

# **ENVIRONMENTAL ASSESSMENT**

## **Upper McKenzie River Aquatic Restoration Project**

McKenzie River Ranger District  
Willamette National Forest  
Linn County, Oregon

February 2004

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### Table of Acronyms

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
EFH	Essential Fish Habitat
ESA	Endangered Species Act
EWEB	Eugene Water & Electric Board
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
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

# I. PURPOSE AND NEED FOR ACTION

This environmental assessment is written to fulfill the purposes and requirements of the National Environmental Policy Act (NEPA), as well as to meet policy and procedural requirements of the USDA Forest Service. The intent of NEPA, its implementing regulations, and Forest Service policy is to evaluate and disclose the effects of proposed actions on the quality of the human environment. The intent of these procedures is to improve the quality of decision-making, as well as make the decision-making process more accessible and transparent to the affected public.

## INTRODUCTION

The Upper McKenzie River Aquatic Restoration Project Area is located on McKenzie River Ranger District of the Willamette National Forest (Figure I-1). The proposed restoration project would be located in the McKenzie River channel within the Upper McKenzie River Watershed. Proposed actions would occur in the McKenzie River reach located immediately upstream (north) of Trail Bridge Reservoir, ending just north of the confluence of Kink Creek with the McKenzie River, a distance of 1.0 mile. The river elevations range from 2,200 ft. at Trail Bridge Reservoir, to 2,250 ft. near Kink Creek confluence with the McKenzie River.

The Upper McKenzie Aquatic Restoration Project originated with scoping at the District level in March of 1999, as part of the Two Bee Landscape Management Project. The Upper McKenzie Aquatic Restoration Project was subsequently separated from the Two Bee Landscape Project and is evaluated as an individual project in this Environmental Analysis. The legal description of the project area: T.15S., R.6E., Section 1.

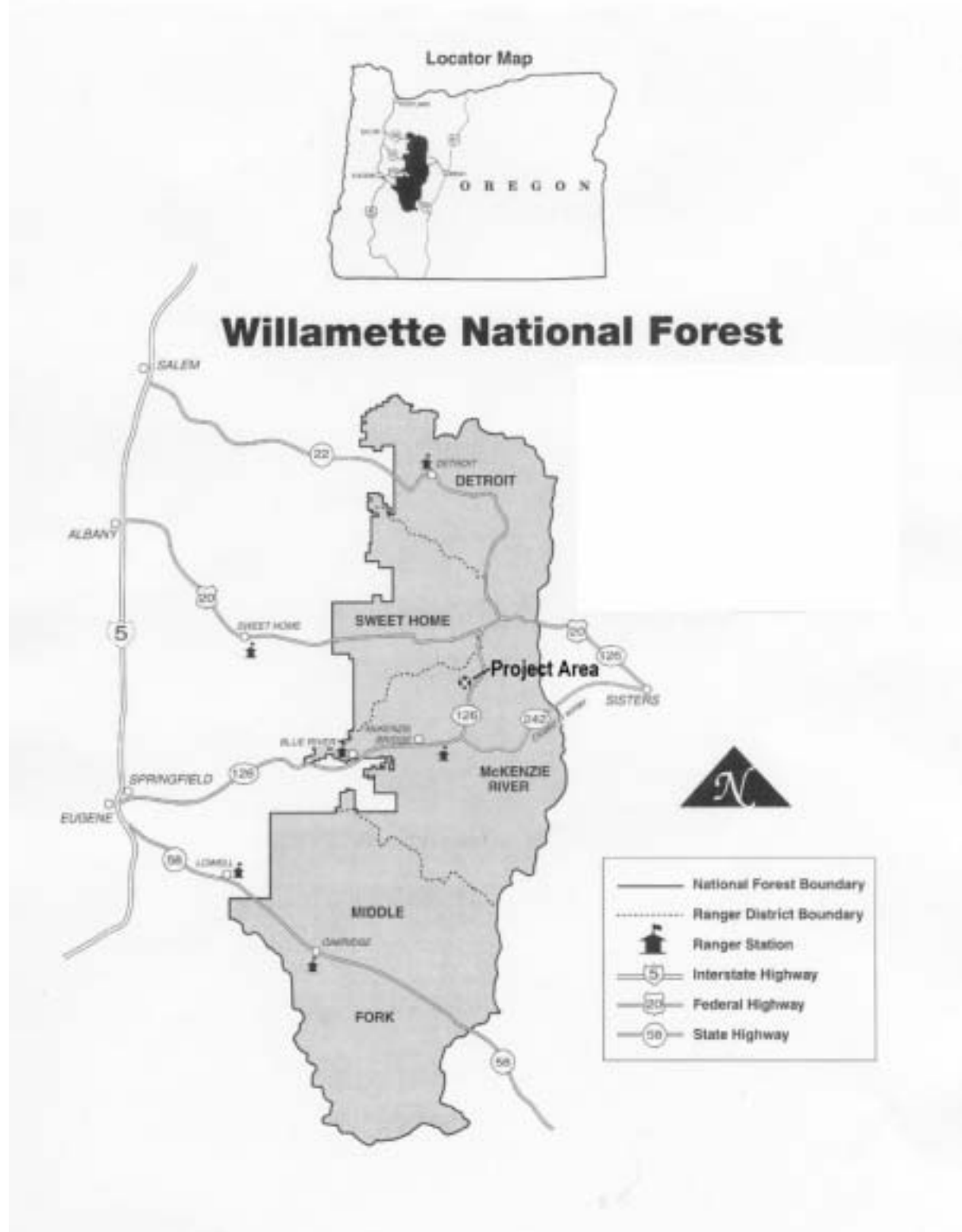
### **Proposed Action**

The District Ranger on the McKenzie River District proposes to supplement in-stream large woody material in the Upper McKenzie River, upstream of Trail Bridge Dam. If, following monitoring of large woody material effectiveness, spawning gravels are not recruited in sufficient quantities, spawning-sized substrates would be imported into the restoration reach. Implementation of this proposal, listed within this document as Alternative B, would occur over five years.

## PURPOSE AND NEED

The purpose of this project is to restore aquatic habitat in the Upper McKenzie River in a manner consistent with the Northwest Forest Plan Aquatic Conservation Strategy. A need exists because of a deficiency in spawning and rearing habitat for two species listed under the Endangered Species Act (ESA): bull trout (*Salvelinus confluentus*) and Upper Willamette spring chinook salmon (*Oncorhynchus tshawytscha*). Factors limiting the reproductive and early life survival of both species have been identified through aquatic habitat surveys and are described in this analysis.

Figure I-1. Vicinity Map



## **DECISION FRAMEWORK**

The McKenzie River District Ranger will decide which of the alternatives, if any, meets the purpose and need to restore aquatic habitat in the Upper McKenzie River. The decision maker, in a Decision Notice and Finding of No Significant Impact (DN/FONSI), shall document his or her rationale for selecting an alternative from this assessment, or any other action, and will establish findings from this assessment as required by NEPA. The Decision Notice should address consistency with the Willamette Forest Plan amended by the Northwest Forest Plan, and Upper McKenzie River Watershed Analysis. The proposed project follows the recommendations of the Upper McKenzie River Watershed Analysis in improving spawning and rearing habitat for bull trout and spring chinook salmon in the mainstem McKenzie River, including above Trail Bridge Reservoir.

## **THE FOREST PLAN**

This Upper McKenzie River Aquatic Restoration Project Environmental Assessment (Upper McKenzie EA) is tiered to the 1990 Willamette National Forest Land and Resource Plan. The 1990 Forest Plan resulted from the extensive analysis and considerations addressed in the accompanying Final Environmental Impact Statement (FEIS) and Record of Decision (ROD). The Willamette Forest Plan was substantially amended in 1994 and 2001. In April 1994, the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Spotted Owl, April 1994 (USDA, USDI Northwest Forest Plan ROD, 1994) modified the Willamette Forest Plan with overlaying management areas and their accompanying standards and guidelines.

In January 2001, the Willamette Forest Plan was further amended by the Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (USDA, USDI Survey and Manage ROD, 2001). This Record of Decision amended a portion of the Northwest Forest Plan by adopting new standards and guidelines for Survey and Manage, Protection Buffers and other mitigating measures. Since that amendment was made, surveys for all applicable Survey and Manage species required by this amendment have been completed within the Upper McKenzie Project area.

## **WATERSHED ANALYSIS**

The Aquatic Conservation Strategy in the Northwest Forest Plan includes two designations for Key Watersheds: Tier 1 and Tier 2. The proposed project area is located within the Upper McKenzie Watershed. The portion of the watershed that lies directly upstream of Trail Bridge Reservoir is classified as a Tier 1 Key Watershed, which has a conservation emphasis.

The Upper McKenzie Watershed Analysis, completed in August 1995, developed and documented a scientifically based understanding of the processes and interactions occurring within the watershed. The Upper McKenzie River contributes directly to conservation of Endangered Species Act (ESA) listed Upper Willamette spring chinook salmon and bull trout, and aquatic species. 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. The Aquatic Conservation Analysis, Appendix A, addresses the Aquatic Conservation Strategy objectives and this proposed action.

## **MANAGEMENT AREAS**

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 I-1 below displays Management Areas within the Upper 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, and Matrix.

<b>Table I-1. Willamette Forest Plan Management Areas in the Upper McKenzie Project Area</b>	
Willamette Forest Plan Management Areas	Northwest Forest Plan Land Allocations
MA-6c – McKenzie River Wild & Scenic River (Recreation)	Administratively Withdrawn
MA-11f – Scenic – Retention Foreground	Matrix
MA-15 – Riparian Area	Riparian Reserve

## **MA-6C, DESIGNATED WILD AND SCENIC RIVER – MCKENZIE RIVER**

### **Wild and Scenic Rivers Act:**

The McKenzie River is designated as a Wild and Scenic River (WSR) with a “Recreation” River Class, because it possesses numerous outstandingly remarkable values such as: prominent recreational opportunities, spectacular scenery, unique geological attributes, and diverse fish populations and habitat. In 1993, the Upper McKenzie River Wild and Scenic River Plan and accompanying Environmental Assessment were completed to comply with law established by the 1968 National Wild and Scenic Rivers Act. This comprehensive River Management Plan tiered to the 1990 Willamette Forest Plan.

The Upper McKenzie River is divided into three WSR segments: A, B, and C. Segment A is a 1.8 mile segment from Clear Lake to the head of maximum pool at Carmen Reservoir. Segment B is a 4.3 mile segment from a point 100 feet downstream from Carmen Dam to the maximum pool at Trail Bridge Reservoir. Segment C is a 6.6 mile segment from the developments at the base of the Trail Bridge Reservoir Dam to Scott Creek. The proposed in-stream restoration would occur in the channel and Riparian Reserve of Segment B. An analysis of potential project effects to the outstandingly remarkable values of the Wild and Scenic River (Section 7 Wild and Scenic River analysis) will occur with this project proposal.

## **OREGON STATE SCENIC WATERWAY**

Segments of the McKenzie River within this project area are also within portions of the Oregon State Scenic Waterway, administered by the Oregon State Parks and Recreation Commission. The state scenic waterway segments have a dual classification. The west side of the McKenzie River is classified as Scenic River Area, and the east side of the river is classified as Recreation River Area. The Scenic Waterway Act and Commission rules require the evaluation of proposed development within ¼ mile from each side of the river. An analysis of potential project effects to the outstandingly remarkable values of the Wild and Scenic River (Section 7 Wild and Scenic River analysis) will occur with this project proposal. Concurrence of project effects with Oregon State Parks and Recreation Division is necessary through Section 7 Wild and Scenic River analysis, prior to project implementation.



## **MA-11F SCENIC – RETENTION FOREGROUND**

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

This management area is located along State Highway 126 and within the foreground of the National Scenic Byway system. Portions of the project are proposed to occur within MA-11f.

## **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. 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. An assessment on how all alternatives meet the ACS can be found in Appendix A.

## **SIGNIFICANT ISSUES**

Scoping is the process for determining issues relating to a proposed action and includes review of written comments, distribution of information about the project, Interdisciplinary Team (IDT) meetings and correspondence with the public, Tribes, government agencies, and elected officials (see Chapter V, Consultation with Others).

Scoping occurred both internally and externally (see Chapter IV. Consultation With Others). The IDT, through their internal scoping process, identified issues. 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 each alternative. The Significant Issues are tracked through issue identification (in this Chapter) and environmental consequences in Chapter III.

### **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 turbidity. Importation of spawning substrate (lower drainage gravels used as restoration substrate in the upper drainage) has the potential of introducing pathogens foreign to the upper McKenzie River.

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 potential changes in aquatic habitat quality affecting listed species, the following will be analyzed:

Criteria: Change in spawning habitat availability to listed species.  
Unit of Measure: Cubic yards of suitable spawning substrate.

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

Unit of Measure: Brown's model evaluation of changes in available stream shade and potential increases in river temperature.  
Unit of Measure: Degrees Fahrenheit change.

## **2. Threatened, Endangered, Sensitive Plant and Wildlife Species**

Proposed actions may affect sensitive plant and animal species through disturbance or alteration of habitat. To evaluate these effects, the following will be analyzed:

Criteria: Amount of forest habitat removed or degraded and potential disturbance to TES species.  
Unit of Measure: Acres of habitat altered. Timing of noise disturbance.

## **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. Hydroelectric Operations**

Carmen Diversion and Trail Bridge Reservoir and a hydroelectric plant, part of Eugene Water & Electric Board's Carmen-Smith Project, are located upstream and downstream of the proposed project area. Proposed activities could potentially interfere with reservoir operation through the migration of restoration material (large woody material). These effects can result in increased reservoir maintenance costs. Eugene Water & Electric Board conducts periodic maintenance of the reservoir surface, sweeping it of floating debris, generally deposited during flood events, to reduce interference with hydroelectric operations. This issue is not significant to the proposed action due to the action agency's responsibility for material placed during restoration. The Forest Service will be responsible for removal of restoration material that migrates to Trail Bridge Reservoir.

## **4. Recreation**

The proposed activities could alter the forested landscape and affect recreation experience, and may adversely or beneficially affect the opportunity for a high quality recreational experience within the project area. This issue is not significant to the proposed action because the project will result in minor, short-term impacts to recreation resources in the area.

## **5. Visual Quality**

Visual quality in MA-11f areas may be impacted by proposed activities because of openings created from the felling of riparian reserve trees. The viewshed of the project area contains the Upper McKenzie Wild and Scenic River corridor (MA-6c) and Oregon State Scenic Waterway, which follow the McKenzie River from Trail Bridge Reservoir to Clear Lake. This issue is not significant to the proposed action because: Removal of a limited number of riparian reserve trees within MA-6c and MA-11f would not create significant openings. Consistency with the Visual Quality Objectives of Scenic Retention Foreground would be maintained.

## **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 the desirable native vegetation. Six noxious weeds and twenty-six non-native plant species occur in the watershed. The noxious weed spotted knapweed (*Centaurea maculosa*) 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 State Highways 126 and U.S. Highway 20.

This issue is not significant to the proposed action because: Prevention measures would be used to prevent expansion of existing populations. Control under the Willamette National Forest Integrated Weed Management Environmental Assessment (WNF 1999) provides for on-going treatment of the existing populations. Control methods used in the watershed include manual removal, equipment inspection and operating procedures, release of beneficial insects that feed on the seed heads of specific noxious weed species, and the selected use of herbicides.

## **7. Soil Erosion**

Ground disturbance that occurs during tree felling 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 because: Ground-disturbing equipment would remain on roads and be prohibited in riparian reserves and the geographic extent of the project is small.

## **8. Management Indicator Species, Neotropical Migratory Land Birds, Survey and Manage Species, Protection Buffer Species, and Other Mitigation Species**

Habitat disturbance that occurs from tree felling may result in changes to habitat for these species. This issue is not significant to the proposed action because: Management Indicator Species (MIS) were addressed in the WNF LRMP (1990). They include the spotted owl, pileated woodpecker, marten, elk, deer, cavity excavators, bald eagles, peregrine falcons, and angled-for fish such as rainbow 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 the MIS. Management recommendations to ensure their viability were incorporated into all WNF Plan Action Alternatives. Both Alternatives A and B meet all applicable Standards and Guidelines from the WNF Plan. The amount or characteristics of required habitat for these species would not be not significantly changed. With the 1994 and 2001 Amendments to the WNF Plan (i.e. the Northwest Forest Plan, NWFP), persistence of populations would be maintained under the NWFP Standards and Guidelines (Appendix J2). The proposed action meets applicable Standards and Guidelines from the NWFP.

Neotropical Migratory Birds and their required protection are outlined in the January 11, 2001 Executive Order “Responsibilities of Federal Agencies to Protect Migratory Birds.” Habitats vary broadly for this large group of species. The felling of a limited number of trees with this project may unintentionally take individual migratory birds, but is not expected to have a measurable negative effect on bird populations because of the limited extent of the habitat removal. The action would occur outside the nesting season of most neotropical migratory birds (after July 15 through March 1) to further mitigate losses. Survey and Manage Species, Protection Buffer, and Other Mitigation Species were surveyed for as necessary. Where they were found, no proposed activity will occur. Appendix C and D describes this in more detail.

## **9. Cultural Resources**

Surveys within this landscape have documented cultural resource sites. They may be impacted by the proposed ground-disturbing activities. This issue is not significant to the proposed action because: The project site has been surveyed and no cultural resources were found. Avoidance of inadvertent discovery sites would be required during project implementation. The District Archeologist would evaluate inadvertent discoveries.

## II. ALTERNATIVES

Using the Willamette National Forest Plan as amended by the Northwest Forest Plan and the Watershed Analysis as the framework, the interdisciplinary team designed three alternatives: a “No Action” and two “Action” Alternatives. The Action Alternatives are designed to meet the Purpose and Need as described in Chapter I and addresses the significant issues. The “No Action” Alternative is required by Federal law (National Environmental Policy Act, 1969). The No Action Alternative provides the baseline from which effects of other alternatives can be compared and measured.

### LEGAL REQUIREMENTS

The alternatives for this project were designed to comply with the following:

Federal Laws:

The Preservation of Antiquities Act, June 1906 and National Historic Preservation Act, October 1966 – Field surveys where ground-disturbing activities would occur have been completed. A Determination of No Effect Report for the proposed action will be submitted to the Forest Specialist for transmittal to the State Historic Preservation Office (per the 1995 Programmatic Agreement between the Forest Service and SHPO).

The National Environmental Policy Act (NEPA), 1969 – NEPA establishes the format and content requirements of environmental analysis and documentation. Preparation of the Upper McKenzie EA is in compliance with these requirements.

The Endangered Species Act (ESA), December 1973 – The ESA establishes a policy that all federal agencies will 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 (Appendix C and D). A Biological Assessment was prepared for threatened fish (Appendix B).

The National Forest Management Act (NFMA), 1976 – The alternatives were developed to be in full compliance with NFMA through compliance with the Amended Willamette National Forest Land and Resource Management Plan (US Forest Service, 1990).

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.

The Clean Water Act, 1987 – The alternatives meet and conform to the Clean Water Act, Amended 1987. This act establishes a non-degradation policy for all federally proposed projects. The selected alternative is not likely to degrade water quality below standards set by the State of Oregon. This would be accomplished through planning, application and monitoring of Best Management Practices (BMPs). Magnuson-Stevens Fishery Conservation and Management Act, 1976 (MSA) – Alternatives in this proposal are designed to meet the provisions of the MSA requiring conservation of Essential Fish Habitat important to fishery resources that are fished commercially (spring chinook salmon in the Upper McKenzie project area).

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

Wild and Scenic Rivers Act, 1968 – Alternatives in this proposal are designed to maintain the Outstandingly Remarkable Values (ORV's) of the Upper McKenzie River Wild and Scenic River. A Section 7 Analysis evaluates potential project effects on the free-flowing character and ORV's of the Upper McKenzie Wild and Scenic Area (Appendix E).

Best Management Practices (BMPs), 1988 – Forest Service BMPs would be employed to maintain water quality.

State Laws:

Consultation with the Oregon State Historic Preservation Officer (SHPO) has occurred (see above).

Consultation with the Oregon State Parks and Recreation Division about potential effects to the State Scenic Waterway, through Section 7 Analysis has occurred (Appendix E).

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 action alternative.

## Alternatives Considered in Detail

### **ALTERNATIVE A**

The Upper McKenzie River Aquatic Restoration Project proposes supplementation of existing woody material to act as flow deflection and capture spawning gravels. The large woody material (LWM) would be placed in the McKenzie River channel upstream of Trail Bridge Dam (Figure II-1). 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 has been evaluated in a separate project analysis (Carmen Air Quality Site Project; Decision on 27 September 2002; McKenzie River Ranger District). The purpose of importing woody material is to supplement an existing low density of large woody material in the main stem McKenzie River above Trail Bridge Reservoir. Currently, the density is 7 pieces of large wood per mile (>24 inch diameter by 50 foot length) in the restoration reach. The reach between Trail Bridge Reservoir to near Kink Creek confluence, approximately 1.0 mile long, is known spawning habitat for bull trout isolated above Trail Bridge Dam and spring chinook salmon transported above the dam by Oregon Department of Fish and Wildlife (ODFW). The low volume of sources of flow deflection and low quantities of gravel accumulation limits opportunity for spawning bull trout and spring chinook salmon. Desired densities of LWM are about 80 pieces of woody material per mile.

Techniques to place the woody material would minimize impacts to other resources. Cables would be used to pull over live trees from the riparian reserve ("key features" providing stability for wood accumulations). Equipment used to tip live trees would work from Rd. 735. Following placement of key features, material would be imported using helicopter to form an accumulation. Helicopter placement provides full suspension to place imported material and avoids disturbance of the river bottom and adjacent riparian area. By importing approximately 50 pieces of LWM, the proposed final density of large woody material would be about 80 pieces in the 1.0 mile reach.

Seventeen trees would be selected 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 17 live trees, serving as key

features, would be pulled over from the Riparian Reserve, located at distances of 20-70 feet from the active channel. The size of tree selected for key features ranges from 15.5 to 59 inches in diameter at breast height, averaging 32.8 inches in diameter. The 17 trees selected for restoration of in-stream wood are dispersed through the 1.0 mile reach on each bank. Twelve trees are located along the right bank, looking upstream (Highway 126 side), and five along the left bank. Once key features are in place in the channel, helicopter placement of imported material from Smith Ridge would occur. Project implementation would occur during two years for wood placement. Tree tipping would occur during summer 2004, and helicopter placement during summer 2005. Material would be added to each key piece of woody material, to mimic natural accumulations or jams. Woody material jams will consist of 4-6 pieces in off-bank accumulations. Several opportunities exist for channel spanning accumulations.

A helicopter landing for refueling and service would be located on Road 683. Road maintenance of the existing road would be required to access the service landing. Road 683 is ¼ mile long, located on Smith Ridge. Road maintenance would consist of brushing vegetation bordering the existing road bed, and leveling the road surface using a grader. Restoration material will be staged near Carmen Air Quality Station, on Smith Ridge (along Rd 655), about 0.5 mile west of the restoration reach, and 0.3 mile south of the service landing. Restoration material destined for helicopter transport to the restoration reach would be collected from existing stockpiles and primarily consist of whole trees with root-mass intact. Restoration material would be flown directly from the staging site to the restoration reach. A Flight Safety Plan and Spill Plan will be required prior to flight operations. Timing requirements for implementation are estimated at three days for placement of stream adjacent trees (summer 2004) and 1-2 days for aerial placement of staged material (summer 2005). Equipment cleaning precautions will be utilized to avoid potential introduction of noxious plants from ground based equipment. Seasonal operation restrictions will be used to avoid disturbance of wildlife and fisheries resources.

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. As a portion of restoration material is expected to migrate in response to extreme high flow events and potentially interfere with EWEB hydroelectric projects, the Forest Service will be responsible for removal of material of restoration origin that migrates to Trail Bridge Reservoir. All material in the restoration reach of natural and human-placed origin will be identified with tags by Oregon State University researchers. OSU researchers plan to examine wood, substrate and channel response to restoration effort. A pre-project examination of the restoration reach was made by the OSU researchers in anticipation of the project and existing large wood was tagged during that survey (September 2001).

## **ALTERNATIVE B – PROPOSED ACTION**

Alternative B proposes the identical supplementation of woody material described in Alternative A, with supplementation of spawning substrate in addition to wood placement action. Following placement of large wood, channel substrates will be monitored annually (12 channel cross-sections measured once per year) to determine if sufficient gravels for spawning spring chinook salmon and bull trout are recruited by woody material accumulations. If sufficient material does not accumulate, gravels will be supplemented by importing gravel alluvium. The decision to supplement spawning gravel would be made at the end of Year 4 (2007) monitoring, with Year 1 representing the first year of project implementation (2004) and LWD placement. Placement of gravel would occur near placed wood accumulations using a full suspension bucket, provided by ground-based yarding equipment, or helicopter. Sufficient gravel is defined as 12 cubic yards of material suitable as spawning habitat for spring chinook or bull trout (1 to 4 inch in diameter) upstream and downstream of each large wood accumulation. Importation of gravel material would supplement recruited materials to achieve a 12 cubic yard gravel accumulation in the vicinity of each large wood accumulation.

Spawning gravels would be purchased from a commercial gravel source, off-forest. Imported spawning gravels will not require off-site treatment to neutralize potential pathogens prior to importation to the project site. Currently, ODFW transports spring chinook salmon above Trail Bridge Reservoir and potential lower river pathogens are expected to have been provided that avenue of transmission already. Spawning gravels would require cleaning and sorting prior to transport for use in the upper McKenzie River, to remove fine sediments and noxious weed seeds. Implementation of aerial placed spawning substrates would occur from the helicopter landing on Rd 683, as wood placement is described in Alternative A, or by ground-based equipment placement from Rd 735 surface using suspended bucket. Equipment cleaning precautions would be utilized to avoid potential introduction of noxious plants. Seasonal operation restrictions would be used to avoid disturbance of wildlife and fisheries resources.



Figure II-1. Project Area



## **ALTERNATIVE C – NO ACTION**

Alternative C – No Action, would not implement actions to restore in-stream large woody material or gravel substrate in the Upper McKenzie project area. 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. Slow rates of natural large wood input are not expected to compensate for missing elements of habitat complexity. This alternative would not meet the purpose and need of the project proposal. The No Action alternative provides a basis for describing the environmental effects of the proposed action and other alternatives.

## **MITIGATION MEASURES FOR ALL ACTION ALTERNATIVES**

The following list describes the mitigation measures that would be applied in the implementation of the either Alternative A or B.

### **Soil, Watershed, and Fisheries Protection:**

Road maintenance would be done during periods of dry ground conditions to minimize erosion and sedimentation (there are no stream crossings are located on Rd 683).

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.

Imported woody material with roots and imported substrates would be rinsed of soils on Smith Ridge to prevent introducing fine sediments and noxious weeds to the river channel.

Ground-based systems employed to deliver spawning substrates to the river channel would operate from existing road surfaces or substrates would be delivered aerially by helicopter. 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 1 to August 15).

Areas of disturbance and exposed soil will be seeded with non-invasive cereal grains such as winter wheat and native perennial species.

Spill plans would be in place prior to any equipment work near aquatic habitat.

### **Wildlife:**

To reduce potential disturbance to any nesting spotted owls in the area, seasonal restrictions would be imposed on disturbance activities within 0.25 miles of spotted owl activity centers. Similar restrictions would apply for peregrine falcons, bald eagles, 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.

Sources of rock used as spawning substrate need to be free of noxious weeds.

Disturbed areas will be seeded with non-invasive cereal grains such as winter wheat and native perennial species.

**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.

**Heritage Resources:**

For both alternatives, cultural resource discoveries made during project operation will necessitate the halting of the project until the cultural resources in question can be evaluated by the Zone Archeologist. Significant cultural resources will be avoided and a 100 foot safety buffer imposed.

**Recreation and Human Safety:**

Tipping of trees within riparian reserves will be done in a manner that ensures public and operational safety, and would be coordinated with the IDT to protect resource values.

### **III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

Chapter III describes aspects of the environment that could be affected by the alternatives and the potential environmental consequences of implementing the alternatives. Additional details on the affected environment can be found in the Project File, Appendices, and the Upper McKenzie Watershed Analysis.

#### **Water Quality/Aquatic Resources - Affected Environment**

The analysis area is composed of the mainstem McKenzie River, adjacent floodplain and nearby uplands bounding the river between Trail Bridge Reservoir and Carmen Reservoir (Kink/Inland Basin Sub-watershed and Smith River Sub-watershed). Elevations range from 3,200 on Smith Ridge to the west to 2,100 feet along the channel of the McKenzie River near Trail Bridge Reservoir. Precipitation averages from 70 to 100 inches per year, much of it coming as snow in the upper elevations. None of the streams within the analysis area are listed as water quality limited by the State of Oregon on its 303(d) List of Water Quality Limited Streams.

Below Clear Lake, the McKenzie River flows southward through a steep canyon to Trail Bridge Reservoir. Along the way, it flows over several dramatic waterfalls including: Sahalie Falls, Koosah Falls, and Tamolitch Falls. About a mile below Clear Lake, the river enters Carmen Diversion Reservoir, which was built by EWEB in 1963 as part of a hydroelectric development on the McKenzie River. This is a hydroelectric development that diverts the majority of the river's flow at Carmen through a tunnel to Smith River Reservoir, and back to a penstock at the upper end of Trail Bridge Reservoir through another tunnel. As a result, the river flows intermittently from below Carmen Reservoir to the vicinity of Tamolitch Falls. Below Tamolitch Falls, the river resumes perennial flow to Trail Bridge Reservoir.

Stream flows in the McKenzie River below the outlet of Clear Lake have been measured since 1913. The highest flow occurred on December 23, 1964, when flows reached 3,100 cubic feet per second (cfs). The lowest flow occurred on October 27, 1992 when flows dropped to 116 cfs. Average daily flow at this site is 458 cfs. Additional monitoring of stream temperature and dissolved oxygen at the gauging site by the McKenzie Watershed Council in 1997 and 1998 did not reveal any temperatures in excess of state water quality standards for these parameters.

Also built in 1963 by EWEB as part of the Smith Carmen hydroelectric development, Trail Bridge Reservoir is a 73 acre, 65-foot deep man-made water body that lies at an elevation of 2,100 feet. The reservoir is fed by the waters of Smith River and the McKenzie River, part of which arrives via the tunnel from Smith Reservoir at the penstock and power plant near the upper end of the reservoir. As at Clear Lake and Smith Reservoir, water quality and clarity are high, with Secchi depths approaching 49 feet, and low biologic activity. Phosphorus levels remain anomalously high, likely due to the abundant young volcanic rock in the drainage.

Human use of Trail Bridge Reservoir includes fishing, boating and camping. The Willamette National Forest operates a 33 unit campground along the north shore of the reservoir.

The stand of trees adjacent to the Upper McKenzie River restoration reach is described as predominately Douglas fir with a hemlock and cedar understory. The stand is a multi-layered canopy with Douglas fir old growth representing the survivors of a near stand replacement fire that occurred about 140 years ago. The majority of the stand is composed of a Douglas fir, averaging 140 years old and measuring 135 feet tall, with a hemlock and cedar understory. The stand is considered fully stocked due to the following

indicators: 1) Suppression of saplings is occurring with 1-3 inch diameter trees averaging 21 years old; 2) A suppressed rate of growth on all but dominant trees; 3) A canopy more than 75% closed; 4) A stand replacement fire approximately 140 years ago and uniform regeneration; 5) A stand density index of 485 reflects a dominant suppressing overstory is inducing mortality in the understory.

Distribution of fish in this portion of the basin has changed dramatically over the past 40 years. The range of spring chinook (*Oncorhynchus tshawytscha*) has been altered with completion of the Carmen-Smith Project in the early 1960s. Approximately 4 miles of historic spring chinook spawning and rearing habitat is no longer accessible in lower Smith River and the McKenzie River above Trail Bridge Dam, to about the confluence of Kink Creek. A run of about 200 spring chinook is estimated to have utilized this habitat. The Carmen Spawning Channel below Trail Bridge Dam provided mitigation for loss of habitat. 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 around Trail Bridge Dam for the past seven years, in part to restore a natural prey base for bull trout, and in part to restore in-stream nutrients (Table III-1).

<b>Table III-1. Sub-Watershed Summary of Adult Chinook Transfers Above Trail Bridge Dam by ODFW</b>		
Year	Females	Males
1997	15	48
1998	20	30
1999	20	20
2000	19	23
2001	30	30
2002	43	56
2003	70	67

The historic range of bull trout (*Salvelinus confluentus*) is expected to have overlapped spring chinook distribution in the upper McKenzie River and Smith Rivers. Following completion of Smith Dam, angler reports of bull trout continued for over a decade, suggesting river-dwelling bull trout were isolated in Smith Reservoir. A population of bull trout has persisted above Trail Bridge Dam, also isolated. Both isolated groups likely originated from the main stem McKenzie River population, a river dwelling bull trout. Only the Trail Bridge Reservoir population of bull trout that are isolated above Trail Bridge Dam are provided habitat necessary for all life stages, however habitat is in very limited quantities. In addition to some recent restoration of bull trout prey above Trail Bridge with the ODFW transport of spring chinook, bull trout likely prey on native fish and stocked rainbow trout, planted in spring through summer. Currently 14,000 rainbow trout are stocked annually in Trail Bridge Reservoir.

Other fish that were historically present above Trail Bridge Dam likely include mountain whitefish (*Prosopium williamsoni*). Mountain whitefish are common in main stem McKenzie River, however the Trail Bridge barrier apparently prohibits their success above due to limited isolated habitat meeting their life history needs.

Native rainbow trout (*Oncorhynchus mykiss*), similar to distribution of whitefish, are river dwelling in the main stem McKenzie River and larger tributaries. The extent of their range following completion of the Carmen-Smith Project is known to include the McKenzie River above Trail Bridge Dam (including lower Smith River). Currently, ODFW stocks a fall spawning strain of rainbow in Clear Lake (33,000), Carmen (23,000), Smith (15,000) and Trail Bridge (14,000) Reservoirs from spring to late summer. Native rainbow trout are spring spawning.

Historically, brook trout (*Salvelinus fontinalis*) have been stocked in upper basin lakes, streams and reservoirs. Where brook trout became self-sustaining populations, or where conflicts with native fishes were found, stocking was ceased. Even though there are no locations in the project area that are stocked with brook trout any longer, they are now found naturalized in Clear Lake, Upper McKenzie River/Carmen Reservoir, and Trail Bridge Reservoir. A significant threat is posed by brook trout that overlap the distribution of the Trail Bridge bull trout. The risk of brook trout hybridization with native bull trout contributes to a high risk of Trail Bridge bull trout extinction.

Native cutthroat trout (*Oncorhynchus clarki clarki*) are the most widely distributed fish in the project area, ranging from almost all perennial streams to Clear Lake to Trail Bridge Reservoir. As has been observed in nearby lakes and streams, brook trout may displace native cutthroat trout, particularly in disturbed aquatic habitats.

In upper McKenzie River, a high proportion of flow provided by cold, subsurface sources, high water quality and high elevation combine to provide habitat for specialized aquatic macroinvertebrates. This project occurs in the contact between the Western Cascades geology and High Cascades geology. The Western Cascades are more steeply incised and bound the river to the west, and younger High Cascades are lower gradient lava flows that originated from the recent volcanism to the east. The upper McKenzie River flows between both geologies. The processes of debris transport (debris torrents) are more common in the Western Cascade drainages. This process is important to providing woody material to stream channels and continued large woody material recruitment into lower elevation river channels. However, significant Western Cascade drainages above the project area are intercepted by highways and Carmen Reservoir, and the potential for recruiting large woody material via migration is reduced in this landscape. Streamside recruitment is generally a more common process of wood supply to High Cascade channels. Once wood has fallen into a channel, stream energy is usually insufficient to transport large-sized organic debris, due to stable spring-fed flows.

In the McKenzie River above Trail Bridge Dam, low gradient areas are important reproductive and rearing areas for spring chinook salmon and bull trout. Low gradient reaches between the confluence of Kink Creek and Trail Bridge Reservoir have been identified for their importance to spawning spring chinook and bull trout. Current in-stream wood density of 7 pieces of large wood per mile (>24 inch diameter by 50 foot length) is below desired densities of approximately 80 pieces of material per mile. A low density of existing large in-stream woody material and altered flow regime downstream of Carmen Diversion, are believed to combine and contribute to reduced deposition of spawning substrates and reduced spawning potential. Diversion of McKenzie River flow at Carmen is expected to reduce volume of spawning-sized substrates available for deposition in the spawning reach, and may be aggravated by the low volume of large wood in providing velocity breaks and opportunity for deposition. Examination of the seasonal channel downstream of Carmen Diversion with aerial photographs from 1981 and 1997 reveal a channel that appears to be stabilizing with hardwood vegetation. It is assumed that sediment delivery to the reproduction reach is reduced due to reduced flow period and volume, and to a channel stabilizing with vegetation since completion of the hydroelectric project. With a reduced sediment supply, the upper McKenzie River channel upstream of Trail Bridge Reservoir has likely coarsened since completion of the Carmen-Smith hydroelectric project. However, no pre-hydroelectric project data exists to compare channel substrate composition to existing condition and this analysis is left with assumptions based on observations below impoundments elsewhere. Large woody material migration, similarly interrupted by stream crossings and dams, has likely resulted in a reduction of in-stream wood in project area.

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 their 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 Upper McKenzie project is located in the Upper McKenzie River Watershed, which is included in the waters designated as EFH for spring chinook salmon by the PFMC.

## **SIGNIFICANT ISSUES**

### **Water Quality/Aquatic Resources - Effects**

#### **1. Riparian and Aquatic Habitat Quality (Available stream shade, spawning habitat availability, stream temperature).**

##### **Alternatives A and B as they Respond to the Significant Issue of Water Quality/Aquatic Resources:**

The action alternatives include eight specific Best Management Practices (BMP's) that provide for the protection of soil, water and fisheries as required project mitigation. The project also provides for the retention of effective stream shading vegetation and adequate levels of large wood in project adjacent riparian reserves. Some increase in riparian downed 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 will avoid potential disturbance of riparian and aquatic resources.

The seventeen trees identified for providing key features in this reach are dispersed along both banks of the McKenzie River in the project area. Placing 17 trees in a dispersed fashion in the spawning reach will maintain the remaining stand (approximately 66 trees/acre over 17 inches in diameter) and would utilize 1% of the existing stand within 100 feet of the river channel. Utilization of stream adjacent trees will result in a reduction of 3.7% 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 3.7% 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 0.005° Fahrenheit, essentially an immeasurable difference between pre-project and post-treatment condition. Utilization of live trees would not significantly change the vegetative composition, age structure, quantity, or vigor of riparian stands.

The placement of wood is designed to encourage a mostly straight, single channel to provide varying velocity breaks and allow deposition of finer spawning substrates. This would be achieved mainly through increased channel roughness. By importing approximately 50 pieces of LWM, the proposed final density of large woody material would be about 80 pieces in the 1.0 mile reach. The resulting reduction in water velocities would allow deposition of gravels and cobbles immediately above and below structures, and deposition of finer sediments and vegetative litter and detritus within backwaters and off-channel areas. Plunge pools and scour pools are expected to form within the active channel downstream of, and adjacent to wood structures. The additional roughness supplied in this project would encourage the channel to meander, however channel migration would be limited due to channel type. The Upper McKenzie River channel is described as a Rosgen type B3 channel, with channel materials dominated by cobbles, and slope range from 2-3%. Type B3 channels are typically constrained by valley walls and characterized by narrow flood plains. In the case of the Upper McKenzie River, restoration wood is expected to stabilize periodic areas of flow refuge of value to spawning bull trout and spring chinook, as well as rearing juveniles. 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 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 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 pre-management condition would not affect the free-flowing character of the river, as natural conditions of flow would be maintained. Water quality and visual quality would be maintained with restoration of channel complexity.

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

Alternative B includes the same protective measures as Alternative A for protection of soil, water and fisheries resources. As Alternative B includes potential supplementation of spawning substrates, additional protections for aquatic habitat quality would be implemented. Cleaning of spawning substrates to remove fine sediments and noxious weed contamination prior to importation into the restoration reach, would be required, should importation of substrate be found necessary. Project monitoring will determine whether adequate volumes of spawning substrate are recruited in the restoration reach, and whether importation of spawning gravel is necessary.

The restoration project is designed to improve aquatic conditions providing habitat for listed species. It is expected spawning and rearing habitat conditions will improve for bull trout and spring chinook following implementation.

Implementation of Alternative A or B May Affect, but is Not Likely to Adversely Affect (NLAA) aquatic habitat, recreational fisheries, 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.

**Alternative C**

The No Action Alternative proposes no activities that would create risks to soil and water resources. However, the alternative allows existing problems such as low in-stream wood density and simplified at-risk species habitat to continue untreated and dependant upon natural rates of input to replenish existing condition. Riparian and aquatic 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 largely on the natural rate of stream adjacent blowdown and deadfall. Recruitment of wood and substrate from upstream of the project area would be expected to remain low with the diversion of most flow at Carmen Reservoir. Alternative C would not meet the purpose and need for action to restore aquatic habitat conditions. It would not take action to provide restored habitat for ESA listed bull trout and spring chinook salmon, as directed by the Willamette Forest Plan and recommendations from the Upper McKenzie River Watershed Analysis.

**1a. ESA Listed Species (bull trout and spring chinook salmon)**

**Alternative A and B**

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 May Affect, Likely to Adversely Affect (LAA). While the likelihood of a cable-placed or helicopter-placed tree harming a juvenile is slim, a slim level of risk still warrants an LAA assessment. Similarly, placement of spawning substrate is characterized as May Affect, Likely to Adversely Affect, as there is risk of harming juvenile bull trout or spring chinook salmon. Consultation with the Northern Oregon Level 1 Team found concurrence with assessment findings (October 16, 2001). The project is currently covered by USFWS programmatic Biological Opinion (April 11, 2003).

### **Alternative C**

Alternative C would not meet the purpose and need for action to restore aquatic habitat conditions for listed species. Risks to the isolated Trail Bridge bull trout population identified in Buchanan, et al. (1997) (including habitat condition) would not be addressed. Factors suppressing the Trail Bridge bull trout population (including habitat degradation) would continue to contribute to a high risk of extinction. The No Action alternative would not provide restored habitat for ESA listed bull trout and spring chinook salmon, as directed by the Willamette Forest Plan and recommended by the Upper McKenzie River Watershed Analysis.

## **1b. Sedimentation**

### **Alternatives A and B**

Potential to introduce fine sediment with stream adjacent activity is mitigated with distance of placement equipment from the channel. Cable-lining live trees into the channel would be accomplished using a cable drum located above the river on the Rd 735. Rd 735 is located on a terrace generally further than 300 feet to the McKenzie River channel. The cable-lining equipment is mounted on rubber tires and the vehicle would remain on the road surface. Potential to introduce sediment from this road surface is minimal due to the road's flat character and distance from the channel. Potential to introduce fine sediments through utilization of stream adjacent riparian trees will be mitigated with scattering duff and litter over exposed soils and seeding with native grasses. The small area of disturbance would consist of 17 uprooted trees dispersed over the 1 mile long reach, resulting in a negligible increase in fine sediment available to migrate to the river channel. Helicopter placement of imported material would not introduce fine sediments of measurable quantity to the river channel. All imported material would be rinsed from root soils prior to placement. Similarly, if substrates are imported to the spawning reach, clean material will be used. Road reconstruction (1/4 mile of Rd 683) for access to the helicopter service landing and ground-based equipment utilized in this project would not contribute to degradation of aquatic habitat due to distance from the channel, low intensity of reconstruction activity (brushing and blading the existing road surface) and short-duration of project activities. Habitat quality essential to native and listed species would be maintained with project activities and mitigations.

### **Alternative C**

There is no potential to increase fine sediment supply to the McKenzie River channel with the No Action Alternative due to the absence of project activities on road and stream adjacent areas.

## **2. Threatened, Endangered, and Sensitive Wildlife and Botanical Species**

### **Affected Environment**

**Alternatives A and B as they Respond to the Significant Issue of 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 C. 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 Trail Bridge and Smith Reservoirs. Surveys have not documented nesting in the project area. Harlequin ducks are known to successfully nest in the McKenzie River reach above Trail Bridge Reservoir.

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 significantly 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. It 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 – July 15) 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 to July 15.

**Alternative C as it Responds to the Significant Issue of Threatened, Endangered, and Sensitive Wildlife and Botanical Species:**

There would be no negative effects to TES wildlife with this alternative. No trees would be pulled over or imported to the site. No noise disturbance from helicopters or heavy equipment would occur. Benefits to bald eagles and harlequin ducks from aquatic and riparian habitat restoration would not occur. Accumulation of large woody material and gravel would occur naturally over time at unpredictable rates.

## **OTHER ISSUES**

### **Effects on Other Issues:**

### **3. Hydroelectric Operations**

About a mile below Clear Lake, the river enters Carmen Diversion Reservoir, which was built by EWEB in 1963 as part of a hydroelectric development on the McKenzie River. This is a hydroelectric development that diverts the majority of the river's flow at Carmen through a tunnel to Smith River Reservoir, and back to a penstock at the upper end of Trail Bridge Reservoir through another tunnel. As a result, the river flows intermittently from below Carmen Reservoir to the vicinity of Tamolitch Falls. Below Tamolitch Falls, the river resumes perennial flow to Trail Bridge Reservoir, also built by EWEB. There are no expected impacts to hydroelectric operations at EWEB's Carmen-Smith Project, located downstream of the proposed project area, from implementation of the action alternatives because the Forest Service will be responsible for removal of restoration material that migrates to Trail Bridge Reservoir.

### **4. Recreation**

The McKenzie River and its adjacent lands are a popular location for fishing, hunting, hiking, biking, photography, picnicking, and boating. The McKenzie River National Recreation Trail passes through the project area. The trail is heavily used by hikers and mountain bikers. It is designated a Class I trail in the Willamette Forest Plan. Trail Bridge and Carmen Reservoirs are also popular for fishing and boating

with small boats. Campgrounds along State Highway 126 and adjacent to the project area include Trail Bridge, Ice Cap, Cold Water Cove, and Clear Lake. A private lodge is located at the north end of Clear Lake.

There are no expected impacts to the recreating public as only short-term interruption of river and trail use will occur during implementation of either action alternative. Discerning those trees placed into the channel would be difficult for the casual observer, as they would appear as fallen trees into the channel, with rootmass intact and natural in appearance. Placement of the material would result in closure of the McKenzie River Trail adjacent to the project area for a period of 4-5 days. Project work would be scheduled during the work week to avoid week-end closure of recreational access. No long-term impacts to the quality recreational experience of the project area will occur. A short-term closure of the scenic trail within the project area will be necessary during project implementation to maintain public safety.

## **5. Visual Quality**

The forested slopes along the McKenzie River form an important scenic backdrop to the Santiam Pass-McKenzie Pass National Scenic Byway that includes the portion of State Highways 126 adjacent to the project area. The project area also includes a portion of the Oregon State Scenic Waterways. The Oregon Rivers Initiative, a statewide ballot measure, was passed in 1988 and added the upper McKenzie River to the State Scenic Waterway program. The Upper McKenzie Wild and Scenic River Management Plan (1992), a joint federal and state plan, provides for protection and enhancement of resource values in the river corridor, and allows public use and enjoyment of those resources. Management goals include striving 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.

There are no expected impacts to the visual quality in management areas of Scenic Retention Foreground (MA-11f), McKenzie River Wild and Scenic River (MA-6c), or the Oregon State Scenic Waterway areas from implementation of the action alternatives because the pulling over 17 trees from the riparian area is not expected to change the texture or character of the visible forested landscape. Trees are selected in a dispersed manner and are not visible from the Highway corridor. In-stream wood of restoration origin will be visible from the hiking trail would remain natural in appearance as woody material accumulations will be assembled randomly to mimic natural in-stream accumulations. Consistency with the Visual Quality Objectives of Scenic Retention Foreground would be maintained.

## **6. Noxious Weeds**

The majority of weed populations found in the planning area are located along roadsides, landings, in early-seral regeneration units, and in meadow communities. Noxious weeds in the planning area include bull thistle (*Cirsium vulgare*), Canada thistle (*Cirsium arvense*), St. John's wort (*Hypericum perforatum*), 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.

The spotted knapweed (*Centaurea maculosa*) 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 State Highways 126 and U.S. Highway 20.

There are no expected impacts to noxious weeds from implementation of the action alternatives because prevention measures would be used to minimize expansion of existing populations. Control under the

Willamette National Forest Integrated Weed Management Environmental Assessment (WNF 1999) provides for on-going treatment of the existing populations. Control methods used in the watershed include manual removal, release of beneficial insects that feed on the seed heads of specific noxious weed species, and the selected use of herbicides. Also, a provision requiring that all equipment used in restoration activity and road maintenance equipment 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. For activities where rock aggregate and fill is brought in to reconstruct roads, the contract will include the requirement that the material be from a source free of noxious weeds to limit the distribution of non-native seed propagules.

Known occurrences of new invader species located along State Highway 126 and forest roads 2600-730 and 2672-655 would continue to be treated via hand pulling and herbicide application.

## **7. Soil Erosion**

The soils of the project area are in good condition and past management activities have not disrupted their long-term productivity. Past management activity in the Riparian Reserve adjacent to the restoration reach has consisted of mostly road construction (Rd 655 to the west and Hwy 126 and Roads 735/739 to the east of the McKenzie River channel) in the 1960's. Previous harvest activity consisted of small scale salvage operations, removing individual downed trees from what is now the Riparian Reserve, or from the McKenzie River channel. Previous harvest activities were performed primarily by cable yarding systems and did not result in significant erosion, loss of effective ground cover, or slope instability due to the 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).

There are no expected impacts to soils in the area from implementation of the action alternatives because ground-disturbing equipment would remain on roads and be prohibited in riparian reserves. Also, exposed soil would only occur in the root system area of pulled over trees, resulting in a small area of extent in the project. Disturbed areas will be seeded with native plant seed following completion of the project.

## **8. Management Indicator Species, Neotropical Migratory Land Birds, Survey and Manage Species, Protection Buffer Species, and Other Mitigation Species**

Management Indicator Species (MIS) were addressed in the WNF LRMP (1990). They include the spotted owl, pileated woodpecker, marten, elk, deer, cavity excavators, bald eagles, peregrine falcons, and fish. Through Region-wide coordination, each Forest identified the minimum habitat distribution and habitat characteristics needed to satisfy the life history needs of the MIS. Management recommendations to ensure their viability were incorporated into all WNF Plan Action Alternatives. Proposed actions and mitigations would meet all applicable Standards and Guidelines from the WNF Plan. With the 1994 and 2001 Amendments to the WNF Plan (i.e. the Northwest Forest Plan, NWFP), persistence of populations would be maintained under the NWFP Standards and Guidelines (Appendix J2).

Neotropical Migratory Birds and their required protection are outlined in the January 11, 2001 Executive Order "Responsibilities of Federal Agencies to Protect Migratory Birds." Habitats vary broadly for this large group of species. Survey and Manage, Protection Buffer, and Other Mitigation Species from the 2001 ROD for the NWFP were surveyed for as needed. This is described in more detail in Appendix D.

There are no expected impacts to these species from implementation of the action alternatives because the amount or characteristics of required habitat for these species would not be significantly changed. The

pulling over of 17 trees with this project may unintentionally take individual migratory birds, but is not expected to have a measurable negative effect on bird populations because of the limited extent of the habitat removal. The action would occur outside the nesting season of most neotropical migratory birds (after July 15 through August 15) to further mitigate losses. Survey and Manage Species were surveyed for as necessary and none were found in the project area. Appendix D describes this in more detail. Survey and Manage species were located and protected from disturbance.

Anadromous and resident fish considered Management Indicator Species are those species commonly angled for. In the upper McKenzie River and tributaries in the project area, the species commonly fished are spring chinook salmon, rainbow trout, and cutthroat trout. Current conditions and effects of the proposed action common to MIS and their habitat are described in Chapter III under Water Quality/Aquatic Resources.

## **9. Cultural Resources**

There are numerous heritage resources within the project area. They include ancient prehistoric lithic sites (of varying sizes), historic period Indian peeled tree locations (culturally-modified trees), historic roads and trails, and historic recreation sites.

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 Upper 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.

Though surveys within this landscape have documented cultural resource sites, there are no expected impacts from implementation of the action alternatives because sites found near the proposed activity would be avoided. The District Archeologist would evaluate any inadvertent discoveries.

**Table III-2. How Alternatives Respond to Key Issues**

<b>Alternative A</b>		
<i>Key Issue</i>	<i>Measurement Criteria</i>	<i>Project Proposal</i>
Water Quality/Aquatic Resources	Riparian habitat altered (acres)	Less than 1 acre
	LWD volume (LWD/mile)	Increase to 80 LWD/mile
	Spawning habitat (cubic yards)	Natural recruitment of spawning substrate
	Stream shade/temperature (°F)	Increase less than 0.1° F
Threatened, Endangered, Sensitive Species Habitat	TES habitat altered (acres)	Less than 1 acre
	Timing of noise disturbance (month)	Implementation occurs beyond timing restrictions (July 16 – August 15)
<b>Alternative B</b>		
<i>Key Issue</i>	<i>Measurement Criteria</i>	<i>Project Proposal</i>
Water Quality/Aquatic Resources	Riparian habitat altered (acres)	Less than 1 acre
	LWD volume (LWD/mile)	Increase to 80 LWD/mile
	Spawning habitat (cubic yards)	Increase to 12 cubic yards/LWD accumulation (natural + supplemented)
	Stream shade/temperature (°F)	Increase less than 0.1° F
Threatened, Endangered, Sensitive Species Habitat	TES habitat altered (acres)	Less than 1 acre
	Timing of noise disturbance (month)	Implementation occurs beyond timing restrictions (July 16 – August 15)
<b>Alternative C</b>		
<i>Key Issue</i>	<i>Measurement Criteria</i>	<i>Project Proposal</i>
Water Quality/Aquatic Resources	Riparian habitat altered (acres)	No change in riparian habitat
	LWD volume (LWD/mile)	Natural recruitment to supplement existing 7 LWD/mile
	Spawning habitat (cubic yards)	Natural recruitment of substrate if LWD increases
	Stream shade/temperature (°F)	No change in stream temperature
Threatened, Endangered, Sensitive Species Habitat	TES habitat altered (acres)	No change in TES habitat
	Timing of noise disturbance (month)	No project associated disturbance

## **INDIRECT, CUMULATIVE, AND UNAVOIDABLE EFFECTS**

The analysis of cumulative effects considered past, present and reasonably foreseeable future actions on these lands. The Carmen-Smith hydroelectric project is currently in process of re-licensing with the Federal Energy Regulatory Commission and other federal, state and regulatory agencies. Future restoration projects in the vicinity of this project are probable. One such project under consideration is fish passage at Trail Bridge Dam. This action would reconnect lower McKenzie River with upper reaches. The effects and costs of such projects will be evaluated by Eugene Water & Electric Board and participating agencies. Completion of the re-licensing of the hydroelectric project is scheduled to be complete in 2008. Projects under consideration and associated with re-licensing are not yet clearly defined.

The Two Bee Landscape Project is a timber management/roads treatment project proposed to the north and west of this restoration project. The thinning project would not increase sources of sedimentation in the restoration reach, as proposed thinning stands and roads are located at distances from adjacent channels sufficient to reduce potential sedimentation and at distances from the restoration reach to reduce potential sources to an immeasurable amount. Similar negligible quantities of sedimentation are expected from the Robinson-Scott Landscape Management Project located in the vicinity of the project area. Riparian setbacks protecting waterways, mitigations and Best Management Practices are currently being utilized with thinning harvest of units to the east of the project area. Past projects in the vicinity of the proposed project include small roadside salvage projects. Most are older than 20 years in age and the effects do not contribute to degradation of aquatic habitat quality. Road systems and maintenance in the project area contribute levels of sedimentation that do not accumulate to degrade water quality and aquatic habitat in the project reach. Road densities of less than 2.0 miles/square mile upstream of the project area are located on the Ikenick plateau, Bunchgrass Ridge or McKenzie River terraces. Due to the highly porous nature of the drainage and a network that flows over glacial deposits and volcanic flows, transmission of fine sediments is often intercepted or carried efficiently through the system during high flows.

Cumulatively, these projects, including the current proposal, would not contribute to degradation of aquatic habitat quality. Stream shade would not be significantly influenced by proposed actions, and stream adjacent activities have been avoided in efforts to maintain water quality. Maintenance of stream adjacent Riparian Reserves is also an emphasis in future projects, as directed by the Willamette National Forest Plan as amended by the Northwest Forest Plan.

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.

## **REQUIRED DISCLOSURES**

There are no proposed activities on prime farmlands or rangelands within the planning area, and therefore, there would be no adverse affects to these resources. Floodplains do occur in the planning area, and impacts are described above.

American Indian rights, including those covered by the American Indian Religious Freedom Act, would not be affected by the implementation of this project.

Proposed actions would be conducted in a manner that does not exclude persons (including populations) from participation in, deny persons (including populations) the benefits of, or subject persons (including populations) to discrimination because of their race, color, or national origin, as directed by Executive Order #12898.

The proposed action is not likely to adversely affect aquatic systems, recreational fisheries, 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.

The U. S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, religion, sex, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited basis apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's Target Center at 202-720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14<sup>th</sup> and Independence Avenue SW, Washington, DC 20250-9410, or call 202-720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

## **CIVIL RIGHTS/ENVIRONMENTAL JUSTICE**

Civil Rights legislation and Executive Order #12898 (Environmental Justice) directs an analysis of the proposed alternatives as they relate to specific subsets of the American population, which include ethnic minorities, people with disabilities, and low-income groups. The Upper McKenzie River Aquatic Restoration Project is not located in a minority community and would not affect residents of low or moderate income. Proposed actions would be conducted in a manner that does not exclude persons (including populations) from participation in, deny persons (including populations) the benefits of, or subject persons (including populations) to discrimination because of their race, color, or national origin.



## IV. CONSULTATION WITH OTHERS

The Upper McKenzie River Aquatic Restoration Project was originally analyzed as part of the Two Bee Landscape Management Project, initiated in 1999, and was first listed in the Summer 1999 issue of the Forest Focus—the quarterly schedule of proposed actions (SOPA) for the Willamette National Forest. The project has since been separated from the Two Bee project and appeared separately in the Forest Focus through the current issue.

On July 12, 1999, a Scoping Letter was mailed out to a list of 62 addresses that included individuals, organizations, Tribes, and governmental organizations who have expressed an interest in similar projects on the McKenzie River District. The letter was mailed to the Confederated Tribes of the Siletz Indians, Confederated Tribes of the Grand Ronde Community of Oregon, Confederated Tribes of the Warm Springs, and The Klamath Tribes.

Comments were received in response to scoping from Oregon Natural Resources Council, American Lands Alliance, Forest Conservation Council/Forest Guardians, one anonymous individual, and the McKenzie Watershed Council.

Only the McKenzie Watershed Council's input was directly related to the proposal for stream restoration and the recovery of spring chinook salmon in the upper reaches of the McKenzie River. Comments supporting restoration of habitat for bull trout and spring chinook were received from the McKenzie Watershed Council. The IDT considered all scoping comments during issue development and analysis of alternatives for this project.

Project design and development incorporated recommendations and assistance from several partners. Currently the project has received support from the McKenzie Watershed Council, Oregon Department of Fish and Wildlife, U.S. Fish and Wildlife Service, and Oregon State University.

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## **VI. APPENDICES**

Appendix A – Aquatic Conservation Strategy Objectives

Appendix B – Biological Assessment, Spring Chinook Salmon and Bull Trout

Appendix C – Biological Evaluation, Botany

Appendix D – Biological Evaluation, Wildlife

Appendix E – Section 7 Wild and Scenic Rivers Act Determination

## APPENDIX A

# **An Evaluation of Activities Proposed by the Upper McKenzie River Aquatic Restoration Project Environmental Assessment for Consistency with the Aquatic Conservation Strategy**

### **Introduction**

The Upper McKenzie Aquatic Restoration Project Environmental Assessment analyzes restoration activities that have been designed to meet the following objectives.

To provide immediate and contribute to long-term spawning and rearing habitat for at-risk species (bull trout and spring chinook salmon) above Trail Bridge Reservoir;

To provide immediate and contribute to long-term, sustainable habitat for native aquatic species;

The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. A goal of this strategy is to maintain a "natural" disturbance regime. In addition, management activities must comply with nine objectives that are included in the strategy. A variety of tactics to accomplish these goals and objectives are incorporated into four primary components. These components are:

- Riparian Reserves
- Key Watersheds
- Watershed Analysis
- Watershed Restoration

These four components, along with Late Successional Reserves, are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems (Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl - USFS, BLM 1994, (ROD), pages B9-B12).

## **The Four Components**

### 1. Riparian Reserves

The Northwest Forest Plan defined Riparian Reserves as “portions of watersheds where riparian-dependant resources receive primary emphasis and where special standards and guidelines apply” (ROD page B12). Riparian Reserves include those portions of a watershed directly coupled to streams and rivers, that is, the portions of a watershed required for maintaining hydrologic, geomorphic, and ecologic processes that directly affect standing and flowing water bodies such as lakes and ponds, wetlands, streams, stream processes, and fish habitats (ROD pgs. B-12 and B-13).

The Upper McKenzie Watershed Analysis (Willamette N.F. - 1995) (UMWA) made recommendations for riparian reserve widths for the streams in the watershed, retaining the initial reserve widths from the ROD for all fish bearing and perennial streams, and allowing for reduction in reserve widths along intermittent streams. The analysis also established the site potential tree heights to be used in identifying reserve widths based on timber type (UMWA Chapter 5, page 22).

### 2. Key Watersheds

The Northwest Forest Plan created an overlay of Key Watersheds that are intended to provide refugia for at-risk stocks of anadromous salmonids and resident fish species. Refugia are a cornerstone of the conservation strategy for these species, consisting of watersheds that provide high quality habitat or are expected to provide habitat. Two different levels of protection, or tiers, are identified, as well as non-Key watersheds (ROD page B19). In key watersheds, completion of a watershed analysis is required prior to most management activities. The project area is located in Tier 1 Key Watershed and with that designation receives the highest level of protection and highest priority for restoration based on providing refugia for spring chinook salmon and bull trout. The entire project area is contained within the area analyzed by the Upper McKenzie Watershed Analysis.

### 3. & 4. Watershed Analysis and Watershed Restoration

The Upper McKenzie Watershed Analysis (UMWA) was prepared by the McKenzie Ranger District in 1995. The watershed was characterized in terms of past and current conditions, stratified into landform blocks, and recommendations were made to guide development of management proposals to maintain and restore watershed conditions

## **Aquatic Conservation Strategy Objectives**

The previous discussions highlighted the consistency of the Upper McKenzie Aquatic Restoration Project with the four components of the Aquatic Conservation Strategy. This section will outline how the activities proposed in the action alternatives conform to the

nine objectives of the ACS. The information presented is summarized from Chapter 2 and Chapter 4 of the Environmental Assessment, where greater detail can be found, if needed.

### **Objective #1**

**Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.**

Project design was developed so that treatment would, to the extent possible, resemble the effects of the wood and sediment delivery that historically occurred in the project area. The objectives of the proposed treatments are to develop in-stream habitat complexity that will contribute to the continued existence of at-risk species (bull trout, spring chinook) and other native aquatic species (such as rainbow and cutthroat trout, and aquatic macroinvertebrates), while creating conditions resembling those that would occur in the presence of historic wood and sediment delivery. Historic conditions are assumed to be more complex than habitat that is currently available based on the alteration of flow at Carmen Dam, upstream of the project area.

### **Objective #2**

**Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, upslope areas, headwater tributaries, and intact refugia. These network connections must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.**

No alteration of the spatial and temporal connectivity is proposed with this project. Placement of wood and spawning substrates in the restoration reach would not alter network connections. The free-flowing character of the reach would remain unaffected.

### **Objective #3**

**Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.**

Project design utilizes methods of wood placement to maintain riparian integrity while delivering large wood to the treatment reach. Utilization of stream adjacent trees to serve as key features will affect 1% of the stand adjacent to the channel (of trees within 100 feet of the channel). Riparian stands and future sources of in-stream wood recruitment will not be significantly affected by project activity. Project design would place large wood in accumulations to mimic natural accumulations that currently occur in the reach. Off-bank and channel spanning large woody material accumulations mimicking natural examples would be expected to favorably influence spawning substrate deposition and contribute to habitat elements benefiting listed species. Importation of the majority of restoration material from upland sources is expected to conserve stream adjacent wood

supply. Potential importation of spawning substrate, should sufficient material not be recruited, would be distributed in the vicinity of restored wood accumulations, and would not be placed in volumes to adversely affect bottom configuration.

#### **Objective #4 and Objective #5**

**Maintain and restore water quality necessary to support healthy riparian, aquatic and wetland ecosystems. Water quality must remain within the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities. And**

**Maintain and restore the sediment regime under which aquatic ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.**

The potential to introduce fine sediment in the restoration reach is minimized by prohibiting equipment in and near the channel, and requiring restoration activity to be accomplished from existing road beds and by aerial placement of restoration material. The small area of disturbance created by utilizing 17 stream adjacent trees would not be expected to provide measurable quantities of fine sediment to the channel. Project design incorporates methods to maintain and improve channel characteristics favoring reproduction, growth and survival of at-risk species, including other native salmonids and aquatic insects.

The project will monitor spawning substrate recruitment following seasonal high flow in order to evaluate project effectiveness and determine if importation of substrate material is necessary. Existing natural accumulations of woody material have captured sufficient quantities of spawning-sized substrate to provide for spring chinook and bull trout spawning habitat in a 4-year time span. If supplementing spawning substrates is necessary, the activity would be expected to compensate for the altered flow regime and sediment delivery downstream of Carmen Dam.

#### **Objective #6 and Objective #7**

**Maintain and restore in-stream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration and spatial distribution of peak, high, and low flows must be protected. And**

**Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.**

The restoration project would not be expected to effect the timing, magnitude, duration or spatial distribution of flows due to the small area of canopy influence.

Some benefit to a shallow floodplain is expected with restoration of large wood to the Upper McKenzie River channel. Flow deflection and areas of refuge created by large

wood accumulations would be expected in the restoration reach. However, this channel is characterized as a Rosgen B3 type channel, with constraining valley walls. Opportunity for the channel to migrate and inundate the floodplain are limited due to channel type and the addition of large wood will not be expected to adversely affect the timing, variability, and duration of inundation events.

#### **Objective #8**

**Maintain and restore the species compositions and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distribution of coarse woody debris sufficient to sustain physical complexity and stability.**

The Upper McKenzie Aquatic Restoration Project is designed to restore a volume of large wood believed to more closely approximate naturally occurring volumes. This treatment is expected to provide immediate channel response and recruitment of spawning-sized substrates. Future supplies of streamside recruited large wood and continuing recruitment of spawning substrates is expected to occur in the future. Channel response to an increase in channel roughness provided by in-stream wood will similarly be expected to more closely reflect natural rates of bank erosion, channel migration and capture of nutrients.

#### **Objective #9**

**Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.**

Implementation of the restoration project is intended to restore channel complexity and in-stream processes, essential to habitats providing for aquatic species. Providing cover and structures capable of nutrient capture is expected to provide favorable habitat for species such as aquatic insects and salmonids other than at-risk species. Some benefit to riparian-dependent species is also expected. Off-bank large wood placements are expected to contribute to habitat utilized by riparian vertebrates and invertebrates. Species such as harlequin ducks, mink and otter may be expected to use the variety of downed wood created terrestrial habitats.



*Upper McKenzie River Aquatic Restoration Project Aquatic Conservation Strategy Analysis*

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**Date: January 28, 2004**



**File Code:** 2670

**Date:** February 4, 2004

**Route To:** Appendix B; Upper McKenzie River Aquatic Restoration Project EA

**Subject:** Upper McKenzie River Aquatic Restoration Project Biological Assessment /  
Biological Evaluation

**To:** Dave Bickford – Team Leader

The purpose of this Biological Assessment / Biological Evaluation (BA/BE) is to document the potential effects to aquatic listed species (Endangered Species Act – ESA) and sensitive species (USFS Region 6 list). Two fish species that will be reviewed in the BA/BE are listed as “threatened” and they are: bull trout (*Salvelinus confluentus*), and spring chinook salmon (*Oncorhynchus tshawytscha*). There are currently no aquatic species on the sensitive list, vertebrate or invertebrate, that occur on the McKenzie River Ranger District. Therefore this BE/BA will only review potential effects to bull trout, spring chinook salmon and Management Indicator Species (typically angled for salmonids; rainbow trout (*Oncorhynchus mykiss*) and coastal cutthroat trout (*Oncorhynchus clarki clarki*)).

### **Project Area**

The proposed action is located entirely within Upper McKenzie River 5<sup>th</sup> field watershed (Upper McKenzie 10-09-00-04-07) and site specific location within the Tier 1 Key Watershed portions of the 5<sup>th</sup> field watershed. The Legal Description is T. 15 S., R. 6 E., Section 1. The proposed restoration project is located in the McKenzie River channel upstream of Trail Bridge Reservoir, extending from just above Trail Bridge for one mile to near the confluence of Kink Creek.

### **Description of Alternatives**

#### **Alternative A**

The Upper McKenzie River Aquatic Restoration Project proposes supplementation of existing woody material to act as flow deflection and capture spawning gravels. The large woody material would be placed in the McKenzie River channel upstream of Trail Bridge Dam (Figure 1). 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 purpose of importing woody material is to supplement an existing low density of large woody material in the main stem McKenzie River above Trail Bridge Reservoir. Currently, the density is 7 pieces of large wood per mile (>24 inch diameter by 50 foot length). The reach between Trail Bridge Reservoir to near Kink Creek confluence (approximately 1.0 mile long) is known spawning habitat for bull trout isolated above Trail Bridge Dam and spring chinook salmon transported above the dam by ODFW. The low volume of sources of flow deflection and low quantities of gravel accumulation limits opportunity for spawning bull trout and spring chinook salmon. Desired densities of LWD are approximately 80 pieces of woody material per mile.



Figure 1. Project Area.



Techniques to place the woody material would minimize impacts to other resources. Cables would be used to pull over live trees from the riparian reserve (“key features” providing stability for wood accumulations). Following placement of key features, material would be imported to form an accumulation using a helicopter. Helicopter placement provides full suspension to place imported material and avoids disturbance of the river bottom and adjacent riparian area. By importing approximately 50 pieces of LWM, the proposed final density of large woody material would be about 80 pieces in the 1.0 mile reach.

Seventeen trees would be selected 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 in most high flow events. The seventeen live trees, serving as key features, would be pulled over from the Riparian Reserve, located at distances of 20-70 feet from the active channel. The size of tree selected for key features ranges from 15.5 to 59 inches in diameter at breast height, averaging 32.8 inches in diameter. The seventeen trees selected for restoration of in-stream wood are dispersed through the 1.0 mile reach on each bank. Twelve trees are located along the right bank looking upstream (Highway 126 side), and five along the left bank. Once key features are in place in the channel, helicopter placement of imported material from Smith Ridge will occur. Project implementation would occur during two years for wood placement. Tree tipping would occur during summer 2004, and helicopter placement during summer 2005. Material will be added to each key piece of woody material, to mimic natural accumulations. Woody material jams will consist of 4-6 pieces in off-bank accumulations. Several opportunities exist for channel spanning accumulations.

A helicopter landing for refueling and service would be located on Road 683. Road maintenance on an existing road (Road 683 [0.25 mile]) would be required to access the helicopter service landing. Road maintenance consists of the following activities: brushing, blading, and spot rock placement. Restoration material will be staged near Carmen Air Quality Station, on Smith Ridge (along Rd 655), about 0.5 mile west of the restoration reach, and 0.3 mile south of the service landing. Restoration material will be flown directly from the staging site to the restoration reach. A Flight Safety Plan and Spill Plan will be required prior to flight operations. Timing requirements for implementation are estimated at three days for placement of stream adjacent trees (summer 2004) and 1-2 days for aerial placement of staged material (summer 2005). Equipment cleaning precautions will be utilized to avoid potential introduction of noxious plants from ground based equipment. Seasonal operation restrictions will be used to avoid disturbance of wildlife and fisheries resources.

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. As a portion of restoration material is expected to migrate in response to extreme high flow events and potentially interfere with EWEB hydroelectric projects, the Forest Service will be responsible for removal of material of restoration origin that migrates to Trail Bridge Reservoir. All material in the restoration reach of natural and human-placed origin will be identified with tags by Oregon State University researchers. OSU researchers plan to examine wood, substrate and channel response to restoration effort. A pre-project examination of the restoration reach was made by

the OSU researchers in anticipation of the project and existing large wood was tagged during that survey (September 2001).

### **Alternative B – Proposed Action**

Alternative B proposes the identical supplementation of woody material described in Alternative A, with supplementation of spawning substrate in addition to wood placement action. Following placement of large wood, channel substrates will be monitored annually to determine if sufficient gravels for spawning spring chinook salmon and bull trout are recruited by woody material accumulations. If sufficient material does not accumulate, gravels will be supplemented by importing gravel alluvium. Placement of gravel would occur near placed wood accumulations using a full suspension bucket, provided by ground-based yarding equipment, or helicopter. Sufficient gravel is defined as 12 cubic yards of material suitable as spawning habitat for spring chinook or bull trout (1 to 4 inch in diameter) upstream and downstream of each large wood accumulation. Importation of gravel material would supplement recruited materials to achieve a 12 cubic yard gravel accumulation in the vicinity of each large wood accumulation.

Imported spawning gravels will not require treatment to neutralize potential pathogens prior to importation to the project site. Potential pathogens are currently transmitted into the restoration reach via spring chinook salmon that are transported above Trail Bridge Dam by ODFW. Imported substrates will require cleaning to remove fine sediment and potential noxious weed contamination. Implementation of aerial placed spawning substrates would occur from the helicopter landing on Rd 683, as wood placement is described in Alternative A, or by ground-based equipment placement from Rd 735 surface using suspended bucket. Equipment cleaning precautions will be utilized to avoid potential introduction of noxious plants. Seasonal operation restrictions will be used to avoid disturbance of wildlife and fisheries resources.

### **Alternative C – No Action**

Alternative C – No Action, would not implement actions to restore in-stream large woody material or gravel substrate in the Upper McKenzie project area. 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. The No Action alternative provides a basis for describing the environmental effects of the proposed action and other alternatives.

### **Mitigation Measures**

A number of mitigation measures accompany Alternatives A and B. Mitigation measures help define the alternatives by describing more specifically how the actions would be accomplished and how the resources would be protected. The following list describes protections that will be in place to protect various resources with project implementation. It includes operating restrictions and safety measures. Though they are not all described here, all applicable Standards and Guidelines from the Willamette Forest Plan as amended would also be part of Alternatives A and B.

**Soil, Watershed, and Fisheries Protection:**

Road maintenance would be done during periods of dry ground conditions to minimize erosion and sedimentation, and stable fill would be constructed across all stream crossings.

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.

Imported woody material with roots would be rinsed of soils to prevent introducing fine sediments to the river channel.

Ground-based systems employed to deliver spawning substrates to the river channel would operate from existing road surfaces or substrates would be delivered aerially by helicopter. 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 the presence of spring chinook, bull trout, cutthroat trout and rainbow trout (implementation would occur July 1 to August 15).

Areas of disturbance and exposed soil will be seeded with non-invasive cereal grains such as winter wheat and native perennial species.

Spill plans would be in place prior to any equipment work near aquatic habitat.

**Wildlife:**

To reduce potential disturbance to any nesting spotted owls in the area, seasonal restrictions would be imposed on disturbance activities within 0.25 miles of spotted owl activity centers. Similar restrictions would apply for peregrine falcons bald eagles, 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.

Sources of rock used as spawning substrate need to be free of noxious weeds.

Disturbed areas will be seeded with non-invasive cereal grains such as winter wheat and native perennial species.

**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.

**Recreation and Human Safety:**

Felling of trees within riparian reserves will be done to provide for public and operational safety, and would be coordinated with the IDT to protect resource values.

**Effects Analysis**

Changes to the sediment regime, stream temperatures, peak flows and large wood supply all have potential to affect aquatic habitat and fish populations.

**Sediment****Alternative A and B**

Potential to introduce fine sediment with stream adjacent activity is mitigated with distance of placement equipment from the channel. Cable-lining live trees into the channel would be accomplished using a cable drum located above the river on the Rd 735. Rd 735 is located on a terrace generally further than 300 feet to the McKenzie River channel. The cable-lining equipment is mounted on rubber tires and the vehicle would remain on the road surface. Potential to introduce sediment from this road surface is minimal due to the road's flat character and distance from the channel. Potential to introduce fine sediments through utilization of stream adjacent riparian trees will be mitigated with scattering duff and slash over exposed soils and seeding with native grasses. The small area of disturbance would consist of 17 uprooted trees dispersed over the 1 mile long reach, resulting in a negligible increase in fine sediment available to migrate to the river channel. Helicopter placement of imported material would not introduce fine sediments of measurable quantity to the river channel. All imported material will be rinsed from root soils prior to placement. Similarly, if substrates are imported to the spawning reach, clean material will be used. Road maintenance (1/4 mile of Rd 683) for access to the helicopter service landing and ground-based equipment utilized in this project would not contribute to degradation of aquatic habitat due to distance from the channel and short-duration of project activities. Habitat quality essential to native and listed species would be maintained with project activities and mitigations.

What is interpreted as an altered flow and sediment regime in the restoration reach has resulted from diversion of majority flow at Carmen Dam. The restoration project addresses the altered sediment supply with importation of spawning-sized substrates into the reach, should recruitment of material not meet the expectations of project design. The short-term treatment of the reach with addition of spawning-sized substrates would address the immediate needs of bull trout isolated above Trail Bridge Dam, and spring chinook transported above the dam by ODFW (5-10 year period). The long-term recruitment of wood and sediment in the restoration reach is expected to provide sufficient spawning and rearing habitat for spring chinook and bull trout (10 years and beyond).

**Alternative C**

No potential to increase fine sediment supply to the McKenzie River channel exists with the No Action Alternative

## **Stream Shade and Temperature**

### **Alternative A and B**

The stand of trees adjacent to the Upper McKenzie River restoration reach is described as predominately Douglas fir with a hemlock and cedar understory. The stand is a multi-layered canopy with Douglas fir old growth representing the survivors of a near stand replacement fire that occurred about 140 years ago. The majority of the stand is composed of a Douglas fir, hemlock and cedar understory averaging 140 years old and measuring 135 feet tall. The stand is considered fully stocked due to the following indicators: 1) Suppression of saplings is occurring with 1-3 inch diameter trees averaging 21 years old. 2) A suppressed rate of growth on all but dominant trees. 3) A canopy more than 75% closed. 4) A stand replacement fire approximately 140 years ago and uniform regeneration. 5) A stand density index of 485 reflects a dominant suppressing overstory is inducing mortality in the understory.

The seventeen trees identified for providing key features in this reach are dispersed along both banks of the McKenzie River in the project area. Placing 17 trees in a dispersed fashion in the spawning reach will maintain the remaining stand (approximately 66 trees/acre over 17 inches in diameter) and would utilize 1% of the existing stand within 100 feet of the river channel. Discerning those trees placed into the channel would be difficult for the casual observer, as they would appear as fallen trees into the channel, with rootmass intact and natural in appearance. Utilization of stream adjacent trees will result in a reduction of 3.7% 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 3.7% 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 0.005° Fahrenheit, essentially an immeasurable difference between pre-project and post-treatment condition. Utilization of live trees would not significantly change the vegetative composition, age structure, quantity, or vigor of riparian stands. In addition, the upper McKenzie River is a spring-fed system and this flow provides a consistent source of cold, clean water.

### **Alternative C**

No potential to decrease stream shade or increase water temperature in the McKenzie River exists with the No Action Alternative.

## **Peak Flows**

### **Alternative A, B and C**

No potential to influence peak flows exists with action or no action alternatives due to the slight alteration of vegetation (Alternative A and B) or no alteration of vegetation (Alternative C).



## **Large Wood and Aquatic Habitat Quality**

### **Alternative A and B**

The placement of wood is designed to encourage a mostly straight, single channel to provide varying velocity breaks and allow deposition of finer spawning substrates. This would be achieved mainly through increased channel roughness. By importing approximately 50 pieces of LWM, the proposed final density of large woody material would be about 80 pieces in the 1.0 mile reach. The resulting reduction in water velocities would allow deposition of gravels and cobbles immediately above and below structures, and deposition of finer sediments and vegetative litter and detritus within backwaters and off-channel areas. Plunge pools and scour pools are expected to form within the active channel downstream of, and adjacent to wood structures. The additional roughness supplied in this project would encourage the channel to meander, however channel migration would be limited due to channel type. The Upper McKenzie River channel is described as a Rosgen type B3 channel, with channel materials dominated by cobbles, and slope range from 2-3%. Type B3 channels are typically constrained by valley walls and characterized by narrow flood plains. In the case of the Upper McKenzie River, restoration wood is expected to stabilize periodic areas of flow refuge of value to spawning bull trout, spring chinook, cutthroat and rainbow trout, as well as rearing juveniles. 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. In fact, nutrient retention would be beneficial to all organisms in the upper McKenzie River. On their way from headwaters to the river mouth, organic matter and nutrients are repeatedly transported, retained, metabolized, and exported in a cycling process called “spiraling” (Newbold et al. 1982; as cited in Murphy and Meehan 1991). To contribute energy to the food web of a stream reach, organic material must first be retained in the channel where it can be processed (Murphy and Meehan 1991). Large woody debris has a key role in the retention of organic detritus.

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 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 pre-management condition would not affect the free-flowing character of the river, as natural conditions of flow would be maintained. Water quality would be maintained with restoration of channel complexity.

Alternative B includes the same protective measures as Alternative A for protection of soil, water and fisheries resources. As Alternative B includes potential supplementation of spawning substrates, additional protections for aquatic habitat quality would be implemented. Equipment used in placement of substrates would work from existing road surfaces or the substrates would be delivered by helicopter to protect riparian resources. Project monitoring will determine

whether adequate volumes of spawning substrate are recruited in the restoration reach, and whether importation of spawning gravel is necessary.

The restoration project is designed to improve aquatic conditions providing habitat for listed and native species. It is expected spawning and rearing habitat conditions will improve for all salmonids following implementation.

### **Alternative C**

The No Action Alternative proposes no activities that would create risks to soil and water resources. However, the alternative allows existing problems such as low in-stream wood density and simplified at-risk species habitat to continue untreated and dependant upon natural rates of input to replenish existing condition. Riparian and aquatic 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 largely on the natural rate of stream adjacent blowdown and deadfall. Recruitment of wood and substrate from upstream of the project area would be expected to remain low with the diversion of most flow at Carmen Reservoir. Alternative C would not meet the purpose and need for action to restore aquatic habitat conditions. It would not take action to provide restored habitat for ESA listed bull trout and spring chinook salmon, as directed by the Willamette Forest Plan as amended.

### **Cumulative Effects**

The analysis of cumulative effects considered past, present, and reasonably foreseeable future actions on these lands. The Carmen-Smith hydroelectric project is currently in process of re-licensing with the Federal Energy Regulatory Commission and other federal, state and regulatory agencies. Future restoration projects in the vicinity of this project are probable. One such project under consideration is fish passage at Trail Bridge Dam. This action would reconnect lower McKenzie River with upper reaches. The effects and costs of such projects will be evaluated by Eugene Water & Electric Board and participating agencies. Re-licensing of the hydroelectric project is scheduled to be complete in 2008. Projects under consideration and associated with re-licensing are not yet clearly defined.

The Two Bee Landscape Project is a timber management/roads treatment project proposed to the north and west of the restoration project. The thinning project would not increase sources of sedimentation in the restoration reach, as proposed thinning stands and roads are located at a distance from the spawning reach to reduce potential sources of sedimentation to an immeasurable amount. Similar negligible quantities of sedimentation are expected from the Robinson-Scott Landscape Management Project located in the vicinity of the project area. Riparian Reserves protecting waterways, mitigations and Best Management Practices are currently being utilized with thinning harvest of units to the east of the project area. Past projects in the vicinity of the proposed project include small roadside salvage projects. Most are older than 20 years in age and the effects do not contribute to degradation of aquatic habitat quality. Road systems and maintenance in the project area contribute levels of sedimentation that do not accumulate to degrade water quality and aquatic habitat in the project reach. Most road densities of less than 2.0 miles/square mile upstream of the project area are located on the Ikenick plateau, Bunchgrass Ridge or McKenzie River terraces. Due to the highly porous nature of the drainage and a network that flows over glacial deposits and volcanic flows, transmission of fine sediments

is often intercepted or carried efficiently through the system during high flows. Cumulatively, these projects including the current proposal, would not contribute to degradation of aquatic habitat quality. Stream shade would not be significantly influenced by proposed actions, and stream adjacent activities have been avoided in efforts to maintain water quality. Maintenance of stream adjacent Riparian Reserves is also an emphasis in future projects, as directed by the Willamette National Forest Plan as amended by the Northwest Forest Plan. 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.

### **Endangered Species Act Effects Determination**

#### **Alternative A and B**

Bull trout and spring chinook are present in the project area and are the focus of proposed restoration actions. The project was presented to the Willamette Basin Level One Interagency Consultation Team (Level One Team) and the team concurred with proposed action coverage under Programmatic Consultation (Programmatic dates: USFWS, April 11, 2003; NOAA, Feb. 25, 2003). Project implementation may 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 (after August 15). 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 cable-placed or helicopter-placed tree harming a juvenile is slim, a slim level of risk warrants an LAA assessment. Similarly, placement of spawning substrate is characterized as May Affect, Likely to Adversely Affect, as there is risk of harming juvenile bull trout or spring chinook salmon. There are no aquatic species on the sensitive list, vertebrate or invertebrate, that occur on the McKenzie River Ranger District.

#### **Alternative C**

The No Action Alternative would not be expected to affect bull trout or spring chinook. Alternative C therefore is characterized as a No Effect action.

### **Critical Habitat**

#### **Alternative A and B**

Critical habitat has not been designated for bull trout or chinook upstream Trail Bridge Dam. The reach above Trail Bridge is proposed as Critical Habitat for bull trout (USFWS) and Critical Habitat designation is currently under review by NOAA for the Upper Willamette ESU for spring chinook. For the purpose of this project and Biological Evaluation, the US Forest Service considers habitat upstream of Trail Bridge Dam critical to the continued existence of bull trout and spring chinook in the McKenzie River. The restoration project is designed to improve aquatic conditions providing habitat for listed species. It is expected spawning and rearing habitat conditions will improve for bull trout and spring chinook following implementation. Short-term channel readjustment to imported woody material and substrate presents a minimal risk to target species of restoration. Long-term benefits of flow deflection and substrate deposition is expected to improve conditions for spawning and rearing in the reach.

Characterization of implementation of Alternative A and B is described as May Affect, but Not Likely to Adversely Affect (NLAA) proposed Critical Habitat.

### **Alternative C**

The No Action Alternative provides a continuation of existing condition of aquatic habitat in the restoration reach. The No Action Alternative would not be expected to affect bull trout or spring chinook. Alternative C therefore is characterized as a No Effect action.

### **Magnuson-Stevens Act and Essential Fish Habitat**

When the Magnuson-Stevens Act of 1976 was re-authorized in 1996, it directed Regional Fishery Management Councils to identify Essential Fish Habitat (EFH) for commercial fish species of concern. The Pacific Fishery Management Council identified EFH in the Willamette Basin in June 2000. The Magnuson-Stevens Act requires Federal Agencies to consult with the Secretary of Commerce (NMFS) regarding any action authorized, funded, undertaken by such agency which may adversely affect EFH. The National Marine Fisheries Service has identified the waters upstream from Trail Bridge Dam as Essential Fish Habitat for spring chinook salmon. Effects analysis contained in the Biological Evaluation address potential effects to EFH (i.e., effects to spring chinook salmon habitat). The effects analysis presented in this effects summary indicates minimal risk of adversely affecting watershed condition. The Biological Assessment finds that a “May Affect, Not Likely to Adversely Affect” determination for spring chinook salmon is appropriate in summarizing effects to habitat. Therefore it is expected that the Upper McKenzie Aquatic Restoration Project will have a minimal effect to EFH. It is determined that proposed projects do not exceed the “May Adversely Affect” EFH threshold and are therefore not subject to EFH consultation with NOAA Fisheries. EFH does not apply to bull trout and other native fish as they are not a component of a commercial fishery.

Prepared by:

/s/Dave Bickford

DAVE BICKFORD

Assistant District Fisheries Biologist

Reviewed by:

/s/Ramon Rivera

RAMON RIVERA

Lead District Fisheries Biologist

## **References**

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# Appendix C: Botany



United States  
Department of  
Agriculture

Forest Service  
Willamette National Forest  
McKenzie River Ranger District

McKenzie Bridge,  
OR 97413  
Tel (541) 822-3381  
FAX (541) 822-7254

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Date: 20 February 2004

File Code: 2670 Botany

Subject: Upper McKenzie Aquatic Restoration Project BE

## I. Introduction

### Purpose:

The purpose of this Biological Evaluation is to review the Upper McKenzie Aquatic Restoration Project in sufficient detail as to determine whether the proposed action will result in a trend toward Federal listing of any sensitive plant species.

### Plant Species of Concern:

Current management direction mandates conservation of several categories of rare plants of the Willamette National Forest. Protection of federally listed Threatened and Endangered species is mandated by the Endangered Species Act. No federally listed Threatened or Endangered, or proposed plants, nor suitable habitat for these listed plants are known to occur in the project area. Sensitive species are protected by USDA Forest Service regulations and manual direction (FMS 2672.4).

Prefield reviews were conducted to determine which species from the Regional Foresters 2003 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 plant species within the project area. There is potential habitat for six sensitive species (see Attachment A).

## II. Description of the Proposed Project

### Location Description:

The proposed projects for the Upper McKenzie Aquatic Restoration Project are located in the Upper McKenzie Watershed on the McKenzie River Ranger District, Willamette National Forest, OR. The legal location for the project is: T.15S., R.6E., Section 1.

The reach between Trail Bridge Reservoir to near Kink Creek confluence (approximately one mile long) is known spawning habitat for bull trout isolated above Trail Bridge Dam. This project proposes supplementation of existing debris, currently at a density of 7 pieces of large wood per mile (>24 inch diameter by 50 foot length), to act as flow deflection and capture spawning gravels necessary to maintain the isolated population of bull trout above Trail Bridge Dam. The desired density of large woody debris is approximately 80 pieces per mile.

### Alternative A:

The project would supplement existing large woody debris with trees selected from the adjacent riparian reserve, and also import debris from nearby upland sources. Imported woody material would also be supplemented by carrying in loads with the use of a helicopter. Woody material



placement would be done with cable pulling and suspension placement of live trees removed from the riparian reserve. Proposed final density of large woody material would be about 70 trees in the one-mile reach, by importing approximately 60 pieces of LWD. Approximately 10-20 trees will be selected from the adjacent riparian reserve to serve as “key” features behind which imported material will stabilize. Woody material jams would consist of 4-6 pieces in off-bank accumulations. Several opportunities exist for channel spanning accumulations. For helicopter use, a service landing is available nearby at the end of Rd 682.

**Alternative B:**

Alternative B proposes the identical supplementation of woody material described in Alternative A, plus supplementation of spawning substrate. If an adequate amount of spawning material has not accumulated in the large woody debris, a helicopter would add gravel to the river at the sites of the large woody material.

**Alternative C – No Action:**

Alternative C – No Action, would not implement restoration actions recommended in this environmental analysis. The no action alternative provides a basis for describing the environmental effects of the proposed action and other alternatives.

Alternative C would not meet the purpose and need for action to restore aquatic habitat conditions. It would not take action to provide restored habitat for ESA listed bull trout and spring chinook salmon, as directed by the Willamette Forest Plan.

**III. Existing Environment**

**Management Areas:**

The proposed projects would occur in the following Willamette Forest Plan Management Areas: MA-6c, Designated Wild and Scenic River – McKenzie River; MA-11f, Scenic - Retention Foreground; and MA-15, Riparian Area.

**Survey Results:**

Field surveys using the intuitive-control method were conducted during September of 2001. Surveys were conducted by Tamen Earhart, Ron Hamill, and Eric Muench, of Cryptogam Research Associates. Concentrated surveys were conducted in areas of suspected suitable habitat for sensitive plants. No sensitive plant species from the 2003 Regional Forest’s Sensitive Plant List for the Willamette National Forest were located during the survey. There were no changes to the Sensitive Plant List for the Willamette National Forest from 2001 to 2003.

**IV. Impacts of the Proposed Project**

**Direct and Indirect Impacts:**

This project will cause no direct or indirect effects to sensitive plant because no sensitive plants were observed during surveys of the project area.

**Cumulative Effects:**

There are no cumulative effects to sensitive plant species because no sensitive plants were observed during surveys of the project area.

**Compliance with Management Direction:**

This Biological Evaluation has documented the completion of the steps outlined in the Regional Office directive on the 2670 section of the Forest Service manual.

**V. Determinations**

It is my determination that selection of any of the alternative will have no effect on sensitive plants and their associated habitat because no sensitive plant species occur within the Upper McKenzie Aquatic Restoration Project area.

Prepared by: /s/Susan Stearns\_\_\_\_\_  
Susan Stearns District Botanist  
McKenzie River Ranger District

Date: 20 February 2004\_\_\_\_



**Attachment A: Willamette National Forest 2003 Sensitive Plant Species List**

Species	Habitat Present in Project Area	Species Present in Project Area
<i>Agoseris elata</i>	N	N
<i>Arabis hastatula</i>	N	N
<i>Arnica viscosa</i>	N	N
<i>Asplenium septentrionale</i>	N	N
<i>Aster gormanii</i>	N	N
<i>Aster vialis</i>	Y	N
<i>Botrychium minganense</i>	N	N
<i>Botrychium montanum</i>	Y	N
<i>Botrychium pumicola</i>	N	N
<i>Calamagostis breweri</i>	N	N
<i>Carex livida</i>	N	N
<i>Carex scirpoidea</i> var. <i>stenochlaena</i>	N	N
<i>Cimicifuga elata</i>	Y	N
<i>Coptis trifolia</i>	Y	N
<i>Corydalis aqua-gelidae</i>	Y	N
<i>Frasera umpquaensis</i>	N	N
<i>Gentiana newberryi</i>	N	N
<i>Iliamna latibracteata</i>	Y	N
<i>Lewisia columbiana</i> var. <i>columbiana</i>	N	N
<i>Lycopodiella inundata</i>	N	N
<i>Montia howellii</i>	N	N
<i>Ophioglossum pusillum</i>	N	N
<i>Pellaea andromedaefolia</i>	N	N
<i>Polystichum californicum</i>	N	N
<i>Potentilla villosa</i>	N	N
<i>Romanzoffia thompsonii</i>	N	N
<i>Scheuchzeria palustris</i> var. <i>americana</i>	N	N
<i>Sisyrinchium sarmentosum</i>	N	N
<i>Utricularia minor</i>	N	N
<i>Wolffia borealis</i>	N	N
<i>Wolffia columbiana</i>	N	N



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Date: 20 February 2004

File Code: 2670 Botany

Subject: Upper McKenzie Aquatic Restoration Project Supplemental Botany Report

This document serves as the Botanical Resource Report for the Upper McKenzie Aquatic Restoration Project on the McKenzie River Ranger District, Willamette National Forest. The legal location for the Planning Area is: T.15S., R.6E., Section 1.

### Sensitive Plants

A prefield review showed no known populations of sensitive plants listed on the Regional Forester's 2003 Sensitive Plant List for the Willamette National Forest. Potential habitat for six sensitive plant species occur in the project area. No sensitive plant species were observed during surveys of the project area.

### Survey and Manage Species

The Upper McKenzie Aquatic Restoration Project area contains late-successional/old-growth habitat and potential habitat for survey and manage vascular plants, lichens, bryophytes, and fungi. Surveys were conducted for Category A and C vascular plants, lichens, bryophytes, and fungi. See attached prefield review form for results of the survey. All survey and manage species known to occur in the project area will receive a 180' no-harvest buffer to maintain the microclimate of the site.

### Noxious Weeds

The new invader/noxious weed species spotted knapweed (*Centaurea maculosa*) and diffuse knapweed (*Centaurea diffusa*) occur along State Highway 126 FS road 2600-730 and 2600-655.

The following mitigation measures will be implemented to reduce the introduction and spread of noxious weeds in the project area:

- All equipment utilized in restoration activity would be pressure washed to remove all dirt and debris prior to entering National Forest System lands.
- All equipment working off road or disturbing soil in areas where there are existing populations of spotted knapweed and diffuse knapweed would be pressure washed to remove all dirt and debris prior to leaving the site. The District botanist would designate the cleaning sites.
- 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.
- Sources of rock used as spawning substrate need to be free of noxious weeds.
- Disturbed areas will be seeded with native perennial species.



Prepared by: /s/ Susan Stearns Date: 20 February 2004  
 Susan Stearns District Botanist  
 McKenzie River Ranger District

**Results of Prefield Review and Field Reconnaissance  
 for  
 Survey and Manage Plant Species  
 Willamette National Forest: FY 2004**

Project Name: Upper McKenzie Aquatics Restoration Project Unit #(s):                     

Township: 15S Range: 6E Section(s): 1

Is the project ground disturbing? Yes  (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?
<i>*<sup>1</sup>Botrychium minganense</i>	N	9/27/01	Eric Muench	N	N
<i>*Botrychium montanum</i>	N			N	N
<i>Bridgeoporus nobilissimus</i>	N			N	N
<i>*Coptis trifolia</i>	N			N	N
<i>*Corydalis aqua-gelidae</i>	N			N	N
<i>Cypripedium montanum</i>	N			N	N
<i>Dendriscoaulon intricatum</i>	N			N	N
<i>*Eucephalus vialis</i>	N			N	N
<i>Hypogymnia duplicata</i>	N			N	N
<i>Leptogium cyanescens</i>	Y			N	N
<i>Lobaria linita var. tenuoir</i>	N			N	N
<i>Nephroma occultum</i>	Y			Y	N
<i>Pseudocyphellaria rainierensis</i>	Y			Y	N
<i>Schistostega pennata</i>	N			N	N
<i>Tetraphis geniculata</i>	Y			N	N

Signature:

/s/Susan Stearns  
 Botanist

20 February 2004  
 Date

<sup>1</sup> \* Starred species are also on the Willamette NF Sensitive Species List

Species	Recommendations	Comments
<i>Botrychium minganense</i>		
<i>Botrychium montanum</i>		
<i>Bridgeoporus nobilissimus</i>		
<i>Coptis trifolia</i>		
<i>Corydalis aqua-gelidae</i>		
<i>Cypripedium montanum</i>		
<i>Dendriscoaulon intricatum</i>		
<i>Eucephalus vialis</i>		
<i>Hypogymnia duplicata</i>		
<i>Leptogium cyanescens</i>		
<i>Lobaria linita var. tenuior</i>		
<i>Nephroma occultum</i>	<b>Do not harvest trees with in 180' of the site</b>	
<i>Pseudocyphellaria rainierensis</i>	<b>Do not harvest trees with in 180' of the site</b>	
<i>Schistostega pennata</i>		
<i>Tetraphis geniculata</i>		

## APPENDIX D

### WILDLIFE BIOLOGICAL EVALUATION

#### Upper McKenzie Wood Placement Project

June 26, 2003

Alternatives considered in the Upper McKenzie Wood Placement Project require a Biological Evaluation to be completed (FSM 2672.4). The Biological Evaluation process is intended to analyze and document activities to ensure proposed management actions:

1. Do not contribute to loss of viability of any native or desired non-native plant or animal species;
2. Incorporate concerns for sensitive species throughout the planning process, reducing negative impacts to species and enhancing opportunities for mitigation;
3. Ensure that activities will not cause a species to move toward federal listing;
4. Comply with the requirements of the Endangered Species Act that actions of Federal agencies not jeopardize or adversely modify critical habitat of Federally listed species;
5. Provide a process and standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision making process (FSM 2672.41 ID and 2672.41).

Species evaluated include:

- Species listed or proposed to be listed as endangered (E) or threatened (T) by the USDI Fish and Wildlife
- Species listed as sensitive (S) by USDA Forest Service Region 6.

### **I. INTRODUCTION**

This Wildlife Biological Evaluation determines the effects of all alternatives of the EA on any proposed, threatened, endangered, or sensitive fauna that may occur within the analysis area. This evaluation, required by the Interagency Cooperation Regulations (Federal Register, January 4, 1978), ensures compliance with the Endangered Species Act of 1973, P.L. 93-205 (87 Stat. 884) as amended.

#### ***Project Location and Description***

The Upper McKenzie Aquatic Restoration Project Area covers 1.0 miles of McKenzie River channel within the Upper McKenzie River Watershed on the McKenzie River Ranger District. Proposed actions would occur in the McKenzie River reach located immediately upstream (north) of Trail Bridge Reservoir, ending just north of the confluence of Kink Creek with the

McKenzie River, a distance of 1.0 mile. The river elevations range from 2,200 ft. at Trail Bridge Reservoir to 2,250 ft. near Kink Creek confluence with the McKenzie River.

This BE evaluates 3 alternatives: 1 no action and 2 action.

### **Alt. A**

The Upper McKenzie River Aquatic Restoration Project proposes supplementation of existing woody material to act as flow deflection and capture spawning gravels. The large woody material would be placed in the McKenzie River channel upstream of Trail Bridge Dam. Existing large woody material would be supplemented with trees selected from the adjacent riparian reserve, and with imported woody material from nearby upland sources.

### **Alt. B, Proposed Action**

Alternative B proposes the identical supplementation of woody material described in Alternative A, plus supplementation of spawning substrate. Following placement of large wood, channel substrates will be monitored annually to determine if sufficient gravels for spawning spring chinook salmon and bull trout are recruited around woody material accumulations. If sufficient material does not accumulate, gravels will be supplemented by importing gravel alluvium. Placement of gravel would occur near placed wood accumulations using a full suspension bucket, provided by ground-based yarding equipment, or helicopter. Sufficient gravel is defined as 12 cubic yards of material suitable as spawning habitat for spring chinook or bull trout (1 to 4 inch in diameter) downstream of a large wood accumulation. Importation of gravel material would supplement recruited materials to achieve a 12 cubic yard gravel accumulation downstream of each large wood accumulation.

Imported spawning gravels would be cleaned off-site to remove fine sediments and potential noxious weed contamination. Implementation of aerial placed spawning substrates would occur from the helicopter landing on Rd 683 or from Rd 735 by cable suspended bucket, as described in Alternative B. Equipment cleaning precautions will be utilized to avoid potential introduction of noxious plants.

### **Alt. C, No Action**

This alternative would not implement actions to restore in-stream large woody material or gravel substrate in this Key 1 Watershed area. This alternative allows existing problems such as low in-stream wood density and simplified at-risk species habitat to continue untreated and dependant upon natural rates of input to replenish existing condition.

## **II. RISK ASSESSMENT PROCESS**

This Biological Evaluation covers a 6-step process to identify proposed, threatened, endangered, and sensitive wildlife species that may be associated with the project area, and to evaluate any impacts the project may have to those species:

1. Review of existing documented information.

2. Field reconnaissance of the project area for evidence of species or habitat
3. Evaluation of the impacts of the project to suspected or known local populations of TE&S species.
4. Analysis of the significance of the project's effects on local and entire populations of TE&S 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 FWS is initiated at appropriate stage as outlined in FSM 2673.2-1, or is otherwise arranged through formal channels.

A summary of the Biological Evaluation process for species that occur on the Regional Forester's Sensitive Species list as of January 2002, and that also have potential to occur in this project area, is displayed below

The entire analysis area has been surveyed for potential habitat on aerial photos, and to a large extent, on the ground. Surveys completed are described on the following pages by species. Specific wildlife surveys are not required if potential habitat is not present or if the proposed alternatives would avoid impacts to potential habitat (FSM ID 2672.43, 1992).

### III. AFFECTED WILDLIFE

Table 1: Summary of Impact Determinations for Animal Species on the Regional Forester's Sensitive Species List, Willamette National Forest (2002).

TES Species	Habitat	Impact/Required Mitigation
Least Bittern <i>Ixobrychus exilis</i>	No Habitat	NI
Bufflehead <i>Bucephala albeola</i>	No Habitat	NI
Harlequin Duck <i>Histrionicus histrionicus</i>	Yes --Habitat Class I, II and III streams	NI / w <i>Seasonal restriction on felling or placement of trees/gravel during nesting season March 1 – July 15. This RX results in a NI because nesting season will be protected from disturbance; habitat will be improved with additional wood for loafing structure and cover.</i>
Yellow Rail <i>Coturnicops noveboracensis</i>	No Habitat	NI
Black Swift <i>Cypseloides niger</i>	No Habitat	NI
Tricolored Blackbird <i>Agelaius tricolor</i>	No Habitat	NI
Baird's Shrew <i>Sorex bairdii permiliensis</i>	Yes-- Forest	<i>NI/felling of limited # of individual trees will not degrade function of shrew habitat. May improve habitat where boles add to upland forest structure.</i>
Pacific Shrew <i>Sorex pacificus cascadenis</i>	No Habitat	NI

TES Species	Habitat	Impact/Required Mitigation
California wolverine <i>Gulo gulo</i>	Yes -- Higher elevation mature forest	NI/felling of limited # of individual trees will not degrade function of wolverine habitat. May improve habitat where boles add to upland forest structure
Pacific Fisher <i>Martes pennanti</i>	Yes --Higher elevation mature forest	NI/felling of limited # of individual trees will not degrade function of fisher habitat. May improve habitat where boles add to upland forest structure.
Pacific Fringe-tailed Bat <i>Myotis thysanodes vespertinu</i>	No Habitat	NI
Canada Lynx <i>Felis lynx canadensis</i>	No Habitat	NI
Oregon Slender Salamander <i>Batrachoseps wrighti</i>	No Habitat	NI
Cascade Torrent Salamander <i>Rhyacotriton cascadae</i>	No Habitat	NI
Foothill Yellow-legged Frog <i>Rana boylei</i>	No Habitat	NI
Oregon Spotted Frog <i>Rana pretiosa</i>	No Habitat	NI
Northwestern Pond Turtle <i>Clemmys marmorata marmorata</i>	No Habitat	NI
Northern Spotted Owl <i>Strix occidentalis</i>	Yes - Mature Forest	NE w/ <i>Seasonal Restriction on felling or placement of trees/gravel during nesting season March 1 – July 15 or until non-nesting verified.</i>  <i>This RX results in NE because seasonal restrictions will eliminate disturbance during critical nesting periods and felling of limited # of individual trees will not degrade function of owl habitat. Activity may improve habitat where boles add to upland forest structure.</i>
Peregrine Falcon <i>Falco peregrinus anatum</i>	Potential for disturbance in primary and secondary zones	NI w/ <i>Season Restriction on felling or placement of trees/gravel during nesting season January 15 – July 31 or until non-nesting verified.</i>  <i>This RX will result in NI because seasonal restrictions will eliminate disturbance during critical nesting periods.</i>
Bald Eagle <i>Haliaeetus leucocephalus</i>	No habitat in trees to be felled; no eagles in vicinity	NE
Mardon Skipper <i>Polites mardon</i>	No Habitat	NE



**Effects Key:**

**NI / NE==** No Impact for Sensitive Species. **No Effect for TE species.**

**NLCT =** May impact individuals or their habitat, but the action will Not Likely Contribute to a Trend towards Federal Listing or loss of viability to the population or species.

**MCT =** May impact individuals or their habitat, with a consequence that the action May Contribute to a Trend towards Federal Listing or a loss of viability to the population or species.

**BI =** Beneficial Impact.

**IV. BIOLOGICAL EVALUATION SUMMARY:**

**Action Alternatives A and B:**

Consultation was not required with the USFWS because the action alternatives do not result in a “May Effect” determination for any TE species with seasonal restrictions in place.

Harlequin Duck: Seasonal restriction on felling or placement of trees/gravel during nesting season March 1 – July 15.

Northern Spotted Owl: Seasonal Restriction on felling or placement of trees/gravel during nesting season March 1 – July 15 or until non-nesting verified.

Peregrine Falcon: Season Restriction on felling or placement of trees/gravel during nesting season January 15 – July 31 or until non-nesting verified.

Potential beneficial Impacts/Effects for Baird’s Shrew, harlequin duck, spotted owls, pacific fisher, and wolverine because of increased large woody debris in the ecosystem.

**No Action Alternative C**

Habitat for Baird’s Shrew, harlequin duck, spotted owls, pacific fisher, and wolverine would not be improved through the addition of woody material to the ecosystem.

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Prepared by:            /s/ Cheryl A. Friesen            6/26/03  
                                 District Wildlife Biologist

Attachment 1: Summary of Biological Background for Animal Species on the Regional Forester's Sensitive Species List, Willamette National Forest (September 2002).

Species	Habitat
<b>BIRDS</b>	
<p>Northern Spotted Owl <i>Strix occidentalis caurina</i></p> <p><i>Status: Threatened</i></p>	<p>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 (&gt; 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/ &gt; 2 canopy layers; overstory trees &gt; 21" DBH; abundant snags/down wood; and a 60-80% canopy closure. Dispersal habitat = forest w/ &gt; 11" DBH trees and &gt; 40% canopy closure. Numerous nests recorded on the McKenzie River RD.</p>
<p>Northern Bald Eagle <i>Haliaeetus leucocephalus</i></p> <p><i>Status: Threatened</i></p>	<p>Use scattered old-growth conifer trees in proximity to 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 Clear Lake and Blue River Reservoir. There have been sightings at Trailbridge, Cougar, and Smith Reservoirs, Fish, Linton and Lost Lakes and along the McKenzie River.</p>
<p>American Peregrine Falcon <i>Falcon peregrinus anatum</i></p> <p><i>Status: Sensitive</i></p>	<p>Preferred nesting sites are sheer cliffs 75 ft. or more in height. They forage within a variety of forest types. Numerous potential and occupied habitat occurs on the McKenzie River RD.</p>
<p>Least Bittern <i>Ixobrychus exilis</i></p> <p><i>Status: Sensitive</i></p>	<p>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 is small platform of sticks and live or dead vegetation, placed in cattails, bulrushes, or bushes 8-14” above water. Sightings of individuals at Fern Ridge and Salem. No recorded sightings or habitat on the McKenzie River RD.</p>
<p>Bufflehead <i>Bucephala albeola</i></p> <p><i>Status: Sensitive</i></p>	<p>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. Only documented wintering on McKenzie River RD.</p>
<p>Harlequin Duck <i>Histrionicus histrionicus</i></p> <p><i>Status: Sensitive</i></p>	<p>During nesting (April-June) adults require fast-flowing water with one + 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. Midstream loafing sites are very important. Broods prefer low gradient streams with adequate macroinvertebrate abundance. Recorded breeding/foraging in tributaries to the McKenzie River and foraging in the McKenzie River.</p>

Species	Habitat
<p>Yellow Rail <i>Coturnicops noveboracensis</i></p> <p><i>Status: Sensitive</i></p>	<p>Feeds in shallow water, eating snails, insects, and some seeds and grasses. Summers on wet meadows, marshes, winters on grasslands, fields, coastal marshes. No documented habitat on McKenzie River RD.</p>
<p>Black Swift <i>Cypseloides niger</i></p> <p><i>Status: Sensitive</i></p>	<p>Found near cliffs in mountainous regions. Feeds on-the-wing eating flying insects. Nests in small colonies on ledges or mountain crevices, often behind a waterfall. There are historical summer records in the Santiam Pass area, Linn County, which suggests breeding in that area. No current sightings on the McKenzie River RD.</p>
<p>Tricolored Blackbird <i>Agelaius tricolor</i></p> <p><i>Status: Sensitive</i></p>	<p>Found in freshwater marshes w/cattails and dense shrubs, grain fields. Feeds on the ground, eating insects, grains, and weed seeds. Nests in large colonies. Nest of coarse reeds and grasses lined with finer material placed in reeds above ground or water. Breeds locally in eastern Rogue Valley, S. Klamath Co, and mainly in north-central Oregon. Scattered summer reports in Willamette Valley. No documented sightings on the McKenzie River RD.</p>
<p><b>MAMMALS</b></p>	
<p>Baird's Shrew <i>Sorex bairdii permiliensis</i></p> <p><i>Status: Sensitive</i></p>	<p>Not much is known of its habitat, but in 1986, 2 specimens were trapped from an open Douglas-fir forested area with numerous rotting logs in Polk Co. It has been trapped on the McKenzie River RD in the Mill Creek area and south as well as in the Blue River watershed.</p>
<p>Pacific Shrew <i>Sorex pacificus cascadenis</i></p> <p><i>Status: Sensitive</i></p>	<p>Generally found in wet or marshy areas along class III-IV streams w/red alder-salmonberry-skunk cabbage and banks with abundant down material. Occasionally found in adjacent conifer forest w/moist abundant decaying logs and brush. Nests made of grasses, mosses, lichens, or leaves. Feed on slugs, snails, insects, and sometimes vegetation. No documented sightings on the McKenzie River RD.</p>
<p>Pacific Fisher <i>Martes pennanti</i></p> <p><i>Status: Sensitive</i></p>	<p>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 maternal females with young. Ground burrows are used 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. Few documented sightings on the McKenzie River RD, mostly in the higher elevations.</p>
<p>California Wolverine <i>Gulo gulo</i></p> <p><i>Status: Sensitive</i></p>	<p>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 move to snowbound lower elevations with very limited human activity. They 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. Rare documented sightings on the McKenzie River RD, mostly at higher elevations.</p>

Species	Habitat
Pacific Fringe-tailed Bat <i>Myotis thysanodes vespertinu</i> <i>Status: Sensitive</i>	Rare in Oregon. Very little known about habitat in Oregon. 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. They eat moths, leafhoppers, lacewings, daddy-longlegs, crickets, flies, true bugs, and spiders. No recorded sightings on the McKenzie River RD.
Canada Lynx <i>Felis lynx canadensis</i> <i>Status: Threatened</i>	At this time, the Regional Forester's Sensitive Species List (2002) designated the lynx as suspected to occur on the Willamette National Forest. This species uses high elevation forested habitats that often coincide with populations of snowshoe hare. Forest conditions are generally lodgepole pine and subalpine fir.
<b>AMPHIBIANS AND REPTILES</b>	
Oregon Slender Salamander <i>Batrachoseps wrighti</i> <i>Status: Sensitive</i>	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. Documented sightings are scattered throughout McKenzie River RD at lower elevations.
Cascade Torrent Salamander <i>Rhyacotriton cascadae</i> <i>Status: Sensitive</i>	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. Larvae 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 stream banks or in streamside forests and talus during rainy periods. Documented sightings from class IV stream headwater areas on McKenzie River RD.
Foothill Yellow-legged Frog <i>Rana boylei</i> <i>Status: Sensitive</i>	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 land adjacent to the Sweet Home RD to the northwest. No documented habitat or sightings on the McKenzie River RD.
Oregon Spotted Frog <i>Rana pretiosa</i> <i>Status: Candidate for Federal Listing</i>	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. The only documented population on the McKenzie River RD occurs in and around Penn Lake in the Three Sisters Wilderness Area.

Species	Habitat
Northwestern Pond turtle <i>Clemmys marmorata marmorata</i>  <i>Status: Sensitive</i>	Inhabits 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, over wintering, and dispersal. They may move up to 500 meters and possibly more for over wintering where they burrow into leaf litter or soil. Nest distances from the water course ranges from 3 meters to over 402 meters. Most nesting areas are characterized by sparse vegetation, usually short grasses or forbs. Documented sightings on the McKenzie River RD are in lower elevation side-channels of the McKenzie River.
<b>INVERTEBRATES</b>	
Mardon Skipper <i>Polites mardon</i>  <i>Status: Candidate for Federal Listing</i>	The USFWS latest review indicated this species occurs in the Puget Sound and southern Cascades area of Washington, in the Siskiyou Mountains of Oregon, and in isolated remnants on serpentine grasslands in Del Norte County, California. They are not known to occur in this part of the Oregon Cascades. They generally occur in grassy openings in subalpine coniferous forests in mountain regions.

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United States  
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McKenzie River  
Ranger District

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**Date:** 6-26-03

**File Code:** 2600 Wildlife

**Subject:** **Wildlife Survey and Manage, Protection Buffer, Mitigation Measure, Management Indicator Species, and Migratory Landbird Analysis for the Upper McKenzie Wood Environmental Assessment, McKenzie River Ranger District**

**Wildlife Survey and Manage, Protection Buffer, Mitigation Measure Species**

The Record of Decision (ROD) for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines (2001) amends the Northwest Forest Plan to provide a more efficient level of species protection. The ROD requires that all habitat-altering projects consider their effects to Survey and Manage, Protection Buffer, and Mitigation Measure species. The species listed in Table 1 occur on the Willamette National Forest.

**Table 1:** Survey and Manage, Protection Buffer, and Mitigation Measure Wildlife Species on the Willamette National Forest (USDA USDI 2001) and results of project surveys. This list was updated in January 2003 following a species status review in 2002.

<b>Species</b>	<b>Management Strategy</b>	<b>Habitat</b>	<b>Potential in Project Area? Survey Results?</b>
<i>Megomphix hemphilli</i> (Linn County only)	A = Rare. Pre-disturbance surveys required. Manage known sites. 172' no-harvest buffer*	Forested areas with a hardwood component and down woody material	Yes. <b>Surveys did not document presence</b>
<i>Pristiloma arcticum crateris</i>	A = Rare. Pre-disturbance surveys required. Manage Known Sites. 172' no-harvest buffer.	Riparian areas with a hardwood component and down woody material	Yes. <b>Surveys did not document presence</b>
Arthropods	F = Status Unknown. Strategic Surveys Required Only. 172' no-harvest buffer.	Unknown	Unknown. Project surveys not required.
Red Tree Vole	C = Uncommon. Pre-disturbance Survey Required. Manage High Priority Sites. 10-acre protection buffer.	Forested stands >10" DBH	Yes. <b>Surveys did not document presence</b>
Great Gray Owl	A = Rare. Pre-disturbance Survey Required. 0.25 mile protection buffer on known site.	Mature stands near openings natural openings or human-made openings that provide appropriate	No habitat in planning area.

<b>Species</b>	<b>Management Strategy</b>	<b>Habitat</b>	<b>Potential in Project Area? Survey Results?</b>
		foraging habitat	
Fringed myotis, silver-haired bat, long-eared myotis, long-legged myotis, and Townsend's big-eared bat.	Protect caves, abandoned mines, abandoned wooden bridges, and abandoned buildings.	Caves, mines, abandoned wooden bridges, and abandoned buildings.	No habitat in planning area.
Black-backed woodpecker	Manage snags to provide for 100% population levels	High elevation forests.	No habitat in planning area
Pygmy nuthatch	Manage snags to provide for 100% population levels	High elevation pine forests.	No habitat in planning area

The alternatives outlined in the Upper McKenzie Wood EA will not affect any of these species because they were not found in the project area.

### **Management Indicator Species**

Management Indicator Species (MIS) were addressed in the Willamette National Forest Plan (1990). They include the spotted owl, pileated woodpecker, marten, elk, deer, cavity excavators, bald eagles, peregrine falcons, and fish. Through Region-wide coordination, each Forest identified the minimum habitat distribution and habitat characteristics needed to satisfy the life history needs of the MIS's. Management recommendations to ensure their viability were incorporated into all WNF FSEIS Action Alternatives. All alternatives in this project meet applicable Standards and Guidelines from the WNF Plan. The amount or characteristics of their required habitat is not significantly changed. With the 1996 and 2001 Amendments to the WNF Plan (i.e. the Northwest Forest Plan, NWFP), persistence for spotted owls, pileated woodpeckers, and marten was evaluated, and the FSEIS indicated persistent populations would be maintained under the NWFP Standards and Guidelines (Appendix J2). All alternatives in this project meet applicable Standards and Guidelines from the NWFP. The felling of a limited number of individual trees will not degrade the function of the forest in this area. Benefits to the habitat may occur from the additional down woody material inputs for species like the spotted owl, pileated woodpecker, and marten.

### **Migratory Landbirds**

A January 11, 2001 Executive Order outlines the "Responsibilities of Federal Agencies to Protect Migratory Birds." Habitats vary broadly for this large group of species. The felling of a limited number of individual trees in late summer may unintentionally take individual migratory birds, but is not expected to have a measurable negative effect on bird populations because of the limited extent of the habitat altered. Because the activity will most likely occur after July 15, nesting season will be avoided.

---

/s/ Shane D. Kamrath, Wildlife Biologist, 6-26-2003

# Results of Prefield Review and Field Reconnaissance for Protection Buffer and Survey and Manage Animal Species

## Willamette National Forest

Project Name: Upper McKenzie Aquatic Restoration Project; Appendix D

Township: 15S                      Range: 6E                      Section(s): 1

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?
<i>Megomphix hemphilli</i> Oregon megomphix	Y	6/19/2001 6/3/2002	Mike Cobb Mike Cobb	N	N
<i>Pristiloma arcticum crateris</i> Crater Lake tightcoil	Y	6/19/2001 6/3/2002	Mike Cobb Mike Cobb	N	N
<i>Strix nebulosa</i> Great gray owl	N	Not required	N/A	N/A	N/A
<i>Phenacomys (Arborimus) longicaudus</i> Red tree vole	Y	7/9/2002	Shane Kamrath	N	N

/s/ Shane D. Kamrath  
Wildlife Biologist

July 9, 2002  
Date



United States  
Department of  
Agriculture

Forest  
Service

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**File Code:** 2350/2520/2630

**Date:** February 4, 2004

**Route To:** Appendix E; Upper McKenzie River Aquatic Restoration Project

**Subject:** Evaluation of the Upper McKenzie River Aquatic Restoration Project  
Upper McKenzie Scenic River  
Section 7, Wild and Scenic Rivers Act

<b>To:</b> Analysis File
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This document summarizes the effects of the proposed Upper McKenzie River Aquatic Restoration Project on the Upper McKenzie River, located within the Upper McKenzie Wild and Scenic River corridor, to determine if the project is consistent with Section 7 of the Wild and Scenic Rivers Act.

Congress designated the Upper McKenzie River from Clear Lake to Scott Creek (excluding Carmen and Trail Bridge impoundments) as a national Wild and Scenic River in 1988. The Upper McKenzie River from Clear Lake to Paradise Campground (omitting the portion between Carmen Reservoir and Tamolitch Pool) was designated by voter initiative as an Oregon Scenic Waterway in 1988. The Upper McKenzie River Management Plan guides management of both the federal and state designated portions of the McKenzie River. In addition, Oregon Administrative Rules, Chapter 736, Division 40 directs activities within the Oregon State Scenic Waterway. The federal classification is as a *Recreational Wild and Scenic River*, the State of Oregon classification is as a *Scenic State Scenic Waterway*.

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 McKenzie River. The Upper McKenzie River is recognized for five ORVs: Scenic, Recreation, Geologic and Hydrologic, Water Quality, and Fish.

#### SECTION 7 DETERMINATION

Based on the analysis below, it is my finding that the proposed Upper McKenzie River Aquatic Restoration 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 they are at an acceptable level. There will be no long-term adverse effects.

/s/ \_\_\_\_\_  
Cheryl Friesen  
Acting District Ranger  
McKenzie River Ranger District



## EVALUATION

Members of the evaluation team were:

Dave Kretzing, Hydrologist  
Phil Raab, Hydropower Coordinator  
Dave Bickford, Fisheries Biologist

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

The primary purpose and need for the Upper McKenzie River Aquatic Restoration Project (Upper McKenzie Project) is to provide the means to restore historic conditions over time and to improve aquatic habitat 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 associated 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 Upper McKenzie 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 (e.g., 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 McKenzie Wild and Scenic 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 Upper McKenzie River Management Plan: MA-6d-15 states, 100% of the existing streamside shade should be maintained. The utilization of 17 large stream adjacent trees to serve as key features in the Upper McKenzie River channel will reduce stream shade by 3.7% along the restoration 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. Low channel complexity and low quantities of in-stream wood have been identified as factors limiting production of native aquatic biota. The LRMP directs active participation in activities that support bull trout recovery (FW-175).

This portion of the Upper 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 maintain stream shade and visual quality of the river corridor, and are spread over the length of the one-mile long reach. Native vegetation will provide substantial vegetative screening due to the high density of evergreen and deciduous vegetation remaining along the restoration reach. The in-stream restoration project is co-sponsored by Oregon Department of

Fish and Wildlife with the objective of recovering the Trail Bridge bull trout and spring chinook 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 has occurred and the project has their approval.

The USDA Forest Service is responsible for protecting the values identified in the Wild and Scenic River Management Plan. Under Section 7(b) of the W&SR's Act, the administering agency is required to determine if this project will directly and adversely affect the Scenic, Recreation, Geologic and Hydrologic, Water Quality, and Fish ORVs present in the area. The effects of this project upon the ORVs of the Upper McKenzie River are evaluated in this Section 7 assessment. The proposed projects are designed to restore channel function of the Upper McKenzie River above Trail Bridge Dam and restore vegetative diversity of stands within the corridor, and must not have an adverse effect on the values of Scenic, Recreation, Geologic and Hydrologic, Water Quality, and Fish ORVs of the river.

## 2) Define the Proposed Activity

A need has been identified for channel restoration in the Upper McKenzie River, located within the boundaries of the Upper McKenzie River Wild and Scenic River area. The proposed project consists of restoration of large wood into the Upper McKenzie River, and potential supplementation of gravel substrate, to restore the function of the channel and aquatic ecosystem. A low density of large woody material (LWM) is present in the main stem McKenzie River above Trail Bridge Reservoir. The reach located between Trail Bridge Reservoir to near Kink Creek confluence, approximately one mile long, is known spawning habitat for bull trout isolated above Trail Bridge Dam. This reach also provides spawning and rearing habitat for spring chinook salmon, transported above the dam by Oregon Department of Fish and Wildlife (ODFW). Both species are listed as Threatened and protected under the Endangered Species Act. The reach serves as proposed Critical Habitat for bull trout. As a Tier 1 Key Watershed providing habitat for at-risk stocks of spring chinook and bull trout, this drainage has been identified as a high priority for watershed restoration efforts. The low volume of large sources of flow deflection and low quantities of gravel accumulation provides little opportunity for spawning bull trout. The Upper McKenzie Restoration project proposes supplementation of existing woody material, currently at a density of 7 pieces of large wood per mile (>24 inch diameter by 50 foot length), to act as flow deflection and capture spawning gravels of sizes necessary to maintain bull trout and spring chinook above Trail Bridge Dam. 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.

The Upper McKenzie River channel is described as deficient in large wood. Bull trout utilize the Upper McKenzie above Trail Bridge Dam as spawning, juvenile and sub-adult rearing and foraging habitat, and adult foraging habitat. Spring chinook salmon use the upper river as spawning and rearing habitat. Currently adult spring chinook salmon are transported via truck around barrier Trail Bridge Dam by ODFW. Recent monitoring of the Trail Bridge bull trout population find the population is very low in number, estimated at 50 adults, and considered at high risk of extinction. 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 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/year/mile).

The Upper McKenzie Restoration proposes addition of large woody material to the McKenzie River channel upstream of Trail Bridge Dam (Figure 1). Existing large woody material would be supplemented with 17 trees selected from the adjacent riparian reserve, and with imported woody material (50 trees) from nearby upland sources. Stream adjacent trees range in size from 16 to 59 inches in diameter and are currently located 20 to 70 feet from the channel. Twelve trees along the east bank, and five trees along the west bank would be pulled over into the channel with root mass intact. The large stream adjacent

Figure 1. Project Area



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 remaining 50 pieces of LWM will be placed aerially in using helicopter. Material will be added to each key piece of woody material, to mimic natural accumulations. Woody material jams will consist of 4-6 pieces in off-bank accumulations, with several opportunities for channel spanning accumulations. Following placement of large wood, channel substrates will be monitored annually to determine if sufficient gravels for spawning spring chinook and bull trout are recruited around woody material accumulations. If sufficient material does not accumulate, gravels will be supplemented by importing gravel alluvium. Placement of gravel would occur near newly placed wood accumulations using a full suspension bucket, provided by ground-based yarding equipment, or helicopter. Sufficient gravel is defined as 12 cubic yards of material suitable as spawning habitat for spring chinook or bull trout (1 to 3 inch in diameter) downstream of a large wood accumulation. Importation of gravel material would supplement recruited materials to achieve a 12 cubic yard gravel volume downstream of each large wood accumulation. A total of 10 large wood accumulations would be placed in the one-mile long reach. No more than 120 cubic yards of alluvium would be imported to supplement gravel behind woody material jams, spread over the one-mile long reach. The presence of river gravels is necessary to maintain an isolated population of bull trout above Trail Bridge Dam, and spring chinook salmon placed above the dam to utilize historic spawning habitat.

For helicopter access, a service landing is located at the end of Rd 2672-683. Road maintenance of Rd 2672-683 (0.25 mile) will be necessary to access a landing on Smith Ridge, located about one air mile west of the restoration reach. Trees with their rootmass intact will be flown from Smith Ridge to the Upper McKenzie River restoration reach. Placement of woody material by helicopter will occur in one to two days, depending upon weather (6-8 hours of flight time). To ensure public safety, the McKenzie National Scenic Trail would be closed 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. 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 specific requirements to ensure contractor safety and spill containment.

The stand of trees adjacent to the Upper McKenzie River restoration reach is described as predominately Douglas fir with a hemlock and cedar understory. The stand is a multi-layered canopy with Douglas fir old growth representing the survivors of a near stand replacement fire that occurred about 140 years ago. The majority of the stand is composed of a Douglas fir, hemlock and cedar understory averaging 140 years old and measuring 135 feet tall. The stand is considered fully stocked due to the following indicators: 1) Suppression of saplings is occurring with 1-3 inch diameter trees averaging 21 years old. 2) A suppressed rate of growth on all but dominant trees. 3) A canopy more than 75% closed. 4) A stand replacement fire approximately 140 years ago and uniform regeneration. 5) A stand density index of 485 reflects a dominant suppressing overstory is inducing mortality in the understory.

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

The placement of wood is designed to encourage a mostly straight, single channel to provide varying velocity breaks and allow deposition of finer spawning substrates. This will be achieved mainly through increased channel roughness. The resulting reduction in water velocities will allow deposition of gravels and cobbles immediately above and below structures, and deposition of finer sediments and vegetative litter and detritus within backwaters and side channels. Plunge pools and scour pools are expected to form within the active channel downstream of, and adjacent to wood structures. The additional roughness supplied in this project will encourage some re-establishment of meander pattern, however channel migration will be limited due to channel type. The Upper McKenzie River channel is described as a Rosgen type B3 channel, with channel materials dominated by cobbles, and slope range from 2-3%. Type B3 channels are typically constrained by valley walls and characterized by narrow flood plains. In the case of the Upper McKenzie River, restoration wood is expected to stabilize periodic areas of flow refuge of value to spawning bull trout and spring chinook, as well as rearing juveniles. 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 large 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 pre-management condition 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.

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

In-stream restoration activity will be located within and beyond the 100-year floodplain of the Upper McKenzie River. Material utilized from the riparian area adjacent to the channel will consist of 17 live trees pulled over into the McKenzie River. Imported material, with intact root-mass, will originate from Smith Ridge, located about 1 mile from the project area (Figure 1). Utilization of live trees will not significantly change the vegetative composition, age structure, quantity, or vigor of riparian stands. Available stream shade will be reduced by 3.7%, and will not result in measurable increase in stream temperature as modeled 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 Upper McKenzie River is known nesting habitat for harlequin ducks and addition of downed wood is expected to benefit harlequin nesting habitat.

Placement of wood within Upper McKenzie River will increase the channel's roughness. Little influence is expected on stream bank stability due to the coarseness of the banks. Encouragement of flow of water onto the floodplain with additional roughness is expected to result in building of the floodplain through deposition of sediment during flood flows. Benefits of restored channel LWM and improved riparian function are expected to provide improved habitat condition for riparian dependent species.

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

For helicopter access, a service landing is located at the end of Rd 2672-683. Reconstruction and resurfacing of Rd 2672-683 (0.25 mile) will be necessary to access a landing on Smith Ridge, located about one air mile west of the restoration reach, atop Smith Ridge. If cultural resources or sensitive wildlife or botanical resources are found on the project site prior to or during project implementation, the resource(s) will be protected by avoidance of the site.

#### 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 Upper McKenzie River is designed to reduce stream energy and allow deposition of spawning sized substrates. The natural condition of flow will be maintained or enhanced by restoration of pre-management in-stream wood densities. Stream bank erosion potential is expected to remain unchanged in the river and sediment routing to be altered in the river through debris interception of bedload gravels and deposition of fines on the floodplain. With additional channel roughness, nutrient trapping may be enhanced within the river as fine organic material is caught up in wood accumulations of benefit to aquatic invertebrates. Fish spawning and rearing success is expected to improve within the Upper McKenzie River due to the increased retention of gravels. 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.

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 alteration of hydrologic processes will occur within the Wild and Scenic corridor with the Upper McKenzie 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 debris in the river. Results of monitoring similar projects in the South Fork McKenzie River (USFS) and in Quartz Creek (OSU) 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 no further than 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 to provide a structure backbone. Placement design will 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 to meet fisheries objectives. Some material migration to Trail Bridge Reservoir is expected to occur due to increased densities of debris in the river above. Entire project migration is not expected in any but the most extreme events. As observed during the 1996 flood in the McKenzie River, the volume of naturally recruited wood was so great that project material could not be distinguished, and project wood only accounted for a small portion of wood migration during the flood. With increased LWM in the river above Trail Bridge Reservoir are associated increased administrative cleanup costs, conducted by Eugene Water & Electric Board. The USDA Forest Service will be responsible for cleanup of LWM of restoration origin in Trail Bridge Reservoir.

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

Restoration of LWM volumes will occur immediately; response of the channel will 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 Upper McKenzie 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 to the Upper McKenzie River 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 50-75 years. The duration of time that placed wood continues to occupy the restoration reach will depend upon flood frequency and decay rates. Flood events in excess of 50-year recurrence interval (approximately 2,500 cfs) may be expected to reposition or transport some portion of restoration material. Margin water alcoves and off-channel habitat will likely be scoured during high flow events with return intervals in excess of approximately 10 years. Immediately, 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 cover and nourishment for macroinvertebrates. Shortly after placement, scour of pools and deflection of flows through dissipation of river energy may begin (> 1.5 year recurrence).

Recruitment of spawning sized gravels is expected to begin immediately, and accelerate in response to 1.5-year recurrence interval floods or greater. Annual monitoring of bedload composition in the vicinity of structures will be used to measure gravel recruitment. If after three years of 1.5-year flows, or a single 10-year event, desirable volumes of spawning gravels have not accumulated, supplementation of spawning gravel will begin. Imported alluvium measuring 1-3 inches in diameter will be placed in the immediate

vicinity (upstream and downstream) of LWM accumulations. Imported gravel will supplement recruited gravel for an accumulation total of 12 cubic yards per woody material complex.

#### 9) Compare Project Analyses to Management Goals and Objectives

The Forest Plan established Management Area 6d for the Wild and Scenic McKenzie 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 modified 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. This portion of the upper McKenzie Wild and Scenic corridor will be managed for a high level of scenic quality. Utilization of dispersed riparian trees for aquatic restoration will maintain a high level of canopy closure (greater than 80%).*

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.

*No temporary roads will be constructed within the Wild and Scenic River corridor with implementation of the Upper McKenzie Project. Restoration material placement systems will utilize helicopter and cable yarding systems to minimize potential impacts within the Wild and Scenic River corridor. Ground based equipment utilized in restoration activities will remain on existing road surfaces within the Wild and Scenic River corridor. No heavy equipment will be utilized off of roads and will avoid soil compaction, displacement, and puddling potentially caused by ground-based equipment. Placement of large woody material will be accomplished by cable yarding and aerial placement. Detrimental soil conditions would not be caused by restoration activity.*

MA-6d-15 100% of the existing streamside shade should be maintained.

*Restoration activity along the upper McKenzie River will influence streamside shade resulting in a 3.7% reduction in existing shade. Results using shade modeling (EPA 1980, Brown's Model) yield a potential increase in stream temperature of 0.005°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 is 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 to the Trail Bridge-Kink Creek reach is designed to restore quantities of naturally occurring material to aid in recovery of ESA listed spring chinook and bull trout. Restoration activity will use native materials and will mimic existing structure in seeking natural appearance. No large woody material with cut ends will be used in the restoration reach, nor will attachments such as cable be*

*used. The placement of restoration wood will not impede or inhibit stream flow, and the material will function as natural in-stream material once placed.*

Protection and enhancement of ORVs and special attributes (Scenic, Recreation, Geologic and Hydrologic, Water Quality, Fish and free-flowing condition) is a management goal for the Upper McKenzie Wild and Scenic 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 some benefit to riparian dependent wildlife. Native vegetation will provide substantial vegetative screening due to the high density of evergreen and deciduous vegetation along the restoration reach. Although reduction of stream adjacent shade will occur along the restoration reach, the magnitude of effect is minimal with no influence on stream temperature. The aesthetic value of the Wild and Scenic River Corridor will be maintained by providing restoration material that is only 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 will be constructed within the Wild and Scenic River corridor. No alteration of McKenzie River flow will occur as a result of this project.

10) Section 7 Determination.

- a. The free-flowing condition of the Upper McKenzie River will be maintained with implementation of the proposed activity. Restoration to historic channel condition will maintain the natural flowing condition of the Wild and Scenic River. No adverse effects upon the free-flowing condition of the upper McKenzie Wild and Scenic River will occur with implementation of this project. No unreasonable diminishment of Scenic, Recreation, Geologic and Hydrologic, Water Quality, or Fisheries values associated with project activities will occur within, above or below the restoration area.

EFFECTS UPON STUDY RIVER OUTSTANDINGLY REMARKABLE VALUES

	Scenic	Recreation	Geologic/ Hydrologic	Water Quality	Fish
No Action	No Effect	No Effect	No Effect	No Effect	No Effect
Action	No Effect	Short Term Interruption (4-5 day trail closure)	No Effect	No Effect	Potential Short Term Disturbance, Long Term Benefit

- b. Findings on effects of the proposed project upon ORV's of the upper McKenzie River:

1. Scenic values. The scenic qualities of the Upper McKenzie River are seen from McKenzie River National Scenic Trail, campsites, forest roads, and from Highway 126, a segment of designated National Scenic Byway. This particular river segment is primarily viewed from the McKenzie River National Recreation Trail. The view is not continuous as the trail, which is located on the west side of the river, varies from stream bank to completely screened locations well away from the river.

The aesthetic value of the Wild and Scenic River corridor will be maintained by providing restoration material that is only natural in appearance. No form of attachment or cabling will be utilized to stabilize the large woody material. With intact root masses and/or no cut surfaces present on restoration materials, the scenic values within the corridor will be maintained.

Native vegetation will provide substantial vegetative screening due to the high density of evergreen and deciduous vegetation along the restoration reach. The majority of restoration material (66%) will be imported from outside the Wild and Scenic corridor. Woody material accumulations will be designed to mimic existing accumulations in the Upper McKenzie River corridor. Storage of wood prior to placement will be on Smith Ridge, a location that will be out of sight of recreational Wild and Scenic corridor users.

There will be a brief period of time when the newly added large wood will have the appearance of a recent disturbance event. With the attached root masses they will closely mimic natural disturbance events (blow down) that regularly occur within the Wild and Scenic River corridor.

The project will not adversely impact the ORV of scenery beyond the brief transitory period described above.

2. Recreation. Recreationists seeking 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 the McKenzie River National Scenic Trail. There is no known "on-river" recreation use such as rafting or kayaking occurring at this time in this segment. Boating use of the Upper McKenzie River begins at Olallie Campground which lies downstream of the project area. The lack of on-river recreational use within the project area is due to the difficulty of river access naturally occurring obstacles. Boating guidebooks for the McKenzie River list Olallie Campground as the uppermost access point to the river.

Restoration is also expected to enhance 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 increases in fish and aquatic insect production. As a result, restoration 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 will occur with project activity during 4-5 days of tree-lining and aerial placement of restoration material. Nearby trails, roads and dispersed campsites will be closed temporarily for the protection of public safety. Opportunity for interpretation of project objectives may be available to fisheries biologists/hydrologists working at the project site. Restoration effort will not have direct or adverse effects upon recreational values of the Wild and Scenic Upper McKenzie River.

3. Geologic/Hydrologic. Periodic changes in channel condition following restoration material placement and migration will result in variations of channel characteristics such as thalweg position, pocket pool position and frequency, off-channel habitat, and gravel recruitment and retention. Post-restoration changes in channel condition are expected to closely approximate a properly functioning Rosgen Type B channel, with adequate quantities of large woody material. Supplementation of gravel in the restoration reach will be used to compensate for the absence of migrating substrate from upper McKenzie reaches, only if sufficient material is not recruited. Placement of up to 120 cubic yards of 1-3 inch gravel over the one-mile long reach will not alter hydrologic function or the free-flow character of the river. There will be no adverse effects upon Hydrologic/Geologic resources as a result of this project.

4. Water Quality. With restoration portions of the project, 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 will result in a reduction of 3.7% 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 3.7% 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 0.005° Fahrenheit, essentially an immeasurable

difference between pre-project and post-treatment condition. No adverse effects to water quality are expected to result from this project.

5. Fish. Benefits are expected from an increase in large woody material, such as increases in spawning and rearing habitat, and improved function of floodplain and adjacent riparian areas of Upper McKenzie River. Project design seeks to minimize migration of restoration material with use of large sized material with root-mass intact. The in-stream work period of mid-July to mid-August will minimize potential impacts to at-risk species present in treatment reaches (timed to avoid adult spring chinook and adult bull trout presence). However, there is some potential to disturb juvenile spring chinook and bull trout with placement of woody material. Since a portion of the material will be fallen from the adjacent Riparian Reserve and the majority placed aurally, 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 not expected to adversely affect fish resources over the long term.

c. Other values:

Wildlife: Restoration material sources and material placement are factors that could affect wildlife resources in the Wild and Scenic River. Ground disturbance will be mitigated to insignificant levels from utilizing stream adjacent trees in restoration. No ground disturbance will occur as a result of helicopter placement activity. Placement of material by helicopter will meet wildlife operational period specifications. This project will not diminish wildlife resources.

Botanical: Identification of botanical resources was accomplished with 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 and described to the District Botanist. This project will not directly and adversely affect Botanical resources.

Prehistoric: Identification of sites of cultural or historic importance was accomplished with environmental analysis. Any impacts to prehistoric values will be avoided by this project through avoidance of identified sites. Sites potentially identified during project implementation will be avoided and described to the District Cultural Resource Specialist. This project will not directly and adversely affect Prehistoric resources.

References:

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