 and 1998. Project implementation will occur during the week, to minimize impact to weekend recreation. The project design and contract will include a Flight Safety Plan and Spill Containment Plan, with requirements to ensure contractor safety and spill containment.

The stand of trees adjacent to the South Fork McKenzie and Roaring River restoration reach is described as predominately Douglas fir with a hemlock and cedar understory. The stand is a multi-layered canopy with a Douglas fir old growth dominant overstory. The portion of the river adjacent stand identified for use is composed of a Douglas fir overstory, and understory of Douglas fir, hemlock and cedar averaging 110 years old and measuring 125 feet tall. The stand is considered fully stocked due to the following indicators: 1) Suppression of saplings is occurring with 1-4 inch diameter trees averaging 19 years old. 2) A suppressed rate of growth on all but dominant trees. 3) A canopy more than 75% closed. 4) A stand density index reflecting a dominant suppressing overstory is inducing mortality in the understory.

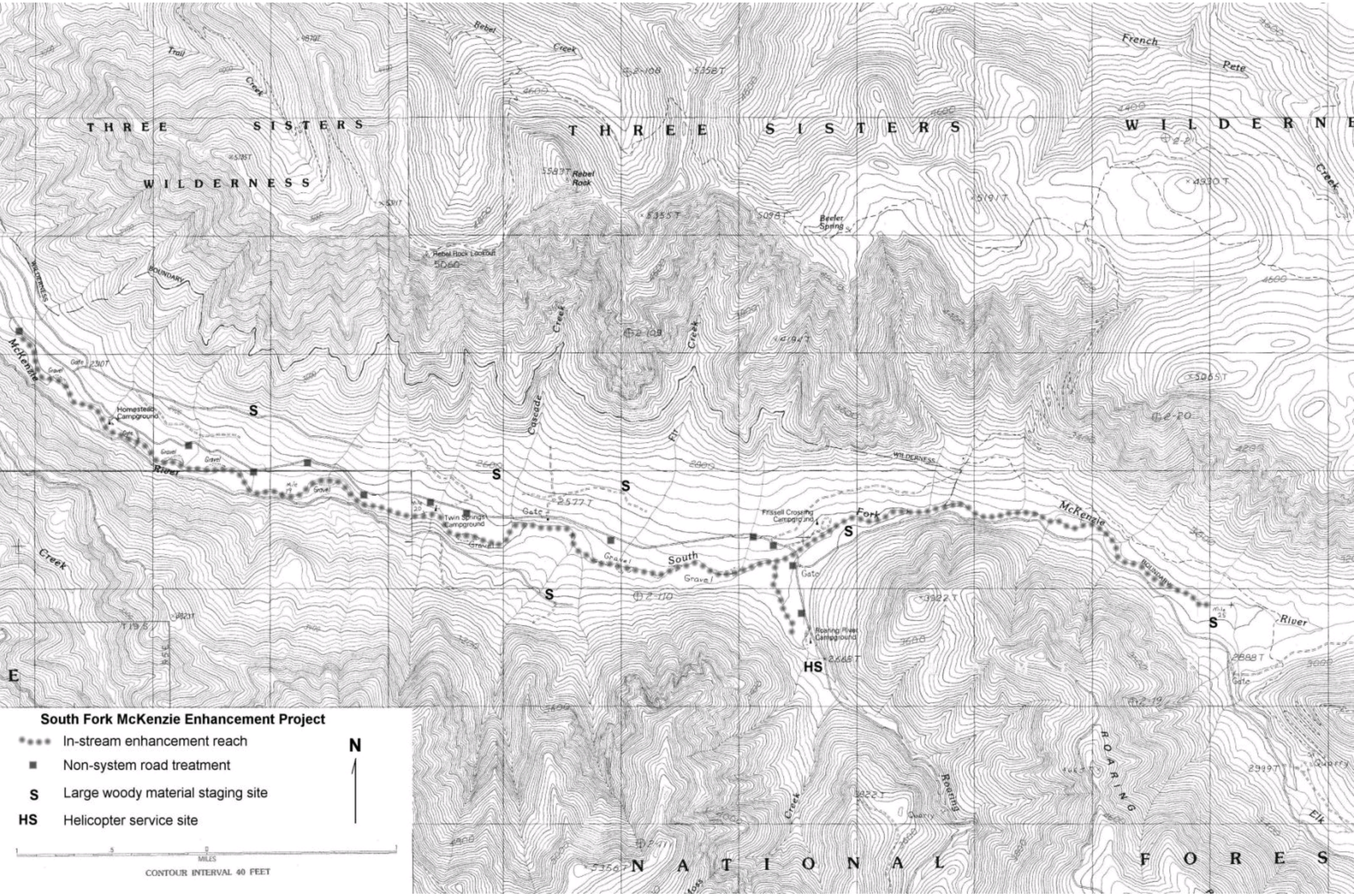
Treatment of 12 non-system, native-surfaced roads through barrier placement or campsite delineation would result in alteration of access to 12 dispersed campsites. Road accesses that travel through the South Fork McKenzie and Roaring River floodplains would be modified to exclude vehicle entry into stream channels and wet areas. There would be no change in access to 14 dispersed campsites, with modification of access to 12 dispersed campsites. The 12 dispersed campsites would continue to exist and be accessible to foot traffic, with vehicle parking available at the road blockage and on native surfacing. Approximately 3,000 feet of road surfaces would be scarified or ripped to prepare the road bed for native seed and plants.

3) Describe How the Proposed Activity Will Directly Alter Within-Channel Conditions.

The placement of wood is designed to enhance conditions in a mostly straight, single channel and restore sources of lateral migration to improve off-channel habitat area. This would be achieved through increased channel roughness provided by greater in-stream wood density. The additional roughness supplied in this project is expected to encourage re-establishment of meander pattern, lost since salvage of in-stream wood during 1960-1984.

The South Fork McKenzie River channel is described as a Rosgen type C3 to C4 channel, with channel materials dominated by cobble and gravel, and slope range less than 2%. Type C3/4 channels are typically unconstrained by valley walls and characterized by broad flood plains. In the case of the South Fork McKenzie River, restoration wood is expected to provide areas of off-channel refuge of value to native salmonid species, particularly rearing bull trout and spring Chinook salmon. As wood placement will not utilize equipment in or near the channel, water quality parameters may be expected to remain high with no increase in turbidity. There would be some expected increase in nutrient retention through slower water velocities and the capturing nature of debris accumulations. Nutrient retention would not adversely affect water quality.

Project design may place full channel-spanning structures into the river. Full spanning structures would mimic existing natural wood in the channel, but are subject to a greater frequency of migration due to the surface area exposed to high flows. Restoration wood would be expected to migrate during an extreme flood event. No artificial attachment will be utilized; rather imported wood will depend upon the mass and weight of an intact rootmass to stabilize material. During a typical flow year (1.5 recurrence interval), minimal adjustment and settling of wood accumulations are expected. During high flow events, for example the November 1996 event - estimated at a 50 year recurrence event in the South Fork McKenzie River, 10% of restoration wood similarly placed was found to reposition for a distance of up to 300 feet. Restoring wood to reflect pre-salvage conditions will not affect the free-flowing character of the river, as natural conditions of flow will be maintained. Water quality will be maintained with restoration of channel complexity.


South Fork McKenzie Enhancement Project
In-stream enhancement reach
Non-system road treatment
S Large woody material staging site
HS Helicopter service site
N
MILES
CONTOUR INTERVAL 40 FEET
THREE SISTERS WILDERNESS
THREE SISTERS WILDERNESS
NATIONAL FORES
Homestead Campground
Twin Springs Campground
Frissell Crossing Campground
Roaring River Campground
Rebel Rock Lookout
Rebel Rock
Beeler Spring
McKenzie
River
South
Fork
Cascade
Creek
Fir
French
Pete
Roaring
Rebel
Elk
Quarry
Gate
Gravel

4) Describe How the Proposed Activity Will Directly Alter Riparian and/or Floodplain Conditions.

In-stream restoration activity would be located within the 100-year floodplain of the South Fork McKenzie River. Material utilized from the riparian area adjacent to the channel will consist of up to 40 live trees pulled over into the South Fork and lower Roaring River. Imported material, most with intact root-mass, will originate from along roads upslope of the South Fork and Roaring River (roadside salvage of wind thrown trees). Utilization of live trees will not measurably change the vegetative composition, age structure, quantity, or vigor of riparian stands. Available stream shade will be reduced by 1.2%, and will not result in measurable increase in stream temperature as simulated using Brown's Model. Densities of downed woody material within the riparian area will not be reduced and will be supplemented due to off-bank placement of LWM. Wildlife values in the Wild and Scenic River will be maintained or improved. The South Fork McKenzie and Roaring River is known nesting habitat for harlequin ducks and addition of downed wood is expected to benefit harlequin nesting habitat.

Placement of wood within South Fork and Roaring River would increase channel roughness. Encouragement of flow of water onto the floodplain with additional roughness is expected to result in floodplain function more closely resembling natural function (as compared to salvaged channel function and current low in-stream wood density). The recent channel straightening documented in the South Fork McKenzie Watershed Analysis reflects a channel response to lower channel roughness resulting from lower density in-stream wood. Following enhancement activity, building of the floodplain through deposition of sediment during flood flows is expected at a rate more approximate of historic conditions. Benefits of restored channel LWM and improved riparian function are expected to provide improved habitat condition for riparian dependent species.

Treatment of 12 non-system roads through barrier placement or campsite delineation would result in reduced vehicle impacts to wet areas and live channels adjacent to the South Fork McKenzie and Roaring River.In the short-term, sources of fine sedimentation and turbidity would be reduced. Active stabilization and natural re-vegetation of road surfaces are expected to restore nearly 1 acre of floodplain vegetation in the project area. Long-term benefits of non-system road closures are restored hydrology, re-establishment of native vegetation and improved water quality.

5) Describe How the Proposed Activity Will Directly Alter Upland Conditions.

For helicopter access, an existing service landing is located along Rd 19-985. Salvaged tree staging sites are located on existing landings on spurs to Rd 19 (Figure 1). All landings used as staging sites or service landing are on existing landings and require no further development. Salvaged wind thrown trees from roadsides in the South Fork McKenzie watershed will serve as the source of material to place in-stream. Road side removal of downed trees occur annually as part of district road maintenance and firewood programs, in this case roadside removal in the South Fork McKenzie watershed would include utilization of road side trees for in-stream enhancement. Trees collected to serve as in-stream wood will be removed from the road prism by self-loading log truck operator. If cultural resources, sensitive wildlife or

botanical resources are found in the project area prior to or during project implementation, the resource(s) will be protected by avoidance of the site. Road surfaces used during project implementation will require equipment operators clean equipment to prevent the introduction of noxious weeds. Post-project mitigation will monitor project used roads and utilize hand pulling to prevent introduction of noxious weeds.

6) Evaluate and Describe How Changes in On-Site Conditions Can/Will Alter Existing Hydrologic or Biologic Processes.

The proposed action of wood addition to South Fork McKenzie and Roaring River is designed to restore channel function. The natural condition of flow would be maintained or enhanced by restoration of pre-management in-stream wood densities. Stream bank erosion potential is expected to reflect natural rates of channel migration, sediment routing and floodplain function. With additional channel roughness, nutrient trapping is expected to improve as fine organic material is caught in wood accumulations, of benefit to aquatic invertebrates. Fish rearing success is expected to improve within the project area in response to improved off-channel habitat. A variety of low velocity margin areas are expected to benefit rearing salmonids. Habitat for amphibians and macroinvertebrates may be expected to improve by increasing channel complexity in the river. Improvement of habitat for riparian dependent species is an expected benefit of restoration of riparian function. Wildlife values will be maintained throughout the Wild and Scenic corridor.

Treatment of 12 non-system roads through barrier placement or campsite delineation would result in reduced vehicle impacts to wet areas and live channels adjacent to the South Fork McKenzie and Roaring River. Active stabilization and natural re-vegetation of road surfaces are expected to restore nearly 1 acre of floodplain vegetation in the project area. Long-term benefits of non-system road closures are restored hydrology, re-establishment of native vegetation and improved water quality. Aggregate Recovery Percent (ARP) is a measure of the vegetative condition related to its ability to intercept rain, snow and wind. Proposed restoration activity will maintain or exceed ARP midpoints prescribed in the Willamette Forest Plan. No adverse alteration of hydrologic processes would occur with the South Fork Project.

7) Estimate the Magnitude and Spatial Extent of Potential Off-Site Changes.

There is potential for some restoration material to migrate downstream and redeposit. Use of larger material and project design seek to stabilize LWM in the river. Results of monitoring in the South Fork McKenzie River by OSU in 1996 and 1998 and in Quartz Creek following the floods of 1996 (Gregory and Wildman 1999) indicate a portion of material migrates a short distance in response to a 50-year or larger recurrence event. Approximately 10% of unattached woody material placed during 1996 and 1998 in the South Fork McKenzie River migrated up to 300 feet from its original position in response to flood flows. Larger sized material placed in this effort is expected to be stable due to placement design, namely through the utilization of key features as a structure backbone. Placement design would utilize off-bank structures and will stabilize material by use of off-bank cinches or binds within river adjacent vegetation. Use of larger sized material with root-masses will provide greater stability and resistance to migration

during high flows. The intent of this design is to mimic natural off-bank recruitment and avoid exposure of restoration wood to the full force of bankfull flow and subsequent migration. Some material migration to lower river reaches is expected to occur due to increased densities of LWM in the river. A large bedrock obstruction near river mile 18, about 2 miles downstream of the project area has effectively captured and retained nearly all LWM migrating to that point in the river. Entire project migration is not expected in any but the most extreme events.

8) Define the Time Scale Over Which Steps 3 - 7 are Likely to Occur.

Following restoration of LWM volumes, channel response is expected to occur following events exceeding bankfull flow (>1.5 year recurrence interval). Recovery and maintenance of channel health is expected to continue for centuries with continued natural debris recruitment.

The beneficial effects of placement of wood in the South Fork McKenzie and Roaring River may be partially realized immediately following implementation and is expected to be fully realized and persist for centuries with replenishment of human-placed debris by natural input. Addition of large wood in the South Fork Project is designed to provide channel complexity and low velocity habitat for a variety of fish species and other aquatic organisms for many years. The longevity of human-placed wood will provide habitat benefits for as long as in-stream wood remains sound, approximately 50-100 years. The duration of time that placed wood occupies the enhancement reach will depend upon flood frequency and decay rates. Flood events in excess of 50-year recurrence interval (approximately 5,070 cfs at Homestead Campground) may be expected to reposition or transport some portion of restoration material. Margin water alcoves and off-channel habitat are expected to be developed during high flow events with return intervals of 10 years or greater (approximately 3,550 cfs at Homestead Campground). Immediately following placement of LWM, cover and attachment sites will be provided for the aquatic organisms. An immediate and continuing benefit of in-stream wood presence and decay will be as a source of cover and nourishment for macro-invertebrates. Shortly after placement, scour of pools and deflection of flows through dissipation of river energy may begin (> 1.5 year recurrence; about 1, 950 cfs at Homestead Campground).

Treatment of 12 non-system roads through barrier placement or campsite delineation is expected to result in reduced sources of sedimentation and turbidity in a short period (immediately following exclusion of vehicles from wet areas/channels) and continuously following stabilization of road surfaces with native seed (within one year).

9) Compare Project Analyses to Management Goals and Objectives

The Forest Plan established Management Area 6d which includes the South Fork McKenzie Wild and Scenic Study River. All MA-6d Standards and Guidelines apply to the proposed activity, with the Standards and Guidelines listed below specifically related to the proposed activity. Riparian Area Standards and Guidelines (MA-15) apply to the riparian areas within MA-6d, as amended by the Northwest Forest Plan.

MA-6d-07 All design and implementation practices should be modified as necessary to meet the Visual Quality Objectives of Retention and Partial Retention as prescribed on the viewshed map for the river corridor.
The goal of management within the Wild and Scenic River corridor is to create and maintain desired visual characteristics of the forest landscape through time and space. The enhancement reach along the South Fork McKenzie and Roaring River will be managed for a high level of scenic quality. Utilization of riparian trees for aquatic restoration in a dispersed manner will maintain a high level of canopy closure and placement in the river will remain natural in appearance (root mass intact, appearing as a wind thrown tree in the channel).

MA-6d-09 The total area of cumulative detrimental soil conditions should not exceed 10% of the total acreage within the activity area, including roads and landings. Severely burned areas should not exceed 3% of an activity area. Detrimental soil conditions include compaction, displacement, puddling, and severely burned soil layers.
Non-system road closures contained in the South Fork Project are designed to address road problems of compaction, erosion, puddling, and interception of live waterways. Closure of non-system roads is expected to reduce cumulative detrimental soil conditions, particularly those leading to degradation of water quality. Temporary roads will not be constructed within the Wild and Scenic River Study corridor with implementation of the South Fork Project. Restoration material placement systems will utilize helicopter, hand crews and cable yarding systems to minimize potential impacts within the Wild and Scenic corridor. Ground based equipment utilized in restoration activities will remain on existing road surfaces. No heavy equipment will be utilized off of roads to avoid soil compaction, displacement, and puddling potentially caused by equipment. Placement of large woody material will be accomplished by means selected to avoid impacts to sensitive riparian areas. Detrimental soil conditions would not be caused by enhancement activity.

FW-313 Road closures or access restrictions shall consider the effects on developed and dispersed recreation sites and trailheads. Proposed access restrictions will consider season of use, alternative routes, and availability of similar experiences.
Non-system road closures contained in the South Fork Project are designed to meet the demand for a variety of recreation experience along the South Fork McKenzie and Roaring River. Currently a high frequency of dispersed campsite is accessible by road (3.0 sites per mile). Following non-system road closures, 1.6 sites per mile would be accessible by road (14 sites in the project area) and 1.4 sites per mile would be accessible by trail. Change in access would not change the number of established dispersed campsites. A greater variety of dispersed camping experience may be expected, ranging from those more readily accessible by vehicle to walk-in sites.

FW-316 Temporary roads left from past activities should be evaluated as they are encountered during project environmental analysis and rehabilitated as soon as practicable.

Non-system roads treated during the South Fork Project are temporary roads remaining from salvage efforts during 1960-1984. Those roads contributing to diminished water quality (crossing wetlands and live waterways) would be decommissioned. Other temporary roads from this period will be retained to provide access to dispersed campsites and to continue a variety of recreational access in the Wild and Scenic River corridor.

MA-6d-15 100% of the existing streamside shade should be maintained.
Restoration activity along the South Fork and Roaring River would influence streamside shade resulting in a 1.2% reduction in existing shade. Results using shade modeling (EPA 1980, Brown's Model) yield a potential increase in stream temperature of 0.007°F, an immeasurable difference between pre-project and post-treatment condition.

MA-6d-28 Management activities shall consider the habitat requirements of ecological indicators for mature and old-growth forests.
The proposed project will meet the Standards and Guidelines provided in the Willamette National Forest Plan as amended by the Northwest Forest Plan. Additional guidance provided by the Endangered Species Act was used in project design and is described in project environmental analyses.

MA-6d-33 New in-stream structures should be limited. Existing structures as well as new structures and activities associated with fisheries enhancement work may be allowed, providing the waterway remains generally natural in appearance and stream flows are not inhibited.
Placement of woody material in the South Fork Project is designed to restore quantities of naturally occurring material to aid in recovery of ESA listed spring Chinook and bull trout. Restoration activity would use native materials and mimic existing structure in seeking natural appearance. Attachments such as cable or other devices would not be used. The placement of restoration wood would not impede or inhibit stream flow, and the material would function as natural in-stream material once placed.

Protection and enhancement of ORVs and special attributes (Scenic, Recreation, Prehistoric, Fish and free-flowing condition) is a management goal for the South Fork McKenzie Wild and Scenic Study River. Previous sections detail the enhancement aspects of this proposal. They can be summarized as follows: The project is consistent with Northwest Forest Plan objectives in restoring habitat for at-risk salmonids. Restoration is also expected to enhance riparian function and provide benefit to riparian dependent wildlife. Native vegetation would provide substantial vegetative screening due to the high density of evergreen and deciduous vegetation along the enhancement reach. Although reduction of stream adjacent shade would occur along the reach, the magnitude of effect is small with no measurable influence on stream temperature. The aesthetic value of the Wild and Scenic Study River would be maintained by providing restoration material that is natural in appearance. The casual observer will not be able to distinguish woody material accumulations from naturally occurring accumulations. Restoration is also expected to enhance riparian function and provide some benefit to riparian dependent wildlife. No

temporary roads would be constructed within the Wild and Scenic River corridor or project area. No alteration of South Fork McKenzie or Roaring River flow would occur as a result of this project.

Findings on effects of the proposed project upon ORV's of the South Fork McKenzie River:

1. Scenic values. The scenic qualities of the South Fork McKenzie River are seen from Aufderheide National Scenic Byway (Road 19), campsites, forest roads, and user trails. Views of the channel from Rd. 19 (north side of the South Fork) are intermittent, when the Byway closely approaches the channel. The majority of the view toward the river from Rd. 19 is screened by vegetation. The view of the river is not continuous along an intermittent un-maintained trail, located on the north side of the river, which varies in distance to the channel from the bank to screened locations away from the river.
The aesthetic value of the Wild and Scenic River corridor would be maintained by providing enhancement material that is only natural in appearance. No form of attachment or cabling will be utilized to stabilize the large woody material. Native vegetation will provide substantial vegetative screening due to the high density of evergreen and deciduous vegetation along the enhancement reach. The majority of restoration material would be imported from outside the Wild and Scenic corridor. Woody material accumulations will be designed to mimic existing accumulations in the South Fork McKenzie and Roaring River corridor. Storage of wood prior to placement will be on established landings that will be out of sight of Wild and Scenic corridor users. The project would not adversely impact the ORV of scenery.

2. Recreation. Recreationists seek a wide variety of recreational experiences use the river corridor in the project area; these include developed and dispersed camping, recreational driving, fishing, and bicycling and hiking. Kayaking and rafting segments of the South Fork McKenzie River occur in segments of river downstream of the enhancement reach. Exploratory kayak use of the enhancement reach has been documented. Willamette Kayak and Canoe Club members conducted boating examination following a restoration project in 1996-8. The treatment reach was deemed to have a low gradient and too many portages to be a high quality kayak experience. A high quality kayaking destination has been documented in Soggy Sneakers (Willamette Kayak and Canoe Club Guide to Oregon Rivers) and begins on the South Fork McKenzie River at Rd 1980 bridge near French Pete Campground. This kayak put-in (starting point) lies 8.0 miles downstream of the project area and 6.2 miles downstream of a large channel obstruction that captures and retains most migrating large woody material.

Enhancement is expected to improve riparian function and provide some benefit to riparian dependent wildlife. Harlequin ducks are known to utilize this portion of the McKenzie River as nesting and rearing habitat. Downed wood within riparian areas is utilized by nesting Harlequins. Similarly, wildlife such as mergansers, water ouzel, herons, river otter, and mink that prey upon aquatic organisms, may be expected to benefit from improvement in rearing fish habitat and aquatic insect production. As a result, enhancement of this portion of the Wild and Scenic River may provide greater opportunities for wildlife viewing. Some short-term interference with area road use, camping, angling and trail recreation would

occur with project activity during 4-5 days of tree-lining and aerial placement of restoration material. Nearby trails, roads and dispersed campsites would be closed temporarily for protection of the public. Beyond a short-term interruption of recreational use in the project area, restoration effort would not have long lasting direct or adverse effects upon recreational values of the South Fork McKenzie Wild and Scenic Study River.

3. Prehistoric. Periodic changes in channel location following material placement are expected to result in variations of channel characteristics such as thalweg position, pool frequency, off-channel habitat, and gravel deposition. Post-enhancement changes in channel location are expected to more closely resemble a properly functioning Rosgen Type C channel. South Fork McKenzie and Roaring River channel and floodplain function is not expected to affect cultural resources beyond the natural rate of channel migration. Identification of sites of cultural or historic importance was accomplished through field surveys and review of known sites. Avoidance of sites will be used to remove potential impacts to prehistoric values. Sites potentially identified during project implementation will be avoided and described to the District Cultural Resource Specialist. This project would not directly and adversely affect Prehistoric resources.

4. Fish. Water quality parameters may be expected to improve, such as increased nutrient retention in woody material accumulations and an increase in depositional areas through project implementation. Improved floodplain/channel interaction is expected to more naturally process migrating organic and inorganic material. Potential to introduce fine sediments through utilization of stream adjacent riparian trees will be mitigated with scattering duff and litter over bare soils and seeding with native grasses. Utilization of stream adjacent trees would result in a reduction of 1.2% of existing shade in the restoration reach. Calculating the influence of site latitude, critical time of year, height of adjacent vegetation, orientation of stream, stream width, maximum solar angle and changes in available shade, Brown's Model (EPA 1980) demonstrates falling trees in the restoration reach will not result in increases in stream temperature. A reduction of 1.2% of existing stream adjacent shade is evaluated using Brown's Model to calculate potential increases in water temperature through the restoration reach. Results using the model yield a potential increase of 0.007o Fahrenheit, an immeasurable difference between pre-project and post-treatment condition.

No adverse effects to water quality are expected to result from this project. Benefits are expected from an increase in large woody material, particularly increases in rearing habitat area, and improved function of floodplain and adjacent riparian areas of the South Fork McKenzie and Roaring River. Project design seeks to minimize migration of enhancement material through use of large sized material with root-mass intact. The in-stream work period of mid-July to mid-August would minimize potential impacts to at-risk species present in treatment reaches (timed to avoid adult spring chinook and adult bull trout presence). There is some potential to disturb juvenile spring chinook and bull trout with placement of woody material. Since a portion of the material would be fallen from the adjacent Riparian Reserve and the majority placed aerially, the possibility of disturbing listed juvenile fish will be of short duration,

during the 4-5 days of project implementation. Alteration of aquatic habitat qualities will occur, and are expected to remain within the range of proper channel and floodplain function. Restored habitat conditions are expected to enhance fisheries resources. While there is some potential to disturb fish in the short-term, this project is expected to beneficially affect fish resources over the long term.

Other values:

Wildlife: Restoration material sources and material placement are factors that could affect wildlife resources in the Wild and Scenic River. As mentioned previously, enhancement is expected to improve riparian function and provide some benefit to riparian dependent wildlife. Harlequin ducks are known to utilize this portion of the McKenzie River as nesting and rearing habitat, utilizing downed wood within riparian areas. Wildlife such as mergansers, water ouzel, herons, river otter, and mink that prey upon aquatic organisms, may be expected to benefit from improvement in rearing fish habitat and aquatic insect production.

Ground disturbance would be mitigated to insignificant levels from utilizing stream adjacent trees in restoration. No ground disturbance will occur as a result of helicopter or hand placement of material. Placement of material by helicopter will meet wildlife operational period specifications. Habitat of value to at-risk species will be identified during field surveys and will be avoided during project implementation. This project would not diminish wildlife resources.

Botanical: Identification of botanical resources was accomplished during environmental analysis. All botanical resource sites such as C-3 Survey and Manage species have been identified and will be avoided by this project. Sites potentially identified during project implementation will be avoided. This project will not directly or adversely affect Botanical resources.

10) Section 7 Determination.

The free-flowing condition of the South Fork McKenzie River would be maintained with implementation of the proposed activity. Enhancement of wood to nearer historic conditions will maintain the natural flowing condition of the Wild and Scenic Study River. No adverse effects upon the free-flowing condition of the South Fork McKenzie Wild and Scenic Study River would occur with implementation of this project. Diminishment of Scenic, Recreation, Prehistoric, or Fisheries values associated with project activities would not occur within, above or below the enhancement area.

Effects Upon Study River Outstandingly Remarkable Values:

	Scenic	Recreation	Prehistoric	Fish
Alt A Action	*No Effect*	*Short Term Interruption (4-5 day closure of sites in the vicinity of project activity)*	*No Effect*	*Potential Short-Term Disturbance, Long-Term Benefit*
Alt B No Action	*No Effect*	*No Effect*	*No Effect*	*No Effect*

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File Code:	2670 T, E, and S species	**Date:**	27 October 2006
Route To:	Project File		
Subject:	Terrestrial Fauna Biological Evaluation (BE) for South Fork Mckenzie Enhancement and Protection Project		

SUMMARY OF DETERMINATIONS

Determinations:

The following summarizes effect or impact determinations to species currently listed as threatened, endangered, or sensitive (TES) that may have suitable habitat identified, and have either documented or suspected occurrence within the project area. **There are no recognized effects or impacts to TES species from No Action.**

Activities associated with the proposed project **may affect, but are not likely to adversely affect** the following federally listed threatened species:

- **Northern Spotted Owl**

Activities associated with the proposed project should have **no impact** on individuals of the following regionally listed sensitive species or their habitat:

- **Peregrine Falcon**
- **Wolverine**
- **Pacific Fringe-tailed Bat**
- **Crater Lake Tightcoil**
- **Harlequin Duck**

Cumulative effects of this project in conjunction with other reasonably foreseeable projects in and adjacent to the project area are not expected to jeopardize the continued existence of any TES species as a result of modification of their essential habitat; nor would they likely contribute to a trend towards Federal listing or cause a loss of viability to populations of species designated as R-6 Sensitive or as Management Indicator Species on the Willamette National Forest. Maintenance and/or recovery of late successional habitat serving as current or potential dispersal corridors surrounding the project area will ensure ongoing opportunities for occupancy and movement of terrestrial TES wildlife species that may occur in the vicinity of this project and are dependent on such habitat.

SUMMARY OF SEASONAL RESTRICTIONS/RECOMMENDATIONS

Implementing the following recommendations would ensure effects or impacts on listed species from proposed activities would be no greater than those addressed in this document, and also would mitigate those impacts.

<u>Spotted Owl</u>

- Impose seasonal restriction on activities associated with project that generate above-ambient noise levels during the spotted owl critical nesting period between March 1 and July 15.

<u>Pacific Fringe-tailed Bat</u>

- Protect decadent trees and snags >12”dbh (roosting habitat) adjacent to the project area to the greatest extent feasible while conducting restoration activities.

<u>Peregrine Falcon</u>

- Seasonal restriction on activities associated with project that generate above-ambient noise levels during the nesting period between January 1 – July 15.

Harlequin Duck

- Seasonal restriction on activities associated with project during the nesting period between April 1 – June 30.

Introduction

This document addresses potential effects to proposed, threatened, endangered or sensitive (TES) fauna listed in the Region 6 Regional Forester's Federally Listed or Proposed, and Sensitive Species Lists (dated July 21, 2004) with documented or suspected occurrences on the Willamette National Forest from activities associated with a habitat restoration project. Biological evaluations of the potential effects to threatened, endangered and sensitive fish and flora are in separate documents prepared by this project's Fish Biologist and Botanist. This evaluation, required by the Interagency Cooperative Regulations (Federal Register, January 4, 1978), ensures compliance with the provisions of the Endangered Species Act (ESA) of 1973, P.L. 93-205 (87Stat. 884), as amended. A review of potential effects to non-TES wildlife species from this project proposal is presented in a separate Wildlife Specialist Report.

Project Location and Description

Alternatives:

The South Fork Mckenzie Enhancement and Protection Project will be analyzed in an Environmental Analysis that reviews two alternatives – an action Alternative and a No Action alternative.

Action Alternative: The influence of proposed activities on terrestrial wildlife is considered in the context of whether or not suitable habitat may be modified or if a species may be present at or near sites where physical disturbance may occur, or be sensitive to and thereby influenced by anthropogenic activities occurring during implementation of this project. Habitat disturbance that may affect some terrestrial TES species could occur as a result of this project. That potential is addressed later in this BE.

No Action Alternative: There is no rationale to suggest the No Action alternative would affect or impact any terrestrial TES species based on current habitat conditions in the project area and ecological requirements of these listed species. Considering the No Action Alternative would have no effect/impact on TES terrestrial wildlife species is based on the following assumption - taking no action would not affect current habitat or wildlife species that may be present as either evolves without human management. The dynamic nature of habitat suitability that may be subject to an unknown frequency and variety of stochastic events is considered beyond the scope of this evaluation. Only potential effects or impacts of the Action Alternative will be discussed further in this document.

Watershed Analysis / Additional Document Support

Proposed activities respond positively to recommendations made to address fisheries resources in the South Fork McKenzie River (USDA 1994a) Watershed Analysis.

Management Direction Compliance

The alternative selected for management of the Willamette National Forest includes a strategy that provides Management Requirements (MRs) exceeding the minimum MRs established for Management Indicator Species (MIS) as presented in the Willamette Forest Plan FEIS Appendices - Volume 1 (USDA 1990, pp B-79 through 82). Maintenance of the MRs ensures the viability of MIS and the species they represent. The MRs have been further enhanced for most MIS species (i.e. those species

dependent on old growth and mature conifer habitat, and dead and defective tree habitat) under the Forest Plan S&Gs as amended by the Northwest Forest Plan.

Proposed action associated with this enhancement and protection project complies with current Standards and Guidelines (S&Gs) pertaining to MIS management, including those MIS species also listed as threatened, endangered, or sensitive. This proposal also complies with other S&Gs established in the Willamette National Forest Land and Resource Management Plan (1990) as amended by the Northwest Forest Plan Records of Decision (ROD) (1994, 2001, and 2004).

TES SPECIES – REVIEW AND ASSESSMENT

The Biological Evaluation (BE) is a 6-step process that identifies known or suspected threatened, endangered, and sensitive (TES) or Proposed wildlife species that may be associated with a project area, and evaluates impacts the project may have to those species. The six steps are as follows:

1. Prefield review of existing information.
2. Field reconnaissance of the project area to document evidence of a species or habitat.
3. Assessment of whether known or suspected populations of TES or Proposed species will be affected by the project.
4. Analysis of the significance of the project's effects on local and entire populations of TES or Proposed species.
5. If step 4 cannot be completed due to lack of information, a biological investigation is done.*
6. Conferencing or informal/formal consultation with the U.S. Fish & Wildlife Service (USFWS) is initiated at appropriate stage as outlined in FSM 2673.2-1, or is otherwise arranged through formal channels.

* Step 5 pertains only to listed species and will not be indicated except when applicable.

A summary of ecological requirements for Federally listed[1] or proposed[2] species, and animal species on the Regional Forester's Sensitive Species List[3] for species with documented or suspected occurrence in the the Willamette National Forest is displayed in Table 1.

A summary of the BE process showing **effects determinations**[4] for Federally listed or proposed species, and **impact determinations**[5] for animal species on the Regional Forester's Sensitive Species List for species with known or potential occurrence in the project area is displayed in Table 2.

1 Species listed based on the USDA Forest Service Pacific Northwest Region Federally Listed or Proposed Species list (updated 7/21/04) having documented or suspected occurrence on the Willamette National Forest.

2 When a species is proposed for listing under the Endangered Species Act of 1973 (with amendments), a notice is published in the Federal Register, a daily publication of the Federal Government. The Federal Register is available on the internet at the following site: http://www.access.gpo.gov/nara/nara005.html

3 Species listed based on the USDA Forest Service Regional Forester's Sensitive Animal List (updated 7/21/04) (USDA 2004a,b) having documented or suspected occurrence on the Willamette National Forest.

4 The criteria for effects determinations can be found in the *Endangered Species Act Consultation Handbook: Procedures for Conducting Section 7 Consultations and Conferences* (USFS and NMFS 1998).

5 Impact determinations are required for all species listed under the Regional Forester's Sensitive Species List (Forest Service Manual 2670.32, 2670.5). Direct, indirect, and cumulative effects should be considered. For a discussion of cumulative effects analysis, see the document *Considering Cumulative Effects under the National Environmental Policy Act* (Council on Environmental Quality 1997).

Table 1. Summary of Ecological Requirements for Animal Species on the Regional Forester's Federally Listed and Sensitive Species Lists for species with documented or suspected occurrence on the Willamette National Forest (July 21, 2004).

Species	Habitat
Northern Spotted Owl ***Strix occidentalis*** ***Status: Federally Threatened***	Occur primarily in the interior of older timber stands with structure required for food, cover, nest sites, and protection from weather and predation. Reproductive habitat = forest w/ canopy closure 60 – 80%; multi-layered, multi-species canopy dominated by large overstory trees (> 30"dbh); abundant large trees w/deformities (e.g. large cavities, broken tops, dwarf-mistletoe infections, decadence); abundant large snags/down logs; and sufficient open flying space below the canopy. Foraging habitat = forest w/ > 2 canopy layers; overstory trees > 21" DBH; abundant snags/down wood; and a 60-80% canopy closure. Dispersal habitat = forest w/ > 11" DBH trees and > 40% canopy closure. Numerous sightings and occupied territories recorded on the Mckenzie River RD.
Northern Bald Eagle ***Haliaeetus leucocephalus*** ***Status: Federally Threatened***	Use scattered old-growth conifer trees in proximity to open water near rivers, lakes, and reservoirs with plentiful prey. Feed primarily on fish, but will also eat waterfowl and carrion. On the Mckenzie River RD, they currently nest at Blue River Reservoir, with activity at lakes and reservoirs and foraging along the McKenzie River.
Least Bittern ***Ixobrychus exilis***	Freshwater or brackish marshes with tall vegetation. Stalks through the weeds to find prey. Eats small fish, frogs, insects, small mammals, and sometimes bird eggs and chicks. Nests are small platform of sticks and live or dead vegetation, placed in cattails, bulrushes, or bushes 8-14" above water. No confirmed sightings on the Mckenzie River RD.
Bufflehead ***Bucephala albeola***	Summers on wooded lakes and rivers, winters on lakes and coastal waters. Nesting normally occurs near lakes in tree cavities 5-50 feet high. Dives underwater and eats small mollusks, fish, snail, and crustaceans. Also eats aquatic insects. Winter sightings common along reservoirs, and nesting activity suspected at sites associated with numerous high elevation lakes on the Mckenzie River RD.
Harlequin Duck ***Histrionicus histrionicus***	During nesting (April-June) adults require fast-flowing water with midstream loafing sites nearby, dense shrub or timber/shrub mosaic vegetation on the bank, and an absence of human disturbance. Nest on ground under the shelter of vegetation, rocks, or large woody debris in close proximity to water. Broods prefer low gradient streams with adequate macroinvertebrate abundance. Breeding and foraging known to occur along portions of the Mckenzie River and South fork Mckenzie River.
American Peregrine Falcon ***Falcon peregrinus anatum***	Preferred nesting sites are sheer cliffs 75 ft. or more in height having horizontal ledges or small caves. Foraging is associated with a variety of open and forested habitats, however is most closely associated with riparian settings. Numerous potential nest sites and occupied territories occur on the Mckenzie River RD.
Yellow Rail ***Coturnicops noveboracensis***	Feeds in shallow water, eating snails, insects, and some seeds and grasses. Summers on wet meadows, marshes; winters on grasslands, fields, and coastal marshes. No documented occurrence in potential habitat on Mckenzie River RD.

Black Swift ***Cypseloides niger***	Found near wet cliffs in mountainous regions. Feeds on-the-wing eating flying insects. Nests in small colonies on ledges or mountain crevices associated with waterfalls. There are historical summer records in the Santiam Pass area, Linn County, which suggests breeding in that area..
Baird's Shrew ***Sorex bairdii permiliensis***	Poorly understood but generally considered a non-riparian associate. In 1986 two specimens were trapped from an open Douglas-fir forested area with numerous rotting logs in Polk Co. It has also been trapped on McKenzie River RD in the Mill Creek area and in the Blue River watershed.
Pacific Shrew ***Sorex pacificus cascadensis***	Poorly understood, but considered a riparian associate generally found in moist areas along class III-IV streams with abundant vegetation and down material. Occasionally found in adjacent conifer forest with moist abundant decaying logs and brush. Nests made of grasses, mosses, lichens, or leaves. Feed on slugs, snails, insects, and sometimes vegetation. No known locations on Mckenzie River RD.
Pacific Fisher ***Martes pennanti***	Considered a riparian associate but found in a wide variety of densely forested habitats at low to mid-elevations. Diet consists of small and medium-sized forest mammals (porcupines, snowshoe hares, tree squirrels, mice, and voles most common). Also eat carrion, and will seasonally eat birds, bird eggs, amphibians, fish, and insects. Use ground burrows, tree cavities, witches brooms or other clumped growth, or occasionally bird or small mammal nests as resting sites. Tree cavities are used by most maternal females with young and ground burrows are used mostly in winter. Data suggests they do better in areas with minimized fragmentation of old growth, second-growth, and riparian area and in areas with abundant down and standing woody material important. A few sighting on the Mckenzie River RD.
California Wolverine ***Gulo gulo***	Found primarily in wilderness or remote country where human activity is limited. High elevation areas appear to be preferred in summer, which may effectively separate wolverines and intensive human disturbance in most areas. In winter wolverines may move to lower elevations that are snowbound and/or have very limited human activity. They are capable of foraging widely (30-40 km) on a daily basis, and do not significantly use young, dense stands of timber or clearcuts. The majority of activity occurs in large expanses of scattered mature timber, with some use of ecotonal areas such as small timber pockets, and rocky, broken areas of timbered benches. Heavy use of openings w/ good winter populations of big game, a principal source of carrion which makes up much of the wolverine's diet. They also feed on marmots, snowshoe hares, various rodents, insects, insect larvae, eggs, and berries. A few sightings on the Mckenzie River RD.
Pacific Fringe-tailed Bat ***Myotis thysanodes vespertinu***	Occurs in Oregon, however habitat use is poorly documented. Three captured in 1971 were associated with young coniferous forest. They are known to use caves, mines, rock crevices, and buildings as both day and night roosts. Nothing is known about habits in winter. Diet of moths, leafhoppers, lacewings, daddy-loglegs, crickets, flies, true bugs, and spiders. Occurrence has not been documented on the Mckenzie River RD.
Oregon Slender Salamander ***Batrachoseps wrighti***	Live in forested areas, especially old-growth Douglas-fir and younger stands with abundant downed large logs. They lay their eggs under thick bark, inside a crevice in a log, or in talus. Juveniles and adults live under thick bark, inside partially decayed logs, or in debris piles around the bases of large snags. They also occur in moist talus w/ abundant woody debris. Sightings have been documented at lower elevation sites on Mckenzie River RD.

Cascade Torrent Salamander ***Rhyacotriton cascadae***	Live in very cold, clear springs, seeps, headwater streams, and waterfall splash zones. Forage in moist forests adjacent to these areas. Eggs are laid in rock crevices in seeps. Larve and adults live in gravel or under small cobbles in silt-free, very shallow water that is flowing or seeping. Adults may be found under debris on streambanks or in streamside forests and talus during rainy periods. Limited sightings reported on the Mckenzie River RD.
Foothill Yellow-legged Frog ***Rana boylii***	Live in sections of low-gradient streams with exposed bedrock or rock and gravel substrates. Attach eggs to the bottom of quiet scour-pools or riffles in gentle-gradient streams, often where there is only slight flow from the main river. Hatchlings cling to egg masses initially and then to rocks. Nearest known sightings are on private lands adjacent to the Sweet Home RD to the north. No sightings on the Mckenzie River RD..
Oregon Spotted Frog ***Rana pretiosa***	Favor lakes and slow moving streams associated w/a permanent water source w/ a soft and muddy bottom. A marsh specialist w/strong preference/requirement for warmer waters; more aquatic than other ranids; often found in water or water's edge floating on the surface or resting on aquatic vegetation. Diet is invertebrates caught above and below the surface. Early breeders: egg masses are typically deposited on top of one another in a communal fashion, not attached to vegetation, and deposited in warmer shallow water, making them susceptible to mortality due to freezing or drying. Documented populations on the Mckenzie River RD occurs in the Mink Lake Basin Area.
Northwestern Pond turtle ***Clemmys marmorata marmorata***	Inhabit marshes, sloughs, moderately deep ponds, slow moving portions of creeks and rivers. Observed in altered habitats including reservoirs, abandoned gravel pits, stock ponds, and sewage treatment plants. Occur from sea level to about 1,830 meters. Require basking sites, such as partially submerged logs, vegetation mats, rocks and mud banks, and may even climb a short way onto tree branches that dip into the water. They use uplands for egg laying, overwintering, and dispersal. They may move up to 500 meters and possibly more for overwintering where they burrow into leaf litter or soil. Nest distances from the water course ranges from 3 meters to over 402 meters. Sparse vegetation, usually short grasses or forbs characterize most nesting areas. Limited sightings on the district.
Mardon Skipper ***Polites mardon***	A small, tawny-orange butterfly currently known to exist at seven, small, geographically disjunct areas in Washington, Oregon, and California. In the southern Washington Cascades, the mardon skipper is found in open, fescue grasslands within Ponderosa pine savanna/woodland habitat at elevations ranging from 1900' to 5100'. South Cascade sites vary in size from small, ½ acre or less meadows, to large grassland complexes, and site conditions range from dry, open ridgetops, to areas associated with wetlands or riparian habitats. Within these environments a variety of nectar source plants are important. The short, open stature of native fescue bunchgrass stands allows mardon skippers to access nectar and oviposition plants. There are no known populations of this species on the Mckenzie River RD..
Crater Lake Tightcoil ***Pristiloma arcticum crateris***	Species may be found sparsely distributed throughout Oregon Cascades above 2000' elevation associated with perennially wet environment in mature conifer forests and meadows among vegetation or under rocks and woody debris. Suitable locations within 10 meters of open water generally in areas under snow for extended periods during winter. One documented site on Middle Fork RD along with a few sites on Mt Hood, Deschutes, Umpqua, Winema, and Rouge River National Forests.

Table 2. Biological Evaluation process for Willamette TES (or Proposed) fauna associated with potential effects from South Fork McKenzie Enhancement and Protection Project Action Alternative.

	STEP 1	**STEP 2**	**STEP 3**	**STEP 4**	**STEP 6**
	Prefield Review	*Field Reconn.*	*Risk Assessment*	*Analysis of Significance*	*USFWS Review*
SPECIES	**Habitat Present (B,R,F,D)***	**Occupancy Status**	**Conflicts? Action Alt**	**Effects / Impacts Action Alt**	**Consul-tation? BA[1]/BO[2]**
Northern Spotted Owl ***Strix occidentalis caurina***	B,R,F,D	Assumed Occupied	Potential Conflict	NLAA Seasonal restriction Mar 1-July15	2006/ 2007/2008
Northern Bald Eagle ***Haliaeetus leucocephalus***	F			NE Adjacent to Foraging cooridor	NA
Least Bittern ***Ixobrychus exilis***	No			NI	
Bufflehead ***Bucephala albeola***	No			NI	
Harlequin Duck ***Histrionicus histrionicus***	B	Occupied	No Conflict	NI Seasonal Restriction Apr1 – June 30	
American Peregrine Falcon ***Falcon peregrinus anatum***	F,D	Occupied	No Conflict	NI Seasonal Restriction Jan1-July15	
Yellow Rail ***Coturnicops noveboracensis***	No			NI	
Black Swift ***Cypseloides niger***	No			NI	
Baird's Shrew ***Sorex bairdii permiliensis***	No			NI	
Pacific Shrew ***Sorex pacificus cascadensis***	No			NI	
Wolverine ***Gulo gulo***	F,D	Unknown	No Conflict	NI	
Fisher ***Martes pennanti***	No			NI	
Pacific Fringe-tailed Bat ***M. thysanodes vespertinu***	R,F	Unknown	No Conflict	NI	
OR Slender Salamander ***Batrachoseps wrighti***	No			NI	
Cascade Torrent Salamander ***Rhyacotriton cascadae***	No			NI	
Foothill Yellow-legged Frog ***Rana boylii***	No			NI	
Oregon Spotted Frog ***Rana pretiosa***	No			NI	
Northwestern Pond Turtle ***C. marmorata marmorata***	No			NI	
Mardon Skipper ***Polites mardon***	No			BI	
Crater Lake Tightcoil ***Pristiloma arcticum crateris***	B,R,F,D	Unknown	No Conflict	NI	

* B = breeding (nesting/denning) habitat R = roosting/cover habitat F = foraging habitat D = dispersal habitat

[1] Date of Biological Assessment (BA) Consultation initiated with USFWS
[2] Date Biological Opinion (BO) or Concurrence issued from USFWS
NA = not applicable
NE = **N**o **E**ffect
BE = **B**eneficial **E**ffect
NLAA[a] = May Affect, **N**ot **L**ikely to **A**dversely **A**ffect
LAA[b] = **May** Affect, **L**ikely to **A**dversely **A**ffect
NI = **N**o **I**mpact.
NLCT = May impact individuals or their habitat, but the action will **N**ot **L**ikely **C**ontribute to a **T**rend towards Federal Listing or loss of viability to the population or species.
MCT[c] = May impact individuals or their habitat, with a consequence that the action **M**ay **C**ontribute to a **T**rend towards Federal Listing or a loss of viability to the population or species.
BI = **B**eneficial **I**mpact
a A **NLAA** determination requires *informal consultation* with the U.S. Fish and Wildlife Service.
b For *listed* species, a **LAA** determination requires *formal consultation* with the U.S. Fish and Wildlife Service. For *proposed* species, a LAA determination requires *conferencing* with the U.S. Fish and Wildlife Service (WO Amendment 2600-91-3, Forest Service Manual 2671.45, March 31, 1991).
c A **MCT** determination may require that an Environmental Impact Statement be written.

AFFECTED WILDLIFE – Discussion/Determinations/Recommendations

A discussion of the affects of the proposed project on TES species follows. **If it was determined that suitable habitat for a species does not occur in the proposed project area** (Table 2), **it is concluded that the proposed action would have no potential to effect or impact those listed TES species**, and the species will not be discussed further in this document. **A No Action proposal is expected to have no effect on federally listed threatened, endangered, or proposed species, and is also expected to have no impact on sensitive species identified by the Regional Forester.** References used to support discussion, determinations, and recommendations are listed at the end of this document (Appendix 1).

1) Northern Spotted Owl (*Strix occidentalis caurina*)
Status: Federal: Threatened
State: Threatened
FS R-6: Sensitive, Identified as Management Indicator Species (MIS)

Determination: "may affect, not likely to adversely affect" northern spotted owls, "no effect" on designated critical habitat.

Status Background: It has been reported that in some regards the northern spotted owl is the most studied raptor in the world (Blakesley 2004), yet prior to the early 1970's little was known about this species in the Pacific Northwest. Knowledge and interest quickly accumulated throughout the 1970's and in 1977 management guidelines for spotted owls on public land in Oregon were established. Driven by concerns over habitat loss, the USFWS conducted their first status review of the species in 1982. In 1987 a petition was submitted to list the spotted owl as endangered under the Federal ESA. The USFWS considered listing the species unwarranted at the time, however that decision was later reversed and the owl was officially listed as threatened under the Federal ESA in 1990.

Since that time a DRAFT Recovery Plan was released (USDI 1992), and the Northwest Forest Plan was implemented (1994) and subsequently amended (USDA et al. 2001, 2004) in efforts to most

appropriately manage Federal land within the range of the northern spotted owl with the welfare of this and other late-successional species in mind.

Habitat and Ecology: The northern spotted owl is a species strongly associated with old-growth forests containing a component of large diameter Douglas-fir. These forest stands commonly provide a variety of structural features such as large diameter trees having central cavities, dense canopies with a high level of vertical and horizontal diversity, and an abundance of snags and down logs (Thomas et al. 1990). Stands with all these characteristics provide the best suitable (nesting, roosting, foraging) habitat for spotted owls. However, all of the above characteristics may not need be present for spotted owls to make use of an area as nesting, roosting or foraging habitat. The owl's affinity to old-growth forest types may result from adaptation and niche partitioning of this species to foraging on prey commonly present in such stands under lack of predation pressure and interspecies competition typical of more open areas (USDI 1992). Nevertheless, spotted owls have been known to forage short distances into harvested openings from a forested edge if a prey is available (Carey 2004).

Dispersal-only habitat for the northern spotted owl generally consists of mid seral stage stands between 40 and 80 years of age with canopy closures of 40 percent or greater and trees with a mean dbh of 11 inches or greater. Older stands lacking structural development that supports nesting may be considered dispersal habitat, however on some occassions may provide roosting or foraging opportunities for the species. Spotted owls generally use dispersal habitat to move between blocks of suitable habitat or, for juveniles, to disperse from natal territories (Forsman et al. 2002, USDI 2004a).

The reader is referred to the following documents for a more comprehensive and account of the biology, ecology, and status of the northern spotted owl: A Conservation Strategy for the Northern Spotted Owl (Thomas et al. 1990); Recovery Plan for the Northern Spotted Owl - (USDI 1992); Northern Spotted Owl Five-year Review Summary and Evaluation (USDI 2004a); Status and trends in demography of northern spotted owls, 1985 – 2003 (Anthony et al. 2004); Scientific evaluation of the status of the northern spotted owl - SEI Report (Courtney et al. 2004).

Pre-field Review: This project is consistent with current standards established for projects that could affect the northern spotted owl. These standards were established for the Willamette Province and are listed in both the Programmatic Biological Assessment (BA) (USDA et al. 2006) and the subsequent USFWS Letter of Concurrence (LOC) (USDI 2006) for projects which may disturb bald eagles and northern spotted owls during FY 2007 and 2008.

Effects not specifically discussed in this document pertaining to new threats to the spotted owl (USDI 2004a, Anthony et al. 2004, Courtney et al. 2004) such as wildfire, west Nile virus, and barred owls are of a cumulative nature considered beyond the scope of this individual project. Such threats are addressed in the FY 2007 – 2008 Disturbance BA and LOC, which provide a thorough analysis of new information pertaining to potential threats to this species.

Field Reconnaissance: Most of the project area is adjacent to or within 0.25 mile of suitable spotted owl habitat. No current surveys have been conducted for spotted owls associated with this habitat that may be used for roosting, foraging, or nesting activity. Based on recent U.S. Fish & Wildlife Biological Opinions pertaining to projects that may disturb spotted owls, unsurveyed suitable habitat must be assumed occupied. Project areas are not within a Late Successional Reserve or designated Critical Habitat Unit for spotted owls.

Only specific individual trees will be tipped over with this project. No suitable habitat acres will be modified by this project, and noise-generating activities associated with this project that may disturb spotted owls during the critical breeding season (March 1 – July 15) will be restricted from occurring.

Risk Assessment:
Project Effects: There are no recognized direct or indirect effects to spotted owl habitat from activities associated with this project as proposed. Effects to individual spotted owls that may be present in adjacent suitable habitat are limited to some potential for disturbance from noise-generating activities during the non-critical portion of the breeding season.

Cumulative Effects: The changing trend in timber management occurring within the past decade, and projected for the future, should positively influence occupancy of suitable habitat for northern spotted owls as previously harvested stands within these watersheds redevelop, and as more emphasis is placed on recruitment of key structural components missing from harvested stands as well as retention of key structural components present in unharvested stands and restoration/maintenance of special habitats as key components of biodiversity at a landscape level.

Current Standards and Guidelines governing management of the surrounding landscape provide direction that should provide for long-term maintenance of amount and distribution of suitable spotted owl habitat. Because of the location of harvest and non-harvest allocations, it is unlikely that cumulative effects would influence the ability of local populations to persist, or become established, by eliminating demographic linkages beyond the species dispersal capabilities.

Analysis of Significance: The Project does propose to tip over the identified 40 trees. These trees were surveyed on the ground to ensure they were not good candidates for suitable spotted owl habitat. However because this project does propose some activities that could result in disturbance to individual spotted owls during the non-critical portion of the breeding season, it is determined that implementing the Action Alternative **may affect, but is not likely to adversely affect northern spotted owls.** This project will have **no effect on designated critical habitat.**

Communication with U.S. Fish and Wildlife Service: Consultation for effects from proposed activities is incorporated in the Willamette Province FY 2007-2008 Disturbance BA dated 2006. The USFWS issued their LOC for effects to spotted owls from this type of project within the Willamette Province (FWS *reference*: 1-7-06-I-0192).

Recommendations: Impose seasonal restriction on activities associated with project that generate above-ambient noise levels during the spotted owl critical nesting period between March 1 and July 15.

2)Harlequin duck (*Histrionicus histrionicus*)

Habitat: Harlequin ducks use rivers, streams, and creeks as feeding habitat and commonly nest in bank cavities. Log jams and overhanging vegetation are most important along smaller streams whereas islands and mid-stream boulders are used for security cover on larger rivers (Wallen and Groves 1989). Harlequin ducks feed on aquatic insects, crustaceans, mollusks, tadpoles, and small fish. Macroinvertebrate levels may play a role in determining harlequin duck population densities.

Breeding ducks appear to require clean, fast-moving water, nearby loafing sites (consisting of exposed rocks, logs, or root wads), dense riparian shrubs and/or timber on the banks, and undisturbed drainages

(Cassirer and Groves, 1989). A number of authors have suggested that brood rearing areas do not correspond to nesting locations, and that broods move downstream from nesting areas (Wallen 1987; Cassirer and Groves 1989). Broods prefer lower gradient streams not less than 10 m in width, with overhanging vegetation, and plentiful woody material (Cassirer and Groves, 1989).

Several studies have pointed to the need for an absence of human disturbance in harlequin duck breeding habitat (Cassirer and Groves 1989), or observed an adverse impact of human activities on nesting ducks (Wallen 1987, Genter 1992). One study reported 90% of pairs observed within 300m of roads, residences, campgrounds, or trails (Schirato and Sharp 1992) but it is not yet clear whether this pattern only reflects the increased frequency of observers as opposed to an increased frequency of the duck in these areas.

Pre-field review/Field reconnaissance: Harlequin ducks have been seen with on the Southfork of the McKenzie River.

Analysis of effects: Harlequin ducks are vulnerable to increases in water temperature, fluctuations in water levels, and sedimentation. These physical characteristics determine the aquatic life situation that this duck feeds upon. Existing water quality is expected to be maintained.

Cumulative effects: None.

Conflict determination/risk assessment: No impact with seasonal restriction.

Recommendations: Apply a seasonal restriction between April 1-June 30.

Communications with U.S. Fish and Wildlife Service: Not required

3) American Peregrine Falcon (*Falco peregrinus anatum*)
Status Federal: None (Delisted 8/99)
State: Endangered
FS R-6: Sensitive, Identified as Management Indicator Species (MIS)

Determination: "no impact" to peregrine falcons or their habitat.

Status Background: Following a global population depression and the near total disappearance of the American peregrine falcon (*Falco peregrinus anatum*) from habitat throughout much of the United States, largely as a result of environmental contamination (Cade et al. 1988, USFWS 2003), the peregrine was listed as endangered in 1970 under the Endangered Species Conservation Act of 1969 (precursor to the ESA) and subsequently listed under the ESA in 1973. After meeting a variety of objectives listed in regional recovery plans, the peregrine was removed from the ESA list of endangered species on August 25, 1999. Since that time monitoring results suggest that population growth has continued throughout the lower 48 states (USFWS 2003).

Habitat: In the Pacific states, preferred peregrine falcon nesting sites are sheer cliffs 150 ft. or more in height with horizontal ledges (USFWS 1982). On the Willamette National Forest, cliffs with potential for nesting by peregrine falcons include those that are at least 75 feet high, have horizontal ledges, ledges with overhangs or cave-like openings, have sheer faces inaccessible to ground predators and within .5 miles of riparian habitat (USDA 2000). Peregrine falcons feed almost exclusively on birds,

many of which may be associated with riparian zones, large bodies of water or an abundance of snag habitat. Small birds on which peregrine falcons feed are present in drier open areas, particularly where hardwood shrubs and trees are abundant. Some avian prey species select for closed coniferous forest. Peregrine falcons can forage widely for prey and will hunt over closed coniferous forest canopies as well as in open areas and over hardwood patches - wherever prey is abundant (Cade et al. 1988).

Pre-field review: There is no suitable peregrine nesting habitat within or immediately adjacent to the project area. The project area is within the secondary and tertiary zones of two known peregrine nests (OE-59) and (OE-12).

As a result of annual site monitoring, adult and young peregrines from the nearby nest sites are known to forage for avian prey in and near the project area. Young peregrines may linger in this type of habitat while dispersing from a nest site. Proposed activities would not modify or disturb any suitable peregrine nesting habitat. All proposed activities would either occur outside the peregrine breeding season (January 1- July 31) entirely, or late in the breeding season and at a sufficient distance from nesting habitat such that any disturbance potential would be avoided (Pagel 1992, USDA 2002).

Field reconnaissance: The peregrine nest sites associated with the project area have been monitored annually throughout the breeding season since its discovery in 1997 and 1991 respectively. The sites has been occupied annually since that time, and have successfully fledged two young during the 2006 breeding season.

Formal breeding bird surveys have not been conducted within the planning area. The complete range of avian prey species that may currently occur in habitat throughout the project area is unknown, but expected to be typical for habitat associated with this area (O'Neil et al. 2001

Risk Assessment:
Project Effects: No suitable peregrine nesting habitat will be modified by this project. Due to the location and timing of proposed activities there should be no direct or indirect effects to peregrines from disturbance that would influence breeding, foraging, or dispersal behavior.

Tipping of individual trees may modify or disturb habitat suitable for use by some potential peregrine prey species. Because tree tipping would occur in late summer, habitat modification or disturbance would occur outside the breeding seasons for most prey species that could be utilizing affected habitat. Modification or disturbance activities are considered relatively insignificant considering the overall amount of foraging habitat within management zones established for the known peregrine nest sites (approximately 26,000 acres).

Cumulative Effects: Utilization of foraging habitat for peregrines as more emphasis is placed on recruitment of key structural components missing from harvested stands, retention of key structural components present in unharvested stands, and restoration and maintenance of special habitats as key components of biodiversity at a landscape level should positively influence occupancy of suitable nesting habitat by peregrines.

Analysis of Significance: This project does not propose any activity that would modify suitable peregrine falcon nesting habitat, and activities that could result in disturbance to peregrines by influencing either breeding or foraging behavior are not expected to occur due to spatial and temporal factors. A seasonal restriction will be in place from January 1 – July 15 to avoid disturbance to the birds.

In addition, annual monitoring of the nest sites will occur to document occupancy and breeding success. It is therefore determined this projct should have **no impact on peregrine falcons and their habitat.**

Communication with U.S. Fish and Wildlife Service: Not required.

Recommendations: None warranted.

4) Wolverine (*Gulo gulo*)
Status: Federal: None
State: Threatened
FS R-6: Sensitive

Determination: "no impact" to wolverine or its habitat.

Status Background: The South Fork McKenzie River watershed is within the recognized historic and current range for the wolverine (*Gulo gulo (luscus)*) which was petitioned for federal listing under the Endangered Species Act (ESA) in July 2000. On October 21, 2003 the U.S. Fish and Wildlife Service (FWS) issued a 90-day Finding for a Petition To List as Endangered or Threatened Wolverine in the Contiguous United States. In that finding it was determined that the petition did "not provide substantial information indicating that listing may be warranted". An earlier (1994) petition to list the wolverine was found to be "not warranted" by FWS.

Taxonomy can lead to confusion when assessing the status of this species and its historic or current potential occurrence in these watersheds. Sighting records frequently include the name "California Wolverine". However, the validity of such a nominal subspecies has been questioned or is not recognized throughout much of the published literature devoted to addressing this species (Banci 1994, Johnson and O'Neil 2001, NatureServe 2005, Verts and Carraway 1998). Therefore further references to wolverine in this document are intended to be interpreted as *Gulo gulo*.

Records show that the wolverine has been listed on the Regional Forester's Sensitive Animal List for at least the past fifteen years. The wolverine was one of the original species classified as threatened by the Oregon Fish and Wildlife Commission in 1975. The status of the species was reviewed in 1988 (Marshall 1988) and as a result of that review wolverine are currently listed as threatened under the Oregon Endangered Species Act.

Habitat and Ecology: A large block of literature has been published in the past decade pertaining to the biology, ecology, and management of wolverine (Banci 1994, Claar et al. 1999, Copeland 1996, Heinemeyer et al. 2001, O'Neil et al. 2001, Verts and Carraway 1998). This is not meant to suggest that all aspects of the ecological relationships between this species and its environment are well understood. On the contrary, some relationships such as responses to human disturbance are just beginning to be understood based on a scientific rather than anecdotal context (Joslin and Youmans 1999; Rowland et al. 2003). The following is a gross summary of wolverine ecology considered pertinent to the presence of this species in the vicinity of the project area. The reader is strongly encouraged to reference the literature for a more thorough understanding of this species.

The wolverine has been referenced as the largest-bodied terrestrial mustleid (Banci 1994) with a body weight three to four times greater than the fisher despite having a similar overall body length. Its robust appearance allows adults to be described as resembling a small bear.

O'Neil et al. (2001) list the wolverine in Oregon as associated with 26 forest structural conditions, 11 habitat types, 17 habitat elements, and as serving 5 key ecological functions within the identified associations. Overall data do not support any statistical association between the species and a particular vegetative community – a fact reflected by O'Neil in attaching a low confidence to all associations listed for structural conditions and habitat types. Forested habitats used by wolverines appear to vary geographically and seasonally in areas where they have been studied (Claar et al. 1999). Habitat preferences have been linked to areas based on the availability of food and low human occurrence. The most specific habitat need of wolverines may be for female denning habitat secure from human disturbance (Copeland 1996) throughout the breeding season, which can range from November through April (Banci 1994).

Current definition and subsequent identification of suitable wolverine habitat has evolved largely from Copeland's (1996) study of a wolverine population in central Idaho. Because of a widely published concern regarding the sensitivity of wolverines to human disturbance at natal den sites (Banci 1994, Claar et al. 1999, Copeland 1996, Krebs and Lewis 1999, Lyon et al. 1994, Youmans 1999a), there seems to be scientific consensus that identification of female denning habitat is key to managing for this species where it is likely (or known) to occur. Following that logic the Willamette National Forest created a GIS layer in 1998 based on criteria provided by the Regional Office in an effort to identify potential denning habitat. Habitat generally described as areas having a northerly aspect for higher elevation cirque landscape features with a large boulder/talus component and a relatively open canopy was mapped across the Forest.

Wolverine are generally described as opportunistic omnivores in summer and primarily scavengers in winter while they utilize extremely large home ranges in proportion to their body size. Adult wolverine home range sizes average 148mi^2 for females and 610mi^2 for males (Copeland 1996). They are capable of foraging widely (30-40 km) on a daily basis, and do not significantly use young, dense stands of timber or clearcuts (Banci 1994). Virtually all studies that have investigated food habitats for the species have shown wolverine to be closely associated with a dependency upon the availability of large mammal carrion to balance its energy budget during critical periods of its lifecycle.

Pre-field Review: Habitat conditions during the reference era in watersheds surrounding the project area favored the likelihood of occupancy by wolverine as it is located well within the historic range for this species, and would have been relatively free from human disturbance – especially during the breeding season. Then, as now, population densities would be expected to have been low given our current understanding of wolverine ecology.

An issue regarding the reliability of current and historical presence of species such as the wolverine based on anecdotal records considered to be unverifiable has been raised (Aubry and Lewis 2003; McKelvey et al. 2002; McKelvey et al. 2000). The issue is associated with using such observational data combined with verifiable records to arrive at conservation actions and management recommendations. While some investigators believe combining such occurrence records results in scientific and legal vulnerability, others apparently do not (Rowland et al. 2003). Based on historic and current information, this analysis assumes the potential for wolverine to utilize habitat associated with this project for one or more of its biological requirements.

Field Reconnaissance: This project is located on a prominent landscape feature providing a westerly extension to upper elevation habitat connected to a vast remote area of the Western Oregon Cascades.

The 1998 habitat mapping revealed numerous small patches of potential denning habitat located to the east of the project area. Rocky outcrops associated with some potential habitat are visible from various locations within the project area. Most potential denning habitat is considered to be relatively free of human disturbance from winter recreation activities throughout much of the breeding season. However, winter activities such as cross country skiing and snowmobiling can be expected to occur periodically in surrounding areas. Although currently small in scale, these types of winter recreation do have potential to disturb wolverine – particularly a female that may be utilizing nearby denning habitat. This project or surrounding areas are open to a variety of human recreation activities throughout the remainder of the year. Activities such as hiking, horse back riding, and pleasure driving are considered to have less potential to disturb any wolverine that may be simply foraging or dispersing through nearby habitat.

Risk Assessment:
Project Effects: This project proposes no activities that would result in modification or disturbance of potential natal denning habitat. Project activities should not compromise foraging or dispersal opportunities for any individual to any estimable extent. For these reasons there are no recognized direct or indirect effects to this species associated with the project.

Cumulative Effects: If security of natal denning habitat from human disturbance is critical for the persistence of wolverine in an area, the ability of this species to occupy otherwise suitable habitat in this area has likely been compromised by activities not associated with this project. Road building has allowed a variety of motorized and non-motorized winter recreation to extend into many areas surrounding the project area that were not historically readily accessible. Cumulative effects associated with human disturbance in the form of winter recreation have negatively influenced suitability of many areas to support denning activity. .

If access to areas where wolverine may depend on larger mammals as a food source during critical times of the year is another factor influencing the persistence of this species in an area, wolverine have likely benefited from past harvest activity that has resulted in a wider distribution of forage habitat for big game. During the past decade however, harvest practices have changed and this positive contribution is waning rapidly as forage units regenerate into hiding cover.

The cumulative effect of this project as it pertains directly to big game and indirectly to wolverine will be positive, but immeasurable on a landscape scale.

Analysis of Significance: This project does not propose any activity that would modify or otherwise disturb potential wolverine denning habitat. Considering the wide-ranging nature of daily movements associated with wolverine foraging and/or dispersal behavior along with the low likelihood of occurrence and timing of project activities, this project should not result in disturbance to the species. It is therefore determined this project should have **no impact to wolverines or their habitat.**

Communication with U.S. Fish and Wildlife Service: Not required.

Recommendations: None warranted.

5) Pacific Fringe-tailed Bat (*Myotis thysanodes vespertinu*)
Status: Federal: None
State: None

FS R-6: Sensitive

Determination: "no impact" to individuals or habitat for Pacific Fringe-tailed bats

Habitat: The Pacific fringe-tailed bat was added to the Regional Forester's sensitive animal list in November 2000 based on the Natural Heritage Ranking for the species. This species is one of the three named sub-species of fringed myotis (*Myotis thysanodes*), which is among the bat species whose specific habitat needs are addressed under a Northwest Forest Plan standard and Guideline (2001 ROD pp 37-38).

This bat is considered a riparian associate species that has been associated with mixed-conifer forests having relatively dry moisture regimes in the Coast Range and southern Cascade Range of Oregon (NatureServe 2005, O'Neil et al. 2001). Other scattered locations occur in the Washington Cascades and into California and the desert Southwest. They may occur from near sea level to above 4000' in Oregon and utilize a wide range of habitats – from forested to non-forested (Hayes 2003, Verts and Carraway 1998). Foraging behavior specific to this species is poorly documented, however they have been described as aerial foragers and hovering gleaners (O'Neil et al. 2001). Maternity sites, hibernacula, and most documented individual roost sites for fringed myotis occur in rock crevices, caves, or anthropogenic structures. However Weller and Zabel (2001) recently published data that show a significant amount of individual roosting occurring in trees/snags when this species occurs in or near forested habitat. Structures associated with live trees or snags have since been recognized as the primary roost structures for this species when it occurs in/near forested habitat and features associated with caves, mines, bridges or buildings may serve as primary roost structures in non-forested habitat (Hayes 2003). Knowledge of roosting behavior is almost exclusively based on data obtained during the breeding season for this species which likely extends from May through August (O'Neil et al. 2001).

Pre-field Review: The potential exists that at least single individuals may utilize available forage and roost habitat throughout the summer and early fall in or adjacent to areas where proposed habitat restoration activities would occur.

Field Reconnaissance: Formal bat surveys within the project area have not been conducted. There are no caves, mines, or abandoned wooden bridges and buildings that would serve as suitable hibernacula nor are there known roost sites associated with other structures within 250 feet that would be affected by proposed activities. Some snags and decadent trees occurring adjacent to proposed treatment areas contain features suitable for roost use by bats – including *Myotis thysanodes*.

Risk Assessment:
Project Effects: This project proposes to tip trees within a size class considered to provide potential as roosting habitat for *Myotis thysanodes* (Weller and Zabel 2001). Measures will be taken to protect snags or decadent trees adjacent to the project trees that may provide roosting habitat. Enhancement activities proposed by this project should not compromise roosting or foraging opportunities for any individual to any estimable extent, and therefore should not result in any direct effect to Pacific fringe-tailed bats.

Cumulative Effects: Current Standards and Guidelines governing management of the landscape in watersheds surrounding the project area provide direction that should provide for long-term maintenance of amount and distribution of suitable habitat for *Myotis thysanodes*. Because of the range and location of land allocations in this area, it is unlikely that cumulative effects would influence the ability of local populations to persist, or become established, by eliminating demographic linkages beyond the species

dispersal capabilities. The cumulative effect of this project on roosting or forage habitat as it pertains directly to this species would be immeasurable on a landscape scale.

Analysis of Significance: There is no known threat to hibernacula or maternity roosts from activities proposed under this Project. Suitable roosting habitat adjacent to the project areas should not be affected by this proposal, and activities that could result in disturbance to this species by influencing either roosting or foraging behavior are not expected to occur. It is therefore determined this projct should have **no impact on Pacific fringe-tailed bats and their habitat.**

Communication with U.S. Fish and Wildlife Service: Not required.

Recommendations: Protect decadent trees and snags >12"dbh (roosting habitat) adjacent to the project area to the greatest extent feasible while conducting restoration activities.

6) Crater Lake Tightcoil (*Pristiloma arcticum crateris*)
Status: Federal: None
State: ODFW none / Natural Heritage S1
FS R-6: Sensitive / Survey and Manage Species

Determination: "no impact" to individuals or habitat for Crater Lake Tightcoil.

Status Background: The Crater Lake tightcoil has been listed as a Survey and Manage species since the 1994 Northwest Forest Plan ROD (USDA, USDI 1994). Under the 2001 ROD (USDA, USDI 2001) it was classified as a Category B species. The species was changed to a Category A species following the 2002 Annual Species Review where it remains considered rare, and for which pre-disturbance surveys are practical if habitat is present. It was added to the Regional Forester's sensitive animal list in July 2004.

The species is endemic to Oregon, and known to occur above 2000 feet elevation throughout the Oregon Cascades from the Mt Hood National Forest south to the Winema National Forest. As of August 2005 specimens had been confirmed at approximately 160 sites from very limited locations across this range (Duncan 2004, NatureServe 2005).

Habitat and Ecology: *Pristiloma arcticum crateris* "may be found in perennially moist situations in mature conifer forests and meadows among rushes, mosses and other surface vegetation or under rocks and woody debris within 10 m. of open water in wetlands, springs, seeps and streams, generally in areas which remain under snow for long periods in the winter. Essential habitat componenst include uncompacted soil, litter, logs, and other woody debris in a perennially wet environment."(Duncan 2004).

This species is among many organisms functioning as primary and secondary consumers that contribute to soil building and dissemination of spores and microbes. Having very limited dispersal capabilities on their own, they may be assisted in dispersal by other vectors capable of transporting mud that may contain eggs or adults across distances into suitable habitat (Duncan et al. 2004). An example of such dispersal could be individuals in mud transported on the hoof of a deer or elk.

Loss or degradation of suitable wetland habitat has been identified as the major threat to this species.

Pre-field Review: Prior to 2005 the presence of the Crater Lake Tightcoil had not been documented on the Willamette National Forest. However in May 2005 a specimen that has since been confirmed to be *Pristiloma arcticum crateris* was collected on the Middle Fork Range District south of this project area.

Nevertheless, based on habitat described in an established survey protocol for this species (Duncan et al. 2003) it is considered that suitable habitat for Crater Lake Tightcoil exists within the project area.

Field Reconnaissance: Based evaluation criteria to determine the need to conduct a survey, surveys for Crater Lake Tightcoil are not considered to be required for this project. This consideration is made because perennially wet habitat will not be degraded or removed with this project. In addition, existing roads will be used for access. For this reason the persistence of the species if present in the project area should not be compromised.

Risk Assessment:
Project Effects: Because measures will be taken to protect suitable habitat for this species against disturbance or modification from effects associated with proposed activities, there are no recognized direct or indirect effects to this species or its habitat from the project.

Cumulative Effects: Because measures will be taken to protect suitable habitat for this species against disturbance or modification from effects associated with proposed activities, there are no recognized cumulative effects to this species or its habitat from the project.

Analysis of Significance: Suitable habitat for the Crater Lake Tightcoil exists in portions of the project area, however measures will be taken to protect this habitat where it occurs against disturbance or modification from effects associated with proposed activities, therefore there should be **no impact to Crater Lake Tightcoil or its habitat** from this proposal.

Communication with U.S. Fish and Wildlife Service: Not required.

Recommendations: Ensure that measures identified to prevent habitat disturbance within 10 meters of perennially wet areas.

This document was prepared by: /s/ Shane D Kamrath Date: October 27, 2006

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Appendix 1: Literature referenced during this biological evaluation to arrive at determinations regarding potential effects/impacts from proposed projects and activities.

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Appendix C

File Code:	2600 Wildlife	**Date:**	26 October 2006
Route To:	Files		
Subject:	Terrestrial Wildlife Report for: South Fork Mckenzie Enhancement and Protection Project -		
To:	Files		

INTRODUCTION

This report serves to document potential impacts to terrestrial wildlife designated as Survey and Manage (USDA 1994, 2001) and Management Indicator Species (USDA 1990) plus other wildlife and associated habitat that may occur in or near the project. A separate Biological Evaluation (BE) addresses effects to Threatened, Endangered and Sensitive (TES) fauna species.

PROJECT LOCATION AND DESCRIPTION

The project is located along the upper South fork Mckenzie River between Homestead campground and Elk creek confluence, a distance of 7.5 miles, and along Roaring River from its confluence with the South Fork Mckenzie River, to near Roaring River Campground, a distance of 0.5 miles. This project is located in Lane County, Oregon on the Willamette National Forest.

Purpose and Need for Action

The purpose for action is to enhance habitat and water quality conditions for spring Chinook salmon and bull trout to meet direction in the Willamette National Forest Plan as amended, and move toward recovery of both Threatened species as directed by the Endangered Species Act.

The need for action was documented in findings of the South Fork McKenzie Watershed Analysis (USFS 1994) where loss of early life habitat for bull trout and spring Chinook salmon in the upper South Fork McKenzie River and lower Roaring River was found. Recommendations from the South Fork McKenzie Watershed Analysis place highest priority on recovery of aquatic habitat in the South Fork McKenzie River. As a Tier 1 Key Watershed, the South Fork McKenzie River is highest priority under the Northwest Forest Plan for protecting and restoring aquatic habitat.

This project is needed to restore habitat prioritized by McKenzie sub-basin partners in the McKenzie Watershed Council (MWC). Sub-basin assessments conducted by the MWC found the lower McKenzie River and South Fork McKenzie River as highest priority for restoration though Ecosystem Diagnosis and Treatment (EDT) evaluation.

Currently, a permanent trap-and-haul facility is planned by Army Corps of Engineers to collect adult spring Chinook salmon and bull trout below Cougar Dam. The facility will reconnect, through physical transport, migrating spring Chinook and bull trout to the river above the dam. Utilization of naturally produced and migrating spring Chinook and bull trout is expected to benefit South Fork McKenzie specific fish populations and assist in perpetuating local adaptation. The Cougar Dam trap-and-haul facility is expected to be complete in 2008.

Proposed Action

The District Ranger on the McKenzie River District proposes to supplement in-stream large woody material in the South Fork McKenzie River and lower Roaring River. Repositioning previously placed restoration wood with implementation of the project would occur. The proposed action includes closure of 12 non-system roads to protect water quality in the project area. Implementation of this proposal, listed within this document as Alternative A, would occur beginning summer 2007.

Alternative A – Proposed Action

The South Fork McKenzie River Enhancement Project proposes supplementation of existing woody material to act as flow deflection and develop off-channel habitat. The large woody material (LWM) would be placed in the South Fork McKenzie and Roaring River channel upstream of Homestead Campground. Existing large woody material would be supplemented with trees selected from the adjacent Riparian Reserve, and with imported woody material from nearby upland sources. The collection and staging of LWM from an upland source will be evaluated as part of this project. The purpose of importing woody material is to supplement an existing low density of large woody material in the South Fork McKenzie and Roaring River. Currently, the density is 29 pieces of large wood per mile (>24 inch diameter by 50 foot length) in the enhancement reach. The reach between Homestead Campground and Elk Creek confluence is approximately 8 miles long, and is known rearing habitat for spring Chinook salmon (offspring of adult salmon transported above Cougar Dam by Oregon Department of Fish and Wildlife [ODFW]) and bull trout. The low volume of sources of flow deflection is known to limit the opportunity for the South Fork channel to migrate laterally and develop off-channel habitats important to bull trout and spring Chinook salmon.

Techniques to place the woody material would be used to minimize impacts to other resources. Cables would be used to pull over live trees from the Riparian Reserve. Pulled over trees would function as "key features" by providing stability for wood accumulations. Equipment used to tip live trees would work from Rd 431, Rd 1964 and non-system roads. Following placement of key features, material would be imported using helicopter, or by hand-crews, to form an accumulation. Helicopter or hand-crew placement provides full suspension to place imported material and presents minimal disturbance of the river bottom and adjacent riparian area. By importing approximately 280 pieces of LWM, the proposed final density of large woody material would be about 80 pieces in the 8.5 mile enhancement reach.

Forty trees would be utilized from the adjacent Riparian Reserve to serve as "key" features behind which imported material would stabilize. Key features are large diameter trees, with root mass attached, selected for their ability to remain stable during most high flow events. The live trees selected to serve as key features are located at distances from the channel from stream bank to 50 feet from the active channel. The size of tree selected for key features ranges from 22 to 52 inches in diameter at breast height, averaging 32 inches in diameter. The trees selected for restoration of in-stream wood are dispersed through the 8.5 mile enhancement reach on each bank. Twenty-six trees are located along the left bank, looking downstream (Rd 431 and Rd 1964 side), and fourteen along the right bank (Rd 19 side). Once key features are in place in the channel, helicopter and/or hand-crew placement of imported material would occur. Project implementation is planned to occur beginning in summer season 2007 and is dependent upon equipment and crew availability. Tree tipping would occur during early summer and helicopter and/or hand-crew placement would occur following key wood placement, during late summer 2007. Material would be added upstream of each key piece of woody material, to mimic natural accumulations or jams. Woody material jams would consist of 2-8 piece accumulations. Numerous opportunities exist for channel spanning accumulations. All placement activity would occur during the ODFW in-stream work period for the South Fork McKenzie River, July 15 through August 15, to minimize impacts to wildlife and fisheries.

A helicopter landing for refueling and service would be located on Road 985 landing. Road 985 is ¼ mile long, located adjacent to Roaring River. A spill containment structure would be required of potential helicopter use of Rd 985 landing. Restoration material would be staged in landings on Rd 425, Rd 429, Rd 431, Rd 1964 and Rd 414. Restoration material destined for helicopter transport to the enhancement reach would be collected from road-side salvage and existing stockpiles and would consist of whole trees with root-mass intact and root-less tree boles. Enhancement material would be flown directly from the staging site to the river reach. A Flight Safety Plan and Spill Plan will be required

prior to flight operations. Timing requirements for implementation are estimated at 3-4 days for placement of stream adjacent trees and 1-2 days for aerial placement of staged material. Equipment cleaning precautions will be utilized to avoid potential introduction or spread of noxious plants from ground based equipment. Seasonal operation restrictions will be used to avoid disturbance of wildlife and fisheries resources. Maintenance of previous in-stream enhancement project work would be accomplished with this proposal. Project work completed during 1996 and 1998 would be repositioned by helicopter or hand crews. Approximately 400 pieces of large woody material would be repositioned in the 8 mile South Fork McKenzie. Smaller sized material may be placed by hand to minimize disturbance to riparian and aquatic habitat. Previously placed small material that can be handled by a crew of 6-8 would be lifted from nearby river banks and transported to a channel destination. The option of using hand crews or helicopter in placing small material (500-800 pounds in weight) is dependent upon crew and equipment availability.

Large woody material placed in the restoration reach will not be attached by artificial means such as cable. The placement of whole trees, with a portion on the bank, particularly trees with root-mass intact, is expected to contribute to in-stream structure stability. A pre-project examination of the restoration reach was made through low elevation photography in anticipation of the project. Currently existing large wood was tagged during field surveys conducted by Oregon State University (September 2001). All material of natural and human-placed origin and side channel development would be monitored through periodic low elevation aerial photography.

Treatment of 12 non-system roads through road closure or campsite containment would result in alteration of access to 12 dispersed campsites. Road accesses that travel through the South Fork McKenzie and Roaring River floodplains would be modified to exclude vehicle entry into stream channels and wet areas. Treatment would involve containment of vehicle access using boulders or berm. A seedbed on road surfaces would be prepared through scarification or ripping. Approximately 3,000 feet of road surfaces would be seeded and planted using native plants following soil preparation. Several campsites require rehabilitation to address degraded site conditions, such as denuded stream banks, eroding soils and drainage problems. Proposed treatments include planting campsite perimeters, drainage improvement and water-barring, and importation of organic material to stabilize soils. There would be no change in access to 14 dispersed campsites, with modification of access to 12 dispersed campsites. The 12 dispersed campsites would continue to exist and be accessible to foot traffic.

Alternative B – No Action

The No Action alternative would not implement actions to restore in-stream large woody material in the South Fork McKenzie project area. Aquatic habitat degradation and water quality impacts presented by continuing use of non-system roads in wet areas would continue. This alternative allows existing problems such as low in-stream wood density and simplified habitat for at-risk species to continue untreated and dependant upon natural rates of input to replenish existing condition. Under the No Action alternative, current management plans would continue to guide management of the project area. The No Action alternative provides a basis for describing the environmental effects of the proposed action.

MANAGEMENT DIRECTION COMPLIANCE

Proposed action associated with this project complies with current forest Standards and Guidelines (S&Gs) pertaining to MIS and Survey and Manage Species management. This proposal also complies with other S&Gs established in the Willamette National Forest Land and Resource Management Plan (1990) as amended by the Northwest Forest Plan Records of Decision (ROD) (1994, 2001, and 2004).

SNAGS AND DOWN WOOD

The significance of the ecological role of snags and down wood in influencing ecosystem diversity and productivity is addressed in the Willamette National Forest Land and Resource Management Plan (1990). The significance of this relationship in coniferous forests of the Pacific Northwest is further emphasized by management Standards and Guidelines under the Northwest Forest Plan ROD (1994, 2001, 2004) and elsewhere throughout published literature (Hallett et al. 2001, Laudenslayer et al. 2002, Lewis 1998, Rose et al. 2001).

DecAID is a web-based advisory tool to help land managers assess impacts of forest conditions and existing or proposed management activities on organisms that use snags and down wood (Mellen et al. 2006). It is a summary, synthesis, and integration of published scientific literature, research data, wildlife databases, forest inventory databases, and expert judgment and experience. DecAID was used to query literature of down wood use in riparian areas by terrestrial wildlife.

This project would comply with Forest Plan Standards and Guidelines pertaining to snag and down wood management. Project effects would result in a negligible contribution to effects that have already occurred from past management actions on the landscape throughout the project area. There are no reasonably foreseeable future actions that would affect dead wood habitat in the project area.

The no action alternative would not involve pulling over of trees or importing wood to either create or remove standing trees or down wood. Natural processes that affect the creation and removal of snags and down wood will include insects and pathogens, wildfire, and wind events.

SURVEY AND MANAGE, AND OTHER 2001 ROD SPECIES/HABITAT (USDA, USDI 2001).

Species listed below in Table 1 were compiled from the 2003 Annual Species Review (IM-OR-2004-034) and incorporates those vertebrate and invertebrate species whose known or suspected range includes the Willamette National Forest according to the following documents: Survey Protocol for the Great Gray Owl within the range of the Northwest Forest Plan v3.0, January 12, 2004; Survey Protocol for the Red Tree Vole v2.1, October 2002; Survey Protocol for S&M Terrestrial Mollusk Species From the Northwest Forest Plan v3.0, 2003. The following list includes category A and C species; there are no known category B, D, E, or F species to consider in this area.

Table 1: Survey & Manage Wildlife Species Known or Suspected on the Willamette National Forest.

Species	S&M Category	Survey Triggers			Survey Results			Site Management
		Within Range of the Species?	Project Contains Suitable habitat?	Project may negatively affect species/habitat?	Surveys Required?	Survey Date (month/year)	Sites Known or Found?	
Vertebrates								
Great Gray Owl (*Strix nebulosa*)	A	Yes	Yes	No	No	N/A	--	No
Red Tree Vole (*Arborimus longicaudus*)	C	Yes	Yes	No	No	N/A	--	No
Mollusks								
Crater Lake Tightcoil (*Pristiloma arcticum crateris*)	A	Yes	Yes	No	No	N/A	--	No

Statement of Compliance. Pre-disturbance surveys and management of known sites required by protocol standards to comply with the *2001 Record of Decision and Standard and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measure Standards and Guidelines* (as the 2001 ROD was amended or modified as of March 21, 2004) were completed for the Two Bee Project. There are no known Category B, D, E, and F species within the Project area.

Survey and Manage Species - Discussion:

Great gray owl (*Strix nebulosa*):

Under the 2001 amendment to the Northwest Forest Plan (USDA, USDI 1994) the status of the Great Gray Owl changed from a protection buffer species to a Category C Survey and Manage species (USDA, USDI 2001). The species was changed to a Category A species following the 2002 Annual Species Review where it remains considered rare, and for which pre-disturbance surveys are practical if habitat is present.

Suitable Great Gray Owl Nesting, roosting and foraging habitat does not exists within the project area. Protocol surveys were not conducted for Great Gray Owls. There is an abundance of suitable nesting structures for Great Gray Owls throughout the project area. However, foraging areas are a limiting factor as large natural meadows with gopher activity are not present in the area. The Project will not significantly impact foraging areas and therefore, impacts to Great Gray Owls are expected to be negligible compared with cumulative impacts that have occurred from past actions such as fire suppression.

Crater Lake tightcoil (*Pristiloma arcticum crateris*):

The Crater Lake Tightcoil has been listed as a Survey and Manage species since the 1994 Northwest Forest Plan ROD (USDA, USDI 1994). Under the 2001 ROD (USDA, USDI 2001) it was classified as a Category B species. The species was changed to a Category A species following the 2002 Annual Species Review where it remains considered rare, and for which pre-disturbance surveys are practical if habitat is present. This species is also included on the Regional Forester's Sensitive Species List, and a more thorough discussion of how proposed activities may impact this species is conducted in the biological evaluation for this project.

Suitable habitat for Crater Lake Tightcoil exists within the project area. Surveys are not required for this type of project because existing roads are being used for equipment access. Protocol surveys were not conducted. Because measures will be taken to protect suitable habitat for this species against disturbance

or modification from effects associated with proposed activities, there are no recognized direct, indirect, or cumulative effects to this species or its habitat from the project.

Red tree vole (*Arborimus longicaudus*):
The red tree vole was initially listed as a Survey and Manage species in the 1994 Northwest Forest Plan ROD (USDA, USDI 1994). In the 2001 ROD the red tree vole was classified as a Category C species. Under that classification it was considered uncommon, where pre-disturbance surveys were considered practical, and where survey requirements applied across the known or suspected range of the species. Based on survey results that revised the understanding of occurrence, distribution, and habitat use, the 2003 Survey and Manage Annual Species Review removed the red tree vole from the Survey and Manage list within the Mesic Zone portion of its range. This project is within the Mesic Zone therefore Survey and Manage requirements for this species do apply to this project. Protocol surveys were not completed for this project.

Other ROD Species/Habitat:

Cavity-nesting birds - White-headed woodpecker, black-backed woodpecker, pygmy nuthatch, and flammulated owl: The white-headed woodpecker, black-backed woodpecker, pygmy nuthatch, and flammulated owl will not be sufficiently aided by applying mitigation measures for riparian habitat protection or other elements of the Northwest Forest Plan (USDA, USDI 2001 and 2004). These four species occur primarily on the periphery of the range of the northern spotted owl on the east slope of the Cascade Range in Washington and Oregon. However they are known to occur in Westside Oregon Cascades habitat.

Surveys are not required for these species, and there is no confirmation of their occurrence from recent or historic sighting reports within the project area.

The proposed Project involves activities that could directly affect current habitat associated with dead wood or defective trees. A discussion of how proposed activities may impact this habitat component is conducted in the Snags and Down Wood section of this document.

Bat roosts – caves, mines, and abandoned wooden bridges and buildings: There are no caves, mines, abandoned wooden bridges or buildings within the project area that would need to be protected from activities associated with this project.

Project Effects and Cumulative Effects to Survey and Manage, and Other ROD Species: Activities proposed by this project include measures that maintain and protect habitat components important to support potential use by Survey and Manage, and other ROD Species. Implementing project activities as proposed should have no direct or indirect effect on these species such that their ability to persist within the project area or throughout their ranges would be compromised.

Current S&Gs governing management of this area provide direction that should ensure the long-term maintenance of amount and distribution of suitable habitat for this group of species. Project effects are likely to result in a minimal overall contribution to cumulative effects that have occurred from past actions the project area.

MANAGEMENT INDICATOR SPECIES (USDA 1990)

Background and Effects Summary: The Willamette Forest Plan has identified a number of terrestrial wildlife species with habitat needs that are representative of other wildlife species with similar habitat requirements for survival and reproduction. These management indicator species (MIS) include spotted owl, bald eagle, peregrine falcon, cavity excavators, pileated woodpecker, deer, elk, and marten. Spotted owls, bald eagles, and peregrine falcons are addressed in a separate Biological Evaluation. The other MIS have potential to occur in or near the project area and are addressed below. Activity associated with the proposed action is consistent with, or exceeds Willamette Forest Plan Standards and Guidelines as they pertain to MIS management.

Project activities could result in disturbance to MIS that may be present in or adjacent to the immediate area. However, any modification or disturbance that may occur associated with this project is not of a scale that would threaten the viability of any MIS to persist within the project area or throughout the range of these species**.**

Pileated Woodpecker:

Current, as well as historic, composition and structure associated with habitat type and plant associations surrounding the project area favor nesting and foraging use by pileated woodpeckers (Marshall et al. 2003, NatureServe 2005, O'Neil et al. 2001).

Effects from proposed activities previously addressed in this report pertaining to snags and down wood as habitat important to cavity nesting birds, are also relevant to how this project may affect this MIS.

Currently the Oregon Natural Heritage Program (ONHP), The Nature Conservancy (TNC), and the Oregon Department of Fish and Wildlife (ODFW) show the status of the pileated woodpecker to be secure, which may suggest the changing trend in timber management that has occurred within the past decade, and projected for the future, may positively influence occupancy of suitable habitat by this species as previously harvested stands redevelop, and more emphasis is placed on retention of key structural components in unharvested stands (USDA 1985, USDA 1994).

Elk/Deer (Big Game):

The Willamette NF Land and Resource Management Plan recognizes elk emphasis areas as either low, moderate or high. The project contains 2 high emphasis areas and one moderate emphasis area. The South Fork Mckenzie Watershed Analysis contains habitat effectiveness analysis (Wisdom et al 1986) for these three emphasis areas. Table 1 displays habitat values for habitat patch size and spacing (HEs), open road density (HEr), cover quality (HEc), forage quality (HEf), and overall habitat quality (HEI) that existed for big game habitat when watershed analyses were conducted for this area.

The analysis for these emphasis areas showed Standards for all habitat variables were being met except for forage quality in the Elk high emphasis area and forage quality and open road density in the Roaring moderate emphasis area.

Table 2. Elk Emphasis areas for the South Fork Mckenzie Enhancement and Protection Project

Name	Level	HEs	HEr	HEc	HEf	HEI
Cascade	High	.57	.51	.62	.54	.56
Elk	High	.54	.81	.65	.36	.49
Roaring	Moderate	.65	.36	.73	.32	.49

note: Willamette NF Land management Plan S&G Target Levels
High emphasis level individual Index >0.5 Overall Index >0.6
Moderate emphasis level individual Index >0.5 Overall Index >0.6

Current ODFW biological data are not sufficient to provide an accurate estimate of the black-tailed deer population in western Oregon (ODFW 2002). Recent ODFW elk population estimates show that state management units in the vicinity of the project area (McKenzie, Upper Deschutes) have elk herds with population numbers near their current management objectives (Bill Castillo pers com; ODFW 2003; ODFW 2005).

Project effects to big game are unquantifiable on an individual basis relative to the amount of habitat modified or disturbed against the amount available to these species on a daily basis in the affected emphasis areas. Direct and indirect effects are largely limited to potential temporary displacement of individuals occurring in habitat during implementation of proposed activities. Short and long-term effects to forage habitat will be beneficially evident within the project area. In the context of the emphasis areas, and adjacent 5th field watersheds, project effects would result in an immeasurable contribution to cumulative effects that have already occurred from past management actions surrounding the project area.

Given what is currently known about local deer and elk populations, the future viability of these species should be assured as long as habitat restoration opportunities continue to be implemented especially when conducted at an appropriate scale.

Marten:
Marten occupy a narrow range of habitat types found in or near coniferous forests. More specifically, they associate closely with late-successional stands of mesic conifers – especially those with complex physical structures near the ground such as large low snags and down wood (Chapin et al. 1997, NatureServe 2005, Ruggiero et al. 1994, Verts and Carraway 1998, Zielinski et al. 2001). Marten are known to occur within the project watersheds, and despite lack of documented presence in the immediate vicinity it should be assumed the species is likely a member of the local faunal community.

Currently the ONHP, TNC, and the ODFW show the status of this species to be secure or not immediately imperiled, which suggests species viability may be assured as long as adequate protection measures such as Standards and Guidelines governing activities proposed by this type of project continue to be implemented.

Cavity Excavators:
The significance of snags as one component characterizing both old-growth and younger timber stands, and the dependence of primary cavity excavators on this component as MIS that provide nesting and denning habitat for numerous additional species of birds and mammals (secondary cavity nesters) is addressed in the Willamette National Forest Land and Resource Management Plan (1990). The

significance of this relationship is further emphasized by management S&Gs under the Northwest Forest Plan ROD (1994, 2001, 2004) and elsewhere throughout published literature (Hallett et al. 2001, Lewis 1998, Olson et al. 2001, Rose et al. 2001).

Except for the downy woodpecker, all species of primary cavity excavators used as ecological indicators in the Willamette Forest Plan (USDA 1990) have current and/or future potential to occupy habitat surrounding the project area based on recognized associations with the Westside Lowland Conifer-Hardwood Forest (O'Neil et al. 2001).

Effects from proposed activities previously addressed in this report pertaining to snags as habitat important to cavity nesting birds, are also relevant to how this project may affect this group of MIS cavity excavators.

Activities proposed by this project include measures that maintain and protect habitat components important to support use by the group of cavity excavators listed as MIS. Implementing project activities as proposed should have no direct or indirect effect on these species such that their ability to persist within the project area or throughout their ranges would be compromised. Current Standards and Guidelines governing management of this area provide direction that promotes long-term maintenance of amount and distribution of suitable habitat for this group of species.

MIS summary:
Although proposed activities would modify some suitable habitat, and likely disturb some individual terrestrial MIS that may be present, they should not threaten the capability of any local population of these species to persist or become established in the project area. Any project effect considered negative in this regard would be short-term and minimal compared to the amount of habitat available in the surrounding landscape. Cumulative effects to MIS from proposed activities would be small in scale.

Recommendations Pertaining To MIS: For cavity excavators (including pileated woodpecker and secondary cavity nesters) and marten - recognize previous recommendations made in this report pertaining to snags and other dead wood habitat.

LAND BIRDS / NEOTROPICAL MIGRANTS

Land bird species exhibit a dramatic response to the height, seral stage, canopy structure, and spatial distribution associated with forest habitat where greater numbers of birds are associated with more complex heterogeneous forested landscapes (Altman 1999). The current amount of forested and open ecotonal habitat characteristic throughout the project area should be attractive for use by a variety of avian species (Gilbert and Allwine 1991). However effects from past management practices – specifically fire suppression – have resulted in simplification of habitat throughout this area.

Effects to Land Birds/Neotropical Migrants: Proposed activities would generally occur outside the breeding season for these species and/or at a time when many may have migrated from the area (Marshall et al. 2003, O'Neil et al. 2001, NatureServe 2005). The timing of activities would mitigate potential short-term (< 5 years) negative effects from habitat modification such as temporary loss of some potential nesting habitat, or disturbance such as temporary displacement of individuals or their prey from prescribed burning activities. The number of individuals and/or species potentially affected by proposed activities is unknown and considered unquantifiable without reliable survey data. Activities proposed by this project should not affect this group of species such that their ability to persist in the vicinity of the project area or throughout their ranges would be compromised.

Project effects to Land Birds/Neotropical Migrants are of no measurable consequence on an individual basis relative to the amount of habitat modified or disturbed against the amount available throughout the surrounding Forest. Project effects would result in negligible overall contribution, with respect to historic habitat and biodiversity, to cumulative effects that have occurred from past actions affecting the project area.

Prepared by: _/s/ Shane D. Kamrath_____ Date_____10-27-2006_____

Shane D. Kamrath
Wildlife Biologist
McKenzie River Ranger District
Willamette National Forest

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Date: October 31, 2006
File Code: 2670 Botany
Subject: Biological Evaluation for South Fork McKenzie River Enhancement Project Appendix D
To: Dave Bickford/Team Leader

I. Introduction

Purpose:
The purpose of this Biological Evaluation is to review the South Fork McKenzie River Enhancement Project in sufficient detail as to determine whether the proposed action will result in a trend toward Federal listing of any sensitive botanical species.

Botanical Species of Concern:
Current management direction mandates conservation of several categories of rare plants on the Willamette National Forest. Protection of Federally listed Threatened and Endangered species is mandated by the Endangered Species Act. No federally listed Threatened and Endangered, or Proposed plants, are known to occur in the project area. Sensitive species are protected by USDA Forest Service regulations and manual direction (FSM 2672.4).

Prefield reviews are conducted to determine which species from the Regional Foresters 2006 Sensitive Species List for the Willamette National Forest are known from the project area or have suitable habitat present and potentially occur in the project area. Results show no known occurrences of sensitive botanical species within the project area. There is potential habitat for sensitive species in the project area (see Table 1).

II. Description of the Proposed Project

Location:
This project is located on the McKenzie River Ranger District, Willamette National Forest. The project is located at: T.18S., R.5E., Sec. 25, 26, 36; T.18S, R.5 ½ E, Sec. 31, 32, 33; T.19S, R.5E, Sec. 1 and 2; Willamette Meridian.

Proposed Action and Purpose:
The District Ranger on the McKenzie River District proposes to supplement in-stream large woody material in the South Fork McKenzie River and lower Roaring River. Repositioning previously placed restoration wood with implementation of the project would occur. The proposed action includes closure of 12 non-system roads to protect water quality in the project area. Implementation of this proposal, listed within this document as Alternative A, would occur beginning summer 2007.

The purpose for action is to enhance habitat and water quality conditions for spring Chinook salmon and bull trout to meet direction in the Willamette National Forest Plan as amended, and move toward recovery of both Threatened species as directed by the Endangered Species Act.

The need for action was documented in findings of the South Fork McKenzie Watershed Analysis (USFS 1994) where loss of early life habitat for bull trout and spring Chinook salmon in the upper South Fork McKenzie River and lower Roaring River was found. Recommendations from the South Fork McKenzie Watershed Analysis place highest priority on recovery of aquatic habitat in the South

Fork McKenzie River. As a Tier 1 Key Watershed, the South Fork McKenzie River is highest priority under the Northwest Forest Plan for protecting and restoring aquatic habitat.

Alternative A – Proposed Action

The South Fork McKenzie River Enhancement Project (South Fork Project) proposes supplementation of existing woody material to act as flow deflection and develop off-channel habitat. The large woody material (LWM) would be placed in the South Fork McKenzie and Roaring River channel upstream of Homestead Campground. Existing large woody material would be supplemented with trees selected from the adjacent Riparian Reserve, and with imported woody material from nearby upland sources. The collection and staging of LWM from an upland source will be evaluated as part of this project.

Techniques to place the woody material would be used to minimize impacts to other resources. Cables would be used to pull over live trees from the Riparian Reserve. Equipment used to tip live trees would work from Rd 431, Rd 1964 and non-system roads. Following placement of key features, material would be imported using helicopter, or by hand-crews, to form accumulations. Helicopter or hand-crew placement provides full suspension to place imported material and presents minimal disturbance of the river bottom and adjacent riparian area. By importing approximately 280 pieces of LWM, the proposed final density of large woody material would be about 80 pieces in the 8.5 mile enhancement reach.

Forty trees would be utilized from the adjacent Riparian Reserve to serve as "key" features behind which imported material would stabilize. Key features are large diameter trees, with root mass attached, selected for their ability to remain stable during most high flow events. The live trees selected to serve as key features are located at distances from the channel from stream bank to 50 feet from the active channel. The size of tree selected for key features ranges from 22 to 52 inches in diameter at breast height, averaging 32 inches in diameter. The trees selected for restoration of in-stream wood are dispersed through the 8.5 mile enhancement reach on each bank. Twenty-six trees are located along the left bank, looking downstream (Rd 431 and Rd 1964 side), and fourteen along the right bank (Rd 19 side).

Tree tipping would occur during mid-summer and helicopter and/or hand-crew placement would occur following key wood placement, during late summer. All placement activity would occur during the ODFW in-stream work period and outside wildlife restriction periods for the project area, July 15 through August 15, to minimize impacts to wildlife and fisheries. Project implementation is planned to occur beginning in summer season 2007 and is dependent upon equipment and crew availability.

A helicopter landing for refueling and service would be located on Road 985 landing. Road 985 is ¼ mile long, located adjacent to Roaring River. A spill containment structure would be required of potential helicopter use of Rd 985 landing. Restoration material would be staged in landings on Rd 425, Rd 429, Rd 431, Rd 1964 and Rd 414. Restoration material destined for helicopter transport to the enhancement reach would be collected from road-side salvage and existing stockpiles and would consist of whole trees with root-mass intact and root-less tree boles. Enhancement material would be flown directly from the staging areas to the river reach. A Flight Safety Plan and Spill Plan will be required prior to flight operations. Timing requirements for implementation are estimated at 3-4 days for placement of stream adjacent trees and 1-2 days for aerial placement of staged material. Equipment cleaning precautions will be utilized to avoid potential introduction or spread of noxious plants from ground based equipment.

Treatment of 12 non-system roads through barrier placement or campsite delineation would result in alteration of access to 12 dispersed campsites. Road accesses that travel through the South Fork McKenzie and Roaring River floodplains would be modified to exclude vehicle entry into stream channels and wet areas. Treatment would involve delineation of vehicle access using boulders or berms. A seedbed on road surfaces would be prepared through scarification or ripping. Approximately 3,000 feet of road surfaces would be seeded and planted using native plants following

soil preparation. Several campsites require rehabilitation to address degraded site conditions, such as denuded stream banks, eroding soils and drainage problems. Proposed treatments include planting campsite perimeters, drainage improvement and water-barring, and importing organic material to stabilize soils. There would be no change in access to 14 dispersed campsites, with modification of access to 12 dispersed campsites. The 12 dispersed campsites would continue to exist and be accessible to foot traffic.

Alternative B – No Action

The No Action alternative would not implement actions to restore in-stream large woody material in the South Fork McKenzie project area. Aquatic habitat degradation and water quality impacts presented by continuing use of non-system roads in wet areas would continue. This alternative allows existing problems such as low in-stream wood density and simplified habitat to continue untreated and dependant upon natural rates of input to replenish existing condition. Under the No Action alternative, current management plans would continue to guide management of the project area. The No Action alternative provides a basis for describing the environmental effects of the proposed action.

III. Existing Environment

Survey Results:

A survey of the proposed project area for sensitive botanical species was conducted during the summer of 2006 (Table 1). No sensitive botanical species were observed during the survey. Within the entire watershed, there is habitat for Bridgeoporus nobilissimus. However, surveys for this project involved specific trees (to be used in the stream enhancement) and the area of influence around these identified trees; therefore habitat for Bridgeoporus was deemed not to be present in this project. Fungi species were not surveyed for as they require multiple site visits and are deemend impractical to survey for with single predisturbance surveys.

IV. Impacts of the Proposed Project

Direct and Indirect Impacts:

Implementation of this project will have no direct or inderect effect on sensitive botanical species for which surveys are practical or their occupied habitat because sensitive botanical species are not present in the project area. This project involves minimal habitat disturbance for the fungi species deemed impractical to survey for and in my professional oppinion any direct or indirect impacts of this project will not lead to a trend toward listing of those species.

Cumulative Effects:

The proposed action will have no cumulative effects on sensitive botanical species or their occupied habitat because no sensitive botanical species are present in the project area.

V. Determination

It is my determination that implementation of this project will have “no impact” on sensitive botanical species for which surveys are practical because they are not present in the project area. It is my determination that implementation of this project “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”.

Prepared by: _/s/Burtchell Thomas_____ Date: _October 31, 2006____

Burtchell Thomas, Botanist

McKenzie River Ranger District

Table 1: Summary of Potential Habitat and Presence for Botanical Species

Species	**Prefield Review**	**Species Presence**
Agoseris elata	habitat not present	No
Arabis hastatula	habitat not present	No
Arnica viscosa	habitat not present	No
Asplenium septentrionale	habitat not present	No
Aster gormanii	habitat not present	No
Boletus pulcherrimus	habitat not present	No
Botrychium minganense	habitat present	No
Botrychium montanum	habitat present	No
Botrychium pumicola	habitat not present	No
Bridgeoporus nobillisimus	habitat not present	No
Calamagrostis breweri	habitat not present	No
Carex livida	habitat not present	No
Carex scirpoidea var. *stenochlaena*	habitat not present	No
Castilleja rupicola	habitat not present	No
Chaenotheca subroscida	habitat present	No
Cimicifuga elata	habitat present	No
Coptis trifolia	habitat present	No
Cordyceps capitata	habitat not present	No
Cortinarius barlowensis	habitat not present	No
Corydalis aqua-gelidae	habitat present	No
Cudonia monticola	habitat not present	No
Dermatocarpon luridum	habitat present	No
Eucephalis(Aster) vialis	habitat not present	No
Frasera umpquaensis	habitat not present	No
Gentiana newberryi	habitat not present	No
Gomphus kaufmanii	habitat not present	No
Gyromitra californica	habitat not present	No
Hypogymnia duplicata	habitat present	No
Iliamna latibracteata	habitat present	No
Leptogium burnetiae var. hirsutum	habitat present	No
Leptogium cyanescens	habitat present	No
Leucogaster citrinus	habitat not present	No
Lewisia columbiana var. *columbiana*	habitat not present	No
Lobaria linita	habitat present	No
Lycopodiella inundata	habitat not present	No
Montia howellii	habitat not present	No
Mycenia monticola	habitat not present	No
Nephroma occultum	habitat present	No
Ophioglossum pusillum	habitat not present	No
Pannaria rubiginosa	habitat present	No
Pellaea	habitat not present	No

andromedaefolia		
Peltigera neckeri	habitat present	No
Peltigera pacifica	habitat present	No
Phaecollybia attenuata	habitat not present	No
Phaeocollybia dissiliens	habitat not present	No
Phaeocollybia pseudofestiva	habitat not present	No
Phaeocollybia sipei	habitat not present	No
Pilophorus nigricaulis	habitat present	No
Polystichum californicum	habitat not present	No
Potentilla villosa	habitat not present	No
Pseudocyphellaria rainierensis	habitat present	No
Ramalina pollinaria	habitat not present	No
Ramaria amyloidea	habitat not present	No
Ramaria aurantiisiccescens	habitat not present	No
Ramaria largentii	habitat not present	No
Rhizomnium nudum	habitat present	No
Romanzoffia thompsonii	habitat present	No
Scheuchzeria palustris var. *americana*	habitat not present	No
Schistostega pennata	habitat present	No
Sisyrinchium sarmentosum	habitat not present	No
Sowerbyella rhenana	habitat not present	No
Tetraphis geniculata	habitat present	No
Thorluna disimilis	habitat present	No
Usnea longissima	habitat present	No
Utricularia minor	habitat not present	No
Wolffia borealis	habitat not present	No
Wolffia columbiana	habitat not present	No

ATTACHMENT 1: **Regional Forester's Sensitive Plant List for the Willamette National Forest (Revised 2001).** Species of federal, state and local importance are included on the R-6 list.

Species	Occurrence on WNF	ONHP Status	State Status	Federal Status	Habitat Types
Agoseris elata	S	2			MM,DM
Arabis hastatula	D	1		SofC	RO
Arnica viscosa	S	2			RS
Asplenium septentrionale	S	2			RO
Aster gormanii	D	1			RS
Boletus pulcherrimus	D	1			CF
Botrychium minganense	D	2			RZ,CF
Botrychium montanum	D	2			RZ,CF
Botrychium pumicola	S	1	LT		HV
Bridgeoporus nobilissimus	D	1			CF
Calamagrostis breweri	D	2			MM,RZ
Carex livida	S	2			WM
Carex scirpoidea var. stenochlaena	D	2			RO
Castilleja rupicola	D	2			RO
Chaenotheca subroscida	D	3			CF
Cimicifuga elata	D	1	C		CF
Coptis trifolia	S	2			WM,CF
Cordyceps capitata	D	unlisted			CF
Corydalis aqua-gelidae	D	1	C		RZ,CF
Cudonia monticola	D	not listed			CF
Dermatocarpon luridum	S	3			RZ on rock
Eucephalis (Aster) vialis	S	1	LT	SofC	CF
Frasera umpquaensis	D	1	C		MM
Gentiana newberryi	D	2			MM
Gomphus kaufmanii	D	3			CF
Gyromitra californica	D	2			CF
Hypogymnia duplicata	S	3			CF
Iliamna latibracteata	S	2			CF,RZ
Leptogium burnetiae var. hirsutum	S	3			CF
Leptogium cyanescens	D	3			CF
Leucogaster citrinus	D	3			CF
Lewisia columbiana var. *columbiana*	D	2			RS
Lobaria linita	D	2			RO
Lycopodiella inundata	D	2			WM
Lycopodium complanatum	D	2			CF
Montia howellii	D	4	C		RZ
Mycenia monticola	D	not listed			CF
Species	**Occurrence on WNF**	**ONHP Status**	**State Status**	**Federal Status**	**Habitat Types**
Nephroma occultum	D	4			CF
Ophioglossum pusillum	D	2			WM

Pannaria rubiginosa	D	2			CF
Pellaea andromedaefolia	S	2			RO
Peltigera neckeri	D	not listed			CF
Peltigers pacifica	D	not listed			CF
Phaeocollybia attenuata	D	4			CF
P. dissiliens	D	3			CF
P. pseudofestiva	D	3			CF
P. sipei	D	3			CF
Pilophorus nigricaulis	D	2			RO
Polystichum californicum	D	2			RO
Potentilla villosa	D	2			RS, RO
Pseudocyphellaria rainierensis	D	4			CF,RZ
Ramalina pollinaria	D	2			CF, RZ
Ramaria amyloidea	D	2			CF
R. aurantiisiccescens	D	4			CF
R. largentii	D	3			CF
Rhizomnium nudum	D	2			CF
Romanzoffia thompsonii	D	1			RS
Scheuchzeria palustris var. americana	D	2			WM
Schistostega pennata	D	2			CF
Sisyrinchium sarmentosum	S	1	C	SofC	MM,DM
Sowerbyella rhenana	D	3			CF
Tetraphis geniculata	S	2			CF
Thorluna disimilis	D	2			CF
Usnea longissima	D	3			CF,RZ
Utricularia minor	D	2			SW
Wolffia borealis	S	2			SW
Wolffia columbiana	S	2			SW

ATTACHMENT 2:

Conclusions Of Effects For Use In Biological Evaluations and Assessments
USDA Forest Service - Regions 1, 4, and 6
August, 1995

Listed Species:

1. No Effect

   Occurs when a project or activity will not have any "effect", on a listed species, or critical habitat.

2. May Affect - Likely to Adversely Affect (LAA)

   If the determination in the biological assessment is that the project May Affect - Likely to Adversely Affect a listed species or critical habitat, formal consultation must be initiated (50 CFR 402.12). Formal consultation must be requested in writing through the Forest Supervisor (FSM 2670.44) to the appropriate FWS Field Supervisor, or NOAA Fisheries office.

3. May Affect - Not Likely to Adversely Affect (NLAA)

   If it is determined in the biological assessment that there are "effects" to a listed species or critical habitat, but that those effects are not likely to adversely affect listed species or critical habitat, then written concurrence by the FWS or NOAA Fisheries is required to conclude informal consultation (50 CFR 402.13).

4. Beneficial Effect

   Written concurrence is also required from the FWS or NOAA Fisheries if a beneficial effect determination is made.
   Requests for written concurrence must be initiated in writing from the Forest Supervisor to the State Field Supervisor (FWS or NOAA).

Proposed Species:

Whenever serious adverse effects are predicted for a proposed species or proposed critical habitat, conferencing is required with the FWS or NOAA Fisheries.

1. No Effect

   When there are "no effects" to proposed species, conferencing is not required with FWS or NOAA.

2. Not Likely to Jeopardize the Continued Existence of the Species or Result in Destruction or Adverse Modification of Proposed Critical Habitat

   This conclusion is used where there are effects or cumulative effects, but where such effects would not have the consequence of losing key populations or adversely affecting "proposed critical habitat". No conferencing is required with FWS or NOAA if this conclusion is made. However, for any proposed activity that would receive a "Likely To Adversely Affect" conclusion if the species were to be listed, conferencing may be initiated.

3. Likely to Jeopardize the Continued Existence of the Species or Result in Destruction or Adverse Modification of Proposed Critical Habitat

   This conclusion must be determined if there are significant effects that could jeopardize the continued existence of the species, result in adverse modification or destruction of proposed critical habitat, and/or result in irreversible or

irretrievable commitments of resources that could foreclose options to avoid jeopardy, should the species be listed. If this is the conclusion, conferencing with FWS or NMFS is required.

Sensitive Species:

1. No Impact (NI)

A determination of "No Impact" for sensitive species occurs when a project or activity will have no environmental effects on habitat, individuals, a population or a species.

2. 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)

Activities or actions that have effects that are immeasurable, minor or are consistent with Conservation Strategies would receive this conclusion. For populations that are small - or vulnerable - each individual may be important for short and long-term viability.

3. Will Impact Individuals or Habitat With a Consequence That the Action May Contribute to a Trend Towards Federal Listing or Cause a Loss of Viability to the Population or Species (WIFV)

Loss of individuals or habitat can be considered significant when the potential effect may be:

1. Contributing to a trend toward Federal listing (C-1 or C-2 species);
2. Results in a significantly increased risk of loss of viability for a species; or,
3. Results in a significantly increased risk of loss of viability for a significant population (stock).

4. Beneficial Impact (BI)

Projects or activities that are designed to benefit, or that measurably benefit a sensitive species should receive this conclusion.

Appendix E

United States Department of Agriculture | **Forest Service** | **Willamette National Forest**
McKenzie River Ranger District
57600 McKenzie Hwy
McKenzie Bridge, OR 97413
Tel (541) 822-3381
FAX (541) 822-7254

File Code: 2670 Botany

Date: October 31, 2006

Subject: Supplemental Botany Report: South Fork McKenzie River Enhancement Appendix E

To: Dave Bickford/Team Leader

Introduction

This document serves as the Botanical Resource Report for the South Fork McKenzie River Enhancement Project on the McKenzie River Ranger District, Willamette National Forest. The project is located at: T.18S., R.5E., Sec. 25, 26, 36; T.18S, R.5 ½ E, Sec. 31, 32, 33; T.19S, R.5E, Sec. 1 and 2; Willamette Meridian.

Survey and Manage

On January 9, 2006 Judge Pechman signed an Order on Plaintiffs' Motion for Injunctive Relief that set aside the March 22, 2004 Survey and Manage ROD, reinstated the January 2001 Survey and Mange ROD, and instructed affected Forest Service and Bureau of Land Management units to "not authorize, allow, or permit to continue any logging or other ground disturbing activities on projects to which the 2001 ROD applied unless such activities are in compliance with the provisions of the 2001 ROD (as the 2001 ROD was amended or modified as of March 21, 2004).

To comply with this order, Forest Service and Bureau of Land Management units are required to survey for 2001 ROD (amended March 2004) Category A and C species. Intuitive-controlled field surveys in 2000 and 2001 followed up the prefield review to determine presence of sensitive plant species within those special habitat areas, as well as other potential habitats.

Survey and Manage botanical species are species that are genuinely rare or, because of lack of information about them, the agencies did not know whether they would adequately be protected by other elements of the Northwest Forest Plan. The list of species that have potential habitat within the planning area and Survey and Manage species located in the planning area can be found in the Botanical Resource Report located in Appendix C.

In 2004, the Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines was released (USDA Forest Service and USDI Bureau of Land Management. 2004a). As a result, some of the species that were formerly Survey and Manage are now managed under the interagency Special Status Species Program (SSSP) as sensitive species.

A pre-field review of the project area was conducted to determine the presence of potential habitat for former Survey and Manage species. Surveys were conducted July and August 2006 in these potential habitats.

No Survey and Manage species were located.

Noxious Weeds

This project poses a concern for the introduction and spread of noxious weeds due to the possible use of ground disturbing equipment and creation of disturbed bare ground. The following measures will be used to mitigate the potential introduction of noxious weeds.

- All equipment used to open the old side channel will be cleaned prior to use on the project to ensure that all equipment is free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds of noxious weeds. Vehicle cleaning specifications will be written into the contract for vehicular traffic.

- Bare soil will be rehabilitated with native vegetation appropriate for the area and designated weed-free mulch materials. This would include, but not be limited to, upgraded dispersed recreation sites, closed roads, helicopter staging platform, and vehicular access points to the McKenzie River. It would not be appropriate to spread native grass seed over the entire disturbed area. Some native grass seed may be spread, but the majority of the vegetation should be mosses, forbs, ferns, and shrubs. This vegetation may be transplanted from the surrounding area if surveys deem no sensitive or survey and manage species located there.

- Monitor the project area for three years for noxious weeds.

Prepared by: /s/Burtchell Thomas Date: October 31, 2006
Burtchell Thomas, Botanist
McKenzie River Ranger District

Results of Prefield Review and Field Reconnaissance for Survey and Manage Plant Species

Willamette National Forest FY 2007

Project Name: South Fork McKenzie River Enhancement Unit #(s):

Legal: T.18S., R.5E., Sec. 25, 26, 36; T.18S, R.5 ½ E, Sec. 31, 32, 33; T.19S, R.5E, Sec. 1 and 2.

Is the project ground disturbing? **Yes X (if yes, then conduct survey)**
No _____ (if no, then document in project file)

Species	Habitat Present? (Y/N)	Date Surveyed	Surveyor(s) Name(s)	Species Located? (Y/N)	Additional Survey Needs? When and Where?
***[1]Botrychium minganense**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Botrychium montanum**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Bridgeoporus nobilissimus**	**N**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Castilleja rupicola**	**N**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Chaenotheca subroscida**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Coptis trifolia**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Corydalis aqua-gelidae**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Cypripedium montanum**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Dendriscocaulon intricatulum**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Dermatocarpon luridum**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Eucephalus vialis**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Hypogymnia duplicata**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Leptogium burnetiae var. hirsutum**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Leptogium cyanescens**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Lobaria linita var. tenuoir**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Lycopodium complanatum**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Nephroma occultum**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Pannaria rubiginosa**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Peltigera neckeri**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Peltigera pacifica**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**

[1] * Starred species are also on the Willamette NF Sensitive Species List

***Pilophorus nigricaulis**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Pseudocyphellaria rainierensis**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Ramalina pollanaria**	**N**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Rhizomnium nudum**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Schistostega pennata**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Tetraphis geniculata**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Thorluna disimilis**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**
***Usnea longissima**	**Y**	**Jul-Aug 2006**	**B.Thomas**	**N**	**None**

Signature:

/s/Burtchell Thomas
Botanist

October 31, 2006
Date