Evan's Slide Stabilization

Environmental Assessment and Finding of No Significant Impact

Environmental Assessment Number OR080-08-09

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Bureau of Land Management
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Marion County, Oregon

T. 8S, R. 4E, section 19, Willamette Meridian

Responsible Agency:	USDI - Bureau of Land Management
Responsible Official:	Cindy Enstrom, Field Manager Cascades Resource Area 1717 Fabry Road SE Salem, OR 97306 (503) 375-5969
For further information, contact:	Patrick Hawe, Project Leader Cascades Resource Area 1717 Fabry Road SE Salem, OR 97306 (503) 315-5974

BLM
Salem District

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BLM/OR/WA/AE-08/067+1792

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FINDING OF NO SIGNIFICANT IMPACT

Introduction

The Bureau of Land Management **(BLM)** has conducted an environmental analysis (EA# OR080-08-09) for the Evan's Slide Stabilization project.

We are proposing to initiate a number of related actions to reduce erosion and help reestablish channel stability in an unnamed tributary channel (**tributary**) of Evans Creek, located just west of the Evans Mountain Road (road # 8-4e-32). These actions would be employed over a period of a decade in order to assess the effectiveness of various erosion control techniques and interventions for achieving "desired future conditions."

Actions taken would include: placing trees, with root wads attached, into the tributary stream channel from the mouth to the headwaters. Sediment and colluvium in the headwaters of this channel and the surface of a rotational slump adjacent to the tributary will be stabilized by the addition of "wood straw" and a weed-free seed mix. Finally, large woody debris **(LWD)** will be placed into the Evan's Creek main channel to function as fish habitat enhancement and to help retain and store sediment in transit through the channel.

The project is located on BLM lands within Township 8 South, Ranges 4 East, Willamette Meridian (EA Section 1.1) from approximately 20-60 miles East of Salem, Oregon.

The Evan's Slide Stabilization Environmental Assessment (**EA**) documents the environmental analysis of the proposed project. The EA is attached to and incorporated by reference in this Finding of No Significant Impact determination (**FONSI**). The analysis in this EA supplements analyses found in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement*, September 1994 (**RMP/FEIS**). This project has been designed to conform to the *Salem District Record of Decision and Resource Management Plan***,** May 1995 (**RMP**) and related documents which direct and provide the legal framework for these projects (EA Section 1.3).

The EA and FONSI will be made available for public review June 25, 2008 to July 11, 2008**.** The notice for public comment will be published in a legal notice by the *Stayton Mail,* newspaper. Comments received by the Cascades Resource Area of the Salem District Office, 1717 Fabry Road SE, Salem, Oregon 97306, on or before July 11, 2008, will be considered in making the final decisions for this project.

Finding of No Significant Impact

Based upon review of the Evan's Slide Stabilization EA and supporting documents, I have determined that the proposed project is not a major federal action and would not significantly affect the quality of the human environment, individually or cumulatively with other actions in the general area. No environmental effects meet the definition of significance in context or intensity as defined in 40 CFR 1508.27.

There are no significant impacts not already adequately analyzed, or no significant impacts beyond those already analyzed, in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement*, September 1994 (RMP/FEIS) to which this environmental assessment is tiered. Therefore, supplemental or additional information to the analysis in the RMP/FEIS in the form of a new environmental impact statement (**EIS**) is not needed. This finding is based on the following discussion:

Context: Potential effects resulting from the implementation of the proposed project have been analyzed within the context of the project area boundaries. The proposed project would occur on BLM lands within Township 8 South, Ranges 4 East, Willamette Meridian (EA Section 1.1) [40 CFR 1508.27(a)] (EA section 1.1).

Intensity:

1. The proposed project is unlikely to a have significant adverse impacts on the affected elements of the environment (public safety, T&E fish species, other fish species, essential fish habitat, soils, water quality and channel function) [40 CFR 1508.27(b) (1)] for the following reasons:
    - Project design features described in EA section 2.2.1 would reduce the risk of effects to affected resources to be within RMP standards and guidelines and to be within the effects described in the RMP/EIS. As a result of implementing these design features, any potential effects to the affected resources are anticipated to be site-specific and/or not measurable (i.e. undetectable over the watershed, downstream, and/or outside of the project area).
    - *Soils*: Eroded slopes would be set on a trajectory towards revegetation as the surface was stabilized and planted. Soils disturbed by tree removal would be tilled and reseeded.
    - *Public Health*: The potential for the material placed in this proposal to contribute cumulatively to increased flood risk is low. The size of a flood event required to mobilize large quantities of wood in Evans Creek and cause damage to downstream resources would be so large (on the order of a 100 year event such as the 1964 flood) that the material proposed to be added by this project is inconsequential.
    - *Stream Channels*: The treatment would rehabilitate more natural sediment supply and transport patterns. Sediment delivery to streams and wetlands would be reduced. Native riparian vegetation would be promoted.
    - *Water Quality*: Although some soil surfaces and adjacent vegetation would be disturbed, runoff and sedimentation would be reduced over the long term by increased retention of unstable soil in the headwaters of the project area. Over the short term (< 1 week) some additional turbidity may result at the project site during implementation. Turbidity is not likely to be visible more than 1,000 feet downstream from activity. Project design features would reduce the risk of effects to water quality. (EA section 3.3.6)
    - *Fish species and essential habitat*: The proposed action would decrease the volume of sediment transported downstream to habitats used by T & E and other species (Upper Willamette spring chinook, Upper Willamette steelhead, resident cutthroat trout) in the short term by trapping sediments in the headwater stream channel. Long term effects to aquatic species would be an increase in the complexity of habitats when the wood moves out of the headwater areas and into lower gradient reaches utilized by them (EA section 3.3.2-3.3.4).

2. The proposed project would not affect:
   - Unique characteristics of the geographic area [40 CFR 1508.27(b)(3)] - Known historic or cultural resource sites, parklands, prime farmlands, wild and scenic rivers (designated or eligible), wilderness, or ecologically critical areas located within the project area will not be treated under this proposal (EA section 3.1, Table 2);
   - Districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, nor would the proposed projects cause loss or destruction of significant scientific, cultural, or historical resources [40 CFR 1508.27(b)(8)] (EA section 3.1, Table 2).

3. The proposed project is not unique or unusual. The BLM has experience implementing soil and slope rehabilitation projects without highly controversial effects [40 CFR 1508.27(b) (4)], highly uncertain, or unique or unknown risks [40 CFR 1508.27(b) (5)] (EA section 3.0).

4. The proposed project does not set a precedent for future actions that may have significant effects, nor does it represent a decision in principle about a future consideration [40 CFR 1508.27(b)(6)]. No hazardous materials or solid waste would be created in the project area. There would be no reduction in the amount of late-successional forest habitat on federal forestlands (RMP p. 22) (EA section 3.0). The proposed project would not retard or prevent the attainment of the ACS objectives (EA section 3.4).

5. The interdisciplinary team evaluated the proposed project in context of past, present and reasonably foreseeable actions [40 CFR 1508.27(b) (7)]. The proposed project does not contribute to cumulative effects to the resources evaluated (EA section 3.0).

6. The proposed project is not expected to have significant effects to Endangered or Threatened Species or habitat under the Endangered Species Act (ESA) of 1973 [40 CFR 1508.27(b) (9)].
   - Wildlife: There are no known federally listed species with in the project area. The project should have no effect on northern spotted owls due to timing, and location. The closest known site is over three miles away, and the project will maintain the current dispersal habitat. The project will occur outside of critical breeding season.
   - Fish: Determinations have been made that the project may affect, but is not likely to adversely affect Upper Willamette River (UWR) steelhead trout or UWR chinook salmon. Consultation with NOAA Fisheries will be conducted under the Aquatic Restoration Biological Opinion, dated April 28, 2007.

7. The proposed project does not violate any known Federal, State, or local law or requirement imposed for the protection of the environment [40 CFR 1508.27(b) (10)]. The alternatives are consistent with other Federal agency and State of Oregon land use plans and with County land use plans and zoning ordinances. Any permit requirements associated with the implementation of this project would be obtained and complied with. Project design features would assure that potential impacts to water quality would be in compliance with the State of Oregon In-stream Water Quality Standards and thus the Clean Water Act (EA section 3.3.6). Additionally, the proposed projects are consistent with applicable land management plans, policies, and programs (EA section 1.3).

Prepared by: Patrick Hawe
Patrick Hawe, Hydrologist
6/25/08
Date

Reviewed by: Carolyn Sands
Carolyn Sands, NEPA Coordinator
6/25/08
Date

Approved by: Cindy Enstrom
Cindy Enstrom, Field Manager
Cascades Resource Area
6/25/08
Date

ENVIRONMENTAL ASSESSMENT

1.0 INTRODUCTION

This environmental assessment discloses the predicted environmental effects of a proposal to reduce erosion and help reestablish channel stability in an unnamed tributary channel of Evans Creek, located just west of the Evans Mountain Road (road # 8-4e-32) located in section 19 of T 8S, R 4E. The project would take place on BLM lands within the Little North Fork Santiam 5th field Watershed approximately thirteen miles northeast of the City of Lyons, Oregon (see Map 1 and Figure 1).

1.1 Summary of the Proposed Project

Actions that would be taken include: 1/ placing large wood, trees with root wads attached and other organic materials into the tributary channel; 2/ stabilizing soils in the headwaters of the tributary channel and on the surface of the rotational slump adjacent to the tributary by the application of erosion control methods; 3/ cutting small trees (< 16 inches dbh, hardwood species only) and brush adjacent to the channel and along the banks or on channel bars of the mainstem of Evan's downstream from the project area to release understory conifer; 4/ placing these small red alder trees in the channel to add fine material for filtering and trapping suspended sediment; 5/ Planting of native tree and shrub species appropriate to the location may be utilized to speed development of the vegetative under-story and to restore a mature forest community.

These actions would be employed over a period of a decade in order to assess the effectiveness of various erosion control techniques and interventions for achieving "desired future conditions." See purpose and need for action (EA section 1.2)

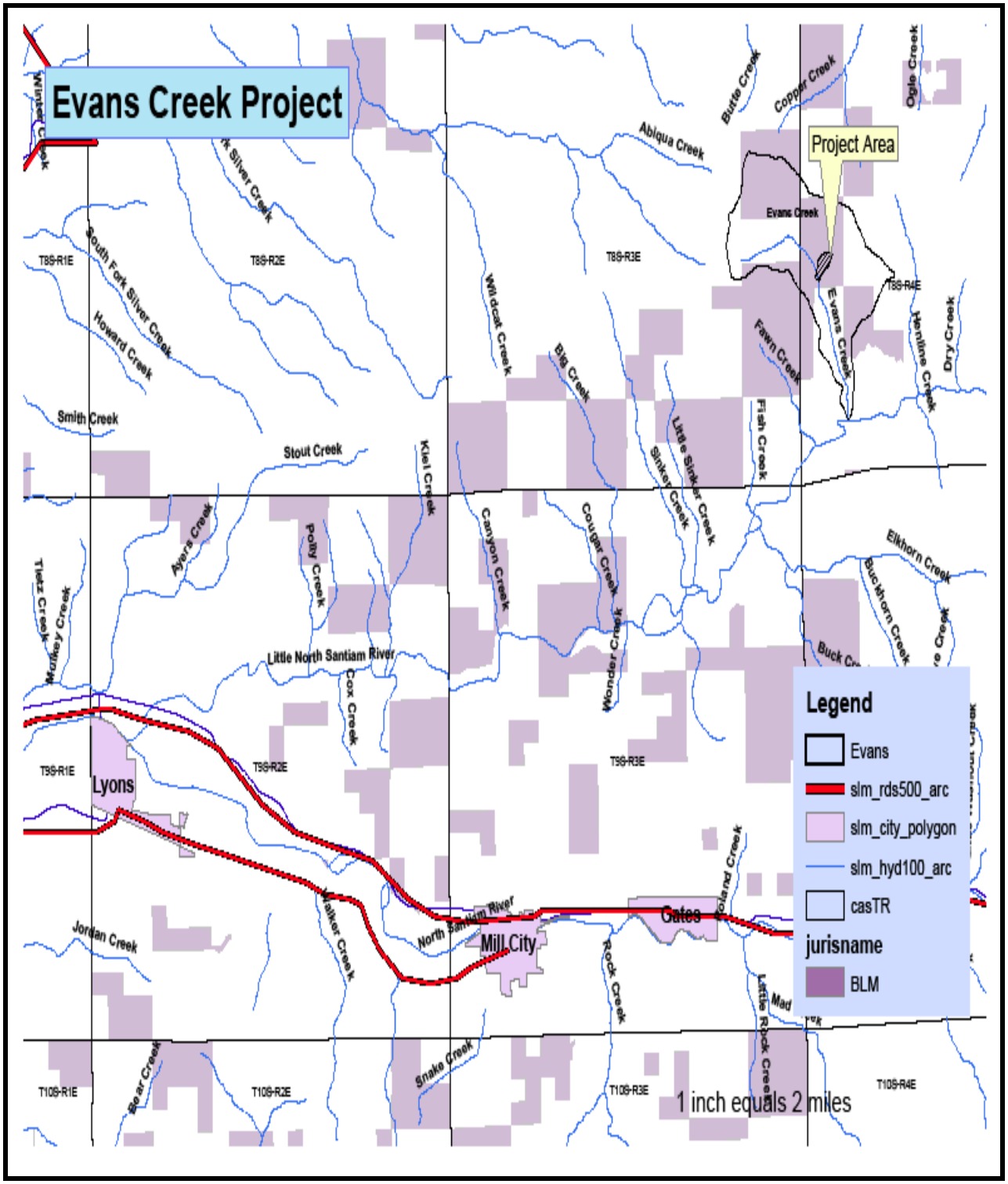
1.2 Purpose of and Need for Action

Unusually high turbidity peaks (over 1,000 NTUs) were noted at the Niagara gage in the Little North Santiam River in late 2006 associated with large November storm events. Around this time highly turbid water from Evans Creek entering the Little North Santiam River was also noted by a local landowner and reported to U.S. Geologic Survey (USGS) in Portland, Oregon. After further review by the USGS, BLM was contacted and asked to investigate the land-sliding and, if possible, to propose a project to correct this problem.

Investigations of Evans Creek in 2007 by BLM centered on a deep seated rotation slump and a debris slide below the Evans Mountain Road (#8-4e-32)[1]. Unless some action is taken to slow the rate of this process, failures will continue and persistent high turbidity will be observed downstream.

[1] Source incorporated by reference: Hawe, Patrick. Evans Creek Slide Site Description. 2007. Internal unpublished report. Salem District Bureau of Land Management.

Map 1: Vicinity Map



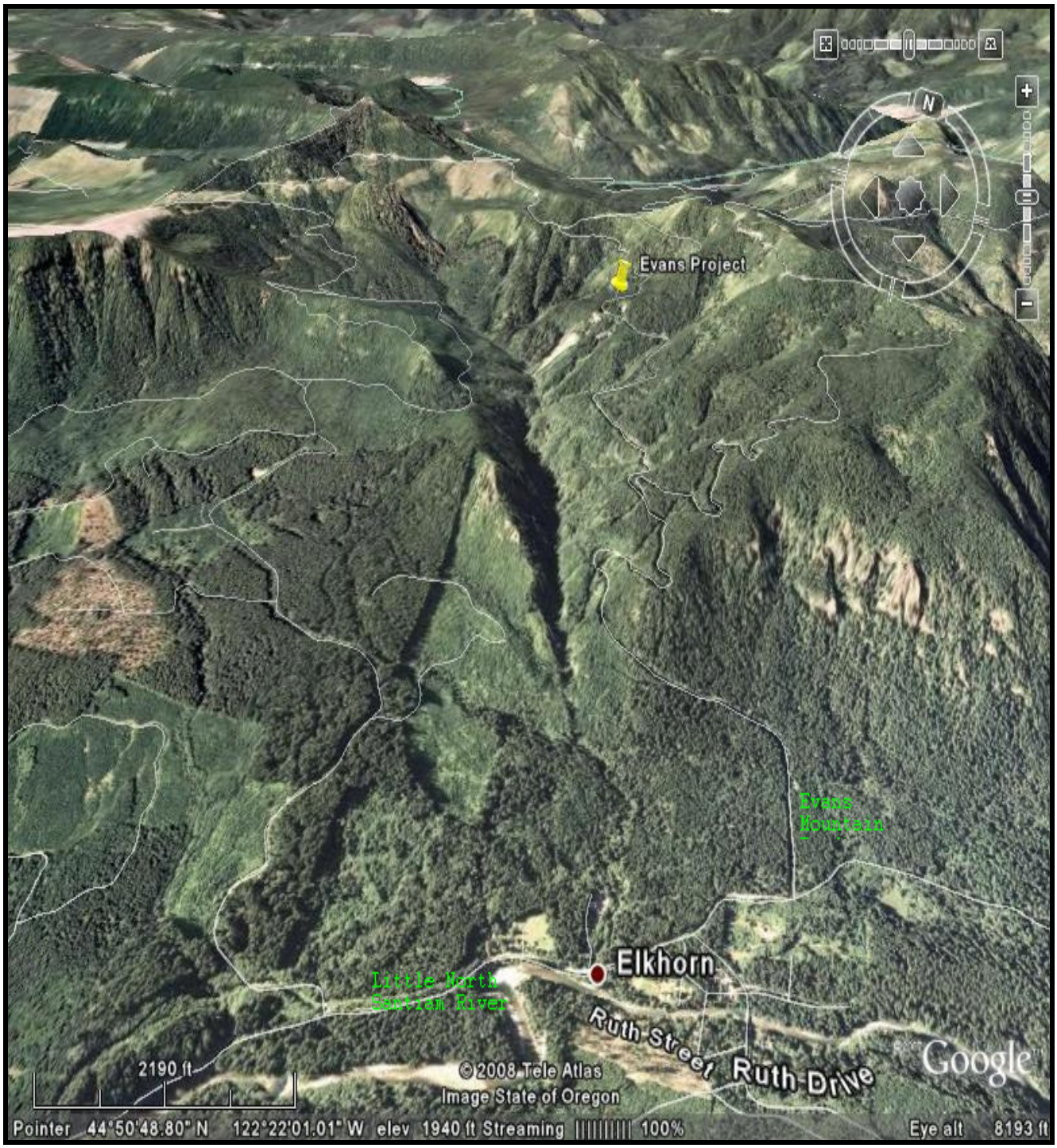


Figure 1: Evans Slide Project Area

The unstable area consists of two parts; a large (approximately 10 acre) deep-seated rotational slump feature and a tributary channel that initiates in the slump's headwaters. Field review of the site indicated that the majority of the fine sediment that supplied the high turbidity plumes at the mouth of Evans Creek likely originated in the project area and that the tributary channel was scoured to bedrock by a debris torrent sometime in the winter of 2006/07.

Based on field review and GIS measurements we estimated that approximately one acre of unstable soil and loosely consolidated sediment remains at the top of the tributary channel. A conservative estimate is that an additional 25,000 cubic-yards (2,500 truckloads) remains in a vulnerable position and will continue to fail, primarily during major storm events under saturated conditions. Failures of this material with subsequent turbidity spikes downstream have been observed as recently as May of 2008. In addition, there is a massive lobe of soil and rock behind the material currently failing. As the front edge of the failing material drops into the creek and is scoured away, material behind it moves in to position to fail in a conveyor belt fashion.

Investigations also noted that few large trees, stumps or wood were in the channel. This material was evidently removed from the channel by an earlier landslide event around 1980 and subsequent debris torrents have washed out most of the organic material that has collected in the meantime. Thus, recruitment of additional woody material from the relatively young forest adjacent to the slide has not been adequate to maintain organic material in the channel: only a single large root wad attached to a tree bole was noted during the survey. Trapped behind the root wad and tree were several cubic yards of sediment in storage.

We hypothesize that increasing channel roughness, by adding organic material such as trees with root wads attached as well as smaller trees and limbs with leafy material, would help provide the structure needed to trap and retain sediment in the tributary channel. Placing trees at the base of the soil mass and the application of surface erosion control measures might be effective at reducing erosion of fine sediment and thereby reduce turbidity downstream. Overtime, retention of these materials may help to slow the rate of mass soil movement and failure. Establishment of trees and brushy species in the debris chute would provide additional support and filtration.

The objective of this project is to achieve the following Desired Future Conditions:

- The desired future condition of the unnamed tributary is the recovery of a mature vegetative community along the channel bed and in the adjacent riparian area which provides for the maintenance of stable banks, recruitment of large wood and the effective storage of sediment and colluvium in channel. In addition, stabilization of the unstable soil mass in the headwaters of the tributary is desirable. If full stabilization is not achievable, the reduction of the rate of failure of the soil mass is desirable.

- The desired future condition for the Little North Fork Santiam, including Evans Creek and its tributaries, includes a complex aquatic system, capable of fulfilling the habitat needs of aquatic species that may colonize the river, including anadromous fish species, and a supply of water for the City of Salem with turbidity levels and fine sediment transport in balance with the natural background supplies.

1.2.1 Decision Criteria/Project Objectives

The Cascades Resource Area Field Manager will use the following criteria/objectives in selecting the alternative to be implemented. The field manager would select the alternative that would best meet these criteria. The selected action would:

- Meet the purpose and need of the project (EA section 1.2);
- Comply with the *Salem District Record of Decision and Resource Management Plan*, May 1995 (RMP) and related documents which direct and provide the legal framework for management of federal lands within the project area (EA section 1.3);
- Not have significant impacts on the affected elements of the environment beyond those already anticipated and addressed in the RMP/EIS and the LRMP/EIS;
- In the tributary channel (approximately 1,500 feet), actions would help achieve desirable future conditions as noted in the purpose and need;
- In the reaches downstream of the tributary channel and landslide, improve water quality by reducing the supply of fine sediment, increase the habitat complexity, and improving the habitat quality for fish species that are resident;
- Not increase the risks to public safety and infrastructure from flooding and landsliding;
- Minimize surface erosion and revegetate eroding surfaces; and
- Not contribute to the expansion of invasive/nonnative weed populations.

1.3 Conformance with Land Use Plan, Statutes, Regulations, and other Plans

The proposed activities have been designed to conform to the following documents, which direct and provide the legal framework for management of BLM lands within the Salem District:

1. *Salem District Record of Decision and Resource & Management Plan* (RMP), dated May 1995 The RMP has been reviewed and it has been determined that the proposed activities conform to the land use plan terms and conditions (e.g. complies with management goals, objectives, direction, standards and guidelines) as required by 43 CFR 1610.5 (BLM Handbook H1790-1).
2. *Little North Santiam Watershed Analysis,* dated 1997;
3. *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* and *Standard and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl*, dated April, 1994; and the
4. *Record of Decision To Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Bureau of Land Management Resource Management Plans Within the Range of the Northern Spotted Owl*, dated July 2007.

The analysis in this EA is site-specific and supplements analyses found in the *Salem District Proposed Resource Management Plan/Final Environmental Impact Statement*, September 1994 (RMP/FEIS). The RMP/FEIS includes the analysis from the *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*, February 1994 (NWFP/FSEIS).

The above documents are incorporated by reference and are available at the Salem District Office.

1.4 Results of Scoping

A scoping letter was sent on February 22, 2008 to federal, state and municipal government agencies and interested parties on the Cascades Resource Area mailing list. The letter briefly described the project and included a map of the project area. In addition, a public presentation of the project was given to the North Santiam Watershed Council on February 14, 2008 in Stayton, Oregon. Six scoping comment letters were received. Table 1 shows the concerns that were raised in scoping and where they were addressed in this document.

Table 1: Concerns that were raised in Scoping

Concern	***Addressed in EA section***
Request of Cabling structures in place on steep slopes	5.3 - Public Scoping and Notification
Expense of using a helicopter	5.3 - Public Scoping and Notification
Flood Potential	3.3.1 - Public Safety
Water Quality and Water Resource concerns such as	3.3.6 - Channel Function and Water Quality
Changing water levels	5.3 - Public Scoping and Notification
Change in turbidity	3.3.6 - Channel Function and Water Quality
Change in underground water quality (wells)	5.3 - Public Scoping and Notification
Altering access banks that would impact safe use for disabled clients.	5.3 - Public Scoping and Notification

2.0 ALTERNATIVES

2.1 Alternative Development

Pursuant to Section 102 (2) (E) of the National Environmental Policy Act (NEPA) of 1969, as amended, Federal agencies shall "…study, develop, and describe appropriate alternatives to recommended courses of action in any proposal which involves unresolved conflicts concerning alternative uses of available resources."

No unresolved conflicts concerning alternative uses of available resources (section 102(2) (E) of NEPA) were identified. No alternatives were identified that would meet the purpose and need of the project and have meaningful differences in environmental effects from the Proposed Action. Therefore, this EA will analyze the effects of the "Proposed Action" and the "No Action Alternative".

2.2 Proposed Action

The BLM, in partnership with North Santiam Watershed Council, proposes to place up to 40 trees with root wads attached by helicopter in an unnamed tributary to Evans Creek. Trees would range from 18 to 30 inches in diameter at breast height (dbh) and from 40 to 100 feet in length, and would be placed at up to 20-40 sites from the mouth to the headwaters (approximately 1,500 feet) at the base of an unstable soil mass (approximately 25,000 cubic-yards).

Most of the trees would be placed in configurations of 2–3 per site, some trees would also be placed individually. As many as possible of the trees would have intact rootwads, and lengths would be kept as long as possible. The trees would create debris jams and woody complexes, and serve as traps for bedload materials, woody debris and nutrients.

In channel placement sites would be selected that have existing structural and/or geomorphic features determined most likely to retain the placed wood. Pieces would not be artificially secured to the bed or banks of the stream, but would be allowed to interact naturally with the stream system. Approximately 310 cubic yards of wood is expected to be placed initially in the channel.

Trees, logs and wood used for the project would be obtained from BLM lands adjacent to the project site. Trees would be pushed down with an excavator in order to keep the rootwads attached, then flown directly to the LWD placement sites. Trees would be selected in a manner that would not downgrade the suitability of the stand as habitat for the Northern spotted owl. Additional trees that have been knocked over during wind storms and that lay within a short distance of the project area may be utilized if and when they become available. Trees or logs trucked to the project area would be decked along BLM roads in Section 19, prior to transport by helicopter.

Soils in the headwaters of the tributary channel and on the surface of the rotational slump adjacent to the tributary would be stabilized by the application of erosion control methods such as the addition of "wood straw" and a weed-free seed mix or the placement of straw bales, straw blankets and silt fencing or the use of an assortment of other types of soil bioengineering methods[2] and biodegradable erosion control methods. Sources for the wood, organic materials and erosion control products would be from public forest in the vicinity of the channel and/or from private vendors.

One type of surface erosion control method that would be utilized is the application of "Wood straw," a weed free lumber product, applied to bare surfaces on both the rotational slump and the sediment in the headwaters of the tributary channel by helicopter and/or by hand. This material has been used successfully to control erosion on post-burn sites throughout the west. Erosion control materials would be supplemented with the application of weed free grass seed.

[2] Examples of soil bioengineering methods and BMPs that may be applied are available at http://www.portlandonline.com/shared/cfm/image.cfm?id=94539

Small trees (<16 inches dbh) and brush adjacent to the tributary channel and the main channel would be cut and placed in the channel to help filter and trap suspended sediment in transport. Conifer tree species (primarily Western Red Cedar and Douglas fir) on stream banks and bars adjacent to the main channel and the tributary channel would be "released": deciduous species that over-top them and block solar radiation would be selectively cut and placed in the channel to help filter sediment.

Project implementation would take place between July 2008 and October 1, 2018, depending on the availability of materials and budget. Some actions may be repeated, as deemed necessary, depending on the efficacy of the action as determined by monitoring.

All actions would utilize Best Management Practices as outlined in the section on Project Design Features. Use of mechanized equipment in the tree source area would be limited to the road right-of way when safe and practical. Soil compaction would be limited by allowing no more than one pass with the excavator along any individual route outside of the road right-of-way and any compacted areas would be sub-soiled by the excavator upon completion of tree removal.

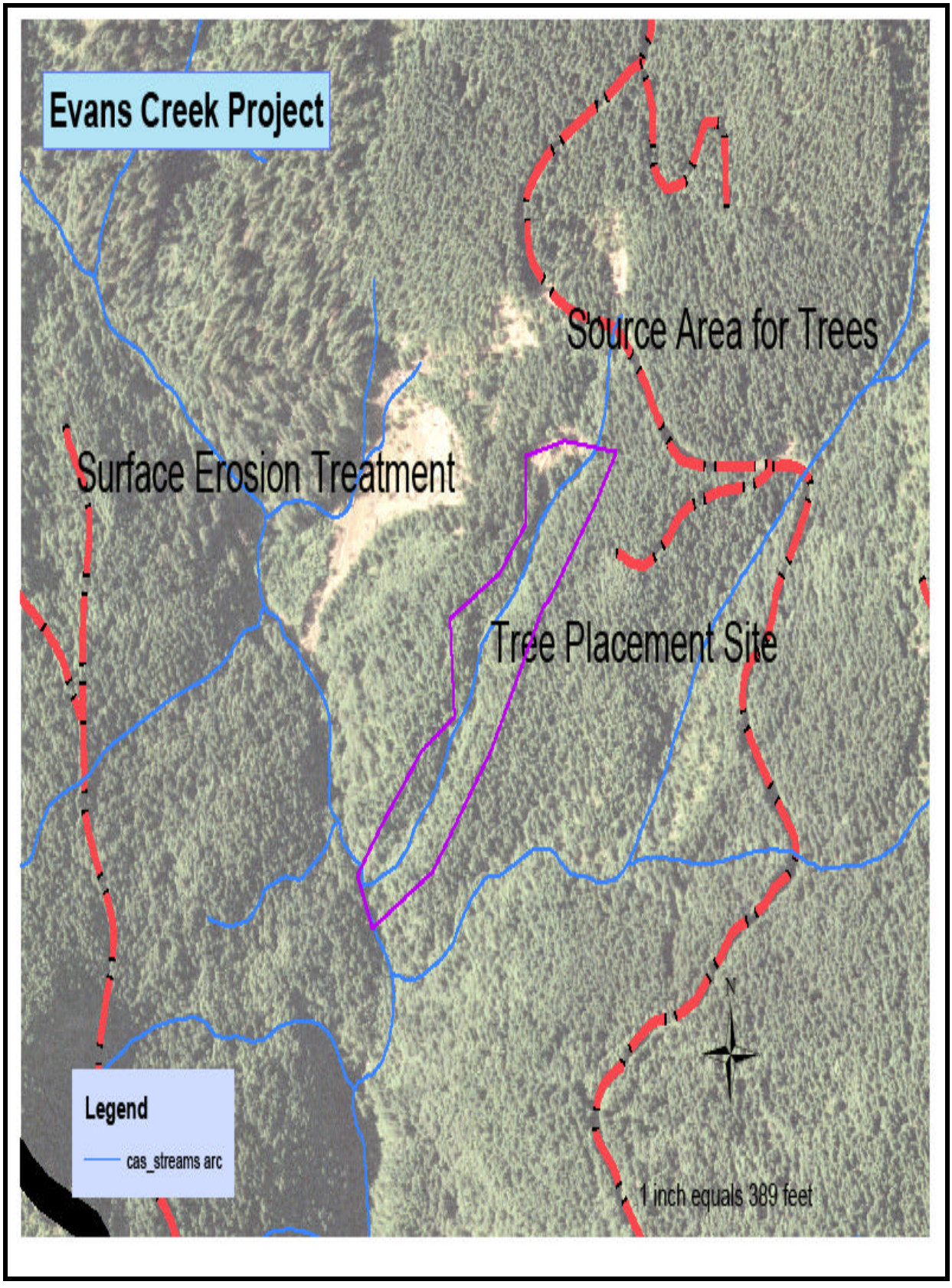
Helicopter activities would create considerable noise disturbance and therefore, implementation of the project would occur outside of the Northern spotted owl nesting season. In-stream project activities outside of the in-stream work window (July 15-August 31) would only occur with the approval of the Oregon Department of Fish and Wildlife.

2.2.1 Project Design Features

The following is a summary of the design features that reduce the risk of effects to the affected elements of the environment described in Section 3.1.

- In the tree removal area, limit excavator travel to road right-of-ways when safe and practical. When travel is necessary on surfaces beyond the road right-of-way, limit excavator travel to a single pass and keep treads on top of organic material and slash as much as practical to avoid disturbing the mineral soil. The excavator operator will till compacted soil surfaces before leaving the forest.
- Do not operate the excavator on soils when they are saturated; limit turning and rocking of the excavator as much as practical to avoid displacing and gouging the mineral soil.
- Limit breakage and disturbance of standing dead and downed trees and logs as much as practical.
- During wood placement, limit breakage of trees and branches in the riparian zone as much as practical.
- Locate Helicopter service landings at least 500 feet from any water body. Refuel all power equipment outside of riparian reserves.
- Locate log (LWD) deck site on flat ground away from water.

Project Map


Evans Creek Project
Source Area for Trees
Surface Erosion Treatment
Tree Placement Site
Legend
cas_streams arc
N
1 inch equals 389 feet

- All earth moving and logging equipment would be cleaned and free of soil and plant parts before entering BLM lands to prevent the introduction of invasive/nonnative species. Areas of disturbed soil that are a result of the proposed project would be seeded to abate the establishment of these species. Oregon Certified blue wild rye (*Elymus glaucus*) or other approved native seed from the Cascade eco-region of Oregon would be used where seeding takes place.

2.3 No Action Alternative

Under the No Action Alternative no tree placement or erosion control activities would occur in the unnamed tributary of Evans Creek. Retention in the channel of the sediment stored in the headwaters and on the surface of the rotational slump and debris slide would be dependent on the existing structural elements in the channel.

Existing large wood loading and the supply and transport of fine sediments in Evans Creek and the Little North Fork Santiam would remain at current levels. Reductions in turbidity and improvement in instream habitat quality for anadromous salmonid fishes would take place slowly as trees and large wood builds up in the channel headwaters.

Sediment inputs from the landslide features would continue unabated and could worsen if the rate of failure of the soil mass in the headwaters accelerates.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

3.1 Environmental Review of the Elements of the Environment

Table 2 shows the environmental review of elements of the environment, required by law, regulation, Executive Order and policy that could be affected by the proposed action. Unless otherwise noted, the effects apply to the proposed action; and the No Action Alternative is not expected to have adverse effects to these elements. Affected elements are **bold**. All entries apply to the action alternatives, unless otherwise noted.

Table 2: Environmental Review for the Elements of the Environment Required by Management Direction

Elements Of The Environment	***Status: (i.e., Not Present , Not Affected, or Affected)***	***Does this project contribute to cumulative effects? Yes/No***	***Remarks***
Air Quality (Clean Air Act)	Not Affected	No	No aspects of the project would alter air quality to an extent greater than would the exhaust of diesel powered heavy equipment.
Areas of Critical Environmental Concern	Not Present	No	No areas of critical environmental concern are in the project area.

Elements Of The Environment		*Status: (i.e., Not Present , Not Affected, or Affected)*	*Does this project contribute to cumulative effects? Yes/No*	*Remarks*
Cultural Resources		Not Present	No	No cultural resources are known to be present in the proposed project areas. Inventory will be completed prior to project implementation.
Adverse Impacts on the National Energy Policy (Executive Order 13212)		Not Present	No	There are no known energy resources located in the project area. The Proposed Action will have no effect on energy development, production, supply and/or distribution.
Environmental Justice (Executive Order 12898)		Not Present	No	The Proposed Action is not anticipated to have disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.
Prime or Unique Farm Lands		Not Present	No	The project area is located in a forested mountainous setting w/o any farmland
Flood Plains (Executive Order 11988)		Not Present	No	The project is small in scale and located in a steep headwater stream w/o floodplains. The project is unlikely to change the character of the river floodplain, change floodplain elevations, or affect overbank flooding.
Hazardous or Solid Wastes		Not Present	No	There are no known hazardous or solid wastes located in the project area. The proposed action will have no effect on hazardous or solid waste production, supply and/or distribution.
Invasive, Nonnative Species (plants) (Executive Order 13112)		Not Affected	No	A Noxious Weed Risk Assessment of the project area was conducted and the area was found to have a risk assessment rating of moderate. A moderate rating indicates the proposed project should proceed as planned with measures in place to control and/or prevent the establishment of invasive/non-native plant species in areas of ground disturbance.
Native American Religious Concerns		Not Present	No	No Native American religious concerns were identified during the public scoping period.
Threatened or Endangered (T/E) Species and Critical Habitat	**Fish**	**Affected**	**No**	**Addressed in text (Section 3.3.2)**
	Plants	Not Present	No	No T&E species or habitat are known or suspected to exist in the project area.
	Wildlife (including designated Critical Habitat)	Species: Not Present Habitat: Not Affected	No	There are no known federally listed species with in the project area. The project should have no effect on northern spotted owls due to timing, and location. The closest known site is over three miles away, and the project will maintain the current dispersal habitat. The project will occur outside of critical breeding season.
Water Quality (Surface and Ground)		**Affected**	**No**	**Addressed in text (Section 3.3.6)**
Wetlands (Executive Order 11990)		Not Present	No	
Wild and Scenic Rivers		Not Present	No	
Wilderness		Not Present	No	
Essential Fish Habitat (Magunuson-Stevens Act)		**Affected**	**No**	**Addressed in text (Section 3.3.4)**

Elements Of The Environment		*Status: (i.e., Not Present , Not Affected, or Affected)*	*Does this project contribute to cumulative effects? Yes/No*	*Remarks*
Late Successional and Old Growth Habitat		Not Present	No	No late successional or old growth habitat is located in the project area.
Other Special Status Species / Habitat	Plants	Not Present	No	No Special Status Species are known or suspected to exist in the project area.
	Wildlife	Not affected	No	There are no known special status species within the proposed project area. Oregon slender salamander could be present within the proposed project area. The expected impacts of the project on Oregon slender salamander should be minimal due to timing, location and mitigating measures. The tree pushing is timed for the summer in which the Oregon slender salamanders are not as active. Location of the project will occur in a younger forest, not optimal habitat. Mitigating measures of the project will include avoiding disturbance of large woody material on the ground with mechanized equipment.
	Other Fish Species	**Affected**	**No**	**Addressed in text (Section 3.3.3)**
Public health or safety [40 CFR 1508.27(b)(2)]		Not Affected	No	Addressed in text (Section 3.3.1)

The following elements of the environment from Table 1 which may be affected by this project were reviewed: **Threatened and endangered fish species, other fish species with special status, essential fish habitat, and channel function and water quality**. *Sections 3.2-3.4* describe the current conditions and trends of those affected elements, and the environmental effects of the alternatives on those elements.

3.2 Affected Environment / Existing Watershed Condition

The project is located within the Little North Santiam 5th field watershed (HUC#1709000505), approximately 14 miles northeast of Mehama, Oregon. The North Santiam River currently serves at the primary source of drinking water for the City of Salem and the Little North Fork Santiam is designated as a Tier 1 Key watershed.

3.2.1 Public Safety

Shallow, rapidly moving landslides may pose a public safety risk. The project area is known to be a naturally high landslide hazard. The tributary channel is likely to be subject to additional debris torrent type landslides which may transfer material and water in the channel to the main Evans Creek channel at its confluence and downstream.

Approximately 9,500 feet (1.8 miles) downstream of the confluence of the tributary channel and Evans Creek, the main channel passes through private property with structures. In addition, just above the confluence of Evans with the Little North Fork Santiam, the main channel passes under the North Fork county road. The crossing structure at this location is approximately five feet high from the bed of the stream channel to the base of the concrete culvert and is overtopped during large storm events (i.e., 1964 and 1996).

Environmental Effects to Threatened and Endanger Species are described in EA section 3.3.1.

3.2.2 Fish Species and Habitat

3.2.2.1 Threatened or Endangered Species and Habitat (including Critical and Essential Fish Habitat)

Threatened or Endangered Fish species found within the Little North Santiam watershed are Upper Willamette River (UWR) steelhead trout or UWR chinook salmon.

Historically, upstream migration of anadromous fish was blocked by Salmon Falls at RM 15.9. A fish ladder was installed at the falls in 1958. Steelhead are now suspected to migrate as far as a barrier falls at RM 23.9 near Jawbone Flats. Steelhead are found in approximately 26.9 miles of stream in the watershed. Most of the habitat is in the mainstem, although three tributaries (Sinker, Elkhorn, and Evans creeks) are known or suspected to support steelhead populations in the lower reaches. Communications with the landowner occupying the lower section of Evans creek indicate that although steelhead were commonly seen attempting to navigate the falls located approximately 500 feet up Evans creek from the Little N. Fk Santiam they have not seen any in recent years.

In the years following the opening of the fish ladder at Salmon Falls, chinook were commonly seen upstream of the falls. Currently, chinook are rarely found upstream of Salmon Falls although they are capable of ascending the fish ladder. Since the Little N. Fk Santiam River is potentially inhabited by chinook salmon, it is considered to be Essential Fish Habitat as designated by the Magnuson-Stevens Act.

Environmental Effects to Threatened and Endanger Species are described in EA section 3.3.3. Environmental Effects to Essential Fish Habitat are described in EA section 3.3.4.

3.2.2.2 Other Special Status Fish Species – Cutthroat Trout

Resident cutthroat trout are found throughout the Little North Santiam watershed, particularly upstream of anadromous barriers and are present in Evans creek

Environmental Effects to cutthroat trout are described in EA section 3.3.3.

3.2.2.3 Fish Habitat

Fish Species affected by this project have similar habitat requirements. They all require clean, cold water, and complex habitat.

Environmental Effects to fish habitat are described in EA sections 3.3.2-3.3.4.

3.2.3 Soils

Soils adjacent to Evans Creek formed primarily in the till and colluvium derived from the basalt and tuffs on the steep hillsides that constrain the river and its tributaries. In the source area for trees, the soil is mapped as a Whetstone stony loam, 25-55% gradient (mapping unit WHF). This is a shallow, well-drained soil and moderately productive for Douglas fir and other conifer trees.

Environmental Effects to cutthroat trout are described in EA section 3.3.5.

3.2.4 Channel Function and Water Quality

3.2.4.1 Channel Function

The tributary channel is located in the Oregon Western Cascades at elevations ranging from 2,000 – 3,000 feet within the transient snow zone (TSZ), an area subject to rain-on-snow events (ROS) that have the potential to increase peak flows during winter or spring storms. The project area receives approximately 60-80 inches of rain annually and has an approximate mean 2-year precipitation event of four inches in a 24-hour period (estimated from map at: http://www.wrcc.dri.edu/pcpnfreq/or2y24.gif).

Evans Creek is a fourth order perennial stream constrained by steep hillslopes formed in older Western Cascades volcanics. In general in the project area the stream is a Rosgen A1-3 stream-type: >4% gradient, bedrock/boulder/cobble substrate and moderately entrenched, although there are sections of lower and steeper grade. Channel gradient in the reach at the confluence with the treatment channel is 2.5%. Due to natural downstream barriers there are no current or historic uses by migratory species of the reach at the confluence with the treatment channel

Steelhead trout are know to utilize the Evans Creek main channel for spawning and rearing approximately 6,600 feet downstream from the project channel.

The unnamed tributary channel is a first order perennial stream constrained by steep hillslopes formed in older Western Cascades volcanics. In general, in the project area the stream is a Rosgen A1a+ stream-type: >10% gradient, bedrock channel deeply entrenched and prone to debris torrents. This is an unstable channel type, functioning below reference conditions due to low levels of large wood with poor recruitment potential from adjacent riparian stands. Due to the steep gradient and unstable condition of the channel it is unlikely to serve as habitat for native fish species.

Streamflow was observed late in the base flow period (September/October) and issues from a groundwater spring that surfaces at the base of the unstable soil weg in the channel's headwaters. Generally, channel substrate is an exposed fine grained volcanic bedrock with a veneer of colluvium (silty-clay, sands, gravel and cobble) eroded from the adjacent unstable sideslopes**.**

Environmental Effects to Channel Function are described in EA section 3.3.6.

3.2.4.2 Water Quality

The North Santiam River is the primary drinking water source for 155,000 residents of the Salem area. Several high-flow events beginning in 1996 have caused high persistent turbidity, resulting in approximately 5-10 closures of the Water Treatment Plant (WTP) intake for up to 48 hours per closure. The Salem WTP uses a slow-sand filtration process that is unable to treat water with turbidity levels greater than 10 NTU. A pretreatment facility was constructed in 1997 to handle high turbidity conditions. Its use requires a significant increase in operating costs.

The Oregon Department of Environmental Quality requires water suppliers to provide users with water having an average turbidity at or below 1 NTU, with no exceedance allowed over 5 NTU. An investigation by the United States Geologic Survey (USGS) (Major Turbidity Events in the North Santiam River Basin, Oregon, Water Years 1999–2004, http://pubs.usgs.gov/sir/2007/5178/) discusses the Evans Creek landslide:

For over a week, beginning on January 23, a series of storms passed over the North Santiam River basin, depositing more than 10 in. of rain (Oregon Climate Service, 2006).

- The highest flows were recorded at the Little North monitoring station at 12,700 ft3/s.
- The continuous rainfall mobilized sediment, increasing turbidity to 251 FNU at Little North monitoring station.
- High turbidity during this storm prompted the closure of the water-treatment facility (Hank Wujcik, City of Salem Public Works Department, written commun., 2005).
- During the 3-day storm period, the Little North Santiam River carried 11,394 tons of suspended-sediment, a yield of 102 tons/mi2 .
- This was the third highest event yield for the Little North Santiam subbasin during the study duration.
- Field investigations pointed to a landslide in the Evans Creek watershed, near the community of Elkhorn, as the source of turbidity to the Little North Santiam River during this event.
- Because of the proximity of the Little North Santiam River to the City of Salem water-treatment facility (about 10 mi upstream), turbid water emanating from the subbasin is a major concern.
- In late December 2005, turbidity in Evans Creek was, on average, more than 30 times greater than that in the Little North Santiam River at Elkhorn.
- Although Evans Creek may not be the only sediment source, it appears to be one of the uppermost subbasin sources.

Environmental Effects to Water Quality are described in EA section 3.3.6.

3.3 Environment Effects

3.3.1 Public Safety

Sources incorporated by reference: Evans Creek Slide Risk Assessment

3.3.1.1 Proposed Action

Over the long term (years to decades) much of the trees and wood placed in the tributary channel is likely to be moved downstream to the main Evans Creek channel. Hypothetically, this material could form debris dams in the main channel or add to existing debris dams. Catastrophic failure of a debris dam during a large storm event could result in scour and flooding downstream as the wave of water and material passed by. The potential for such an event to occur and its likely results were independently evaluated by Doug Shank, licensed geologist with the Willamette National Forest. Doug's summary report is excerpted below (the full report is available in the project file).

The Salem BLM proposes to place about 40 trees (with root wads attached) by helicopter into an unnamed tributary channel of Evans Creek. This channel begins in an actively unstable area of the Evans Creek Slide, an approximately 10 acre slump / earthflow complex. The potential for a failure off the slide mass to carry the large woody debris into Evans Creek is fairly high. This material is intended to provide stream structure and create small jams to entrap sediment. The potential for these structures to create a blockage and a surge that will move down stream to affect the downstream land owners is very low. A future storm and failure sequence of the magnitude of the 1964 event would uproot or dislodge so much material along the channel that the few logs added by the BLM would be inconsequential to such a mass.

The field evidence clearly indicates that lower Evans Creek has been prone to channel restrictions and flow movement out onto the terraces several times, including 1964, 1996, and likely even more recent flood events. It appears the primary cause for these flow disturbances has been slope and channel bank failures along the east side of Evans Creek beginning about one mile south of the BLM project site and extending down stream to almost directly across from the property of concern.

In addition, Mr. Shank included the following recommendations concerning this project:

A) This project is a good idea. We cannot stabilize the slide, but we can improve the sediment holding capability of Evans Creek at least a little. Natural existing small debris jams down stream of the slide and natural larger trees that have fallen into the channel are serving to catch sediment and slow flow. They are currently functioning in a similar manner as the planned log placement hopes to do. This project could help the down stream residents by slowing flow at least a little, and it may reduce turbidity to a degree and improve water quality.

B) The riparian area along the steep tributary stream should be thinned as part of this project. Both alder and conifer should be dropped into stream to create small check dams of fines and limbs against the larger woody debris that is added. This should be done in conjunction with larger wood placement. This thinning could be done in stages so that the input of limbs and needles was staggered over time and space - such as every other year on alternate sides of the stream. Thinning would have the added benefit of increasing the growth and vigor of the leave trees, in order to create larger future woody debris recruitment.

In conclusion, I recommend that this project move forward. The risk to the downstream land owners is very low.

3.3.1.2 Cumulative Effects

As noted in the geologist report, the potential for the material placed in this proposal to contribute cumulatively to increased flood risk is low. The size of a flood event required to mobilize large quantities of wood in Evans Creek and cause damage to downstream resources would be so large (on the order of a 100 year event such as the 1964 flood) that the material proposed to be added by this project is inconsequential.

3.3.1.3 No Action Alternative

By not placing trees into the tributary channel the potential for the development of debris dams downstream as a result of the material moving downstream would be maintained at current levels. Currently the risk of such an event is low because it would require existing debris dams (which are not in place) coupled with a large flood event.

3.3.2 Threatened and Endangered fish species and Critical Habitat

3.3.2.1 Proposed Action

The proposed action would decrease the volume of sediment transported downstream to habitats used by T & E species (Upper Willamette spring chinook, Upper Willamette steelhead) in the short term by trapping sediments in the headwater stream channel. Long term effects to T & E species would be an increase in the complexity of habitats when the wood moves out of the headwater areas and into lower gradient reaches utilized by T & E species. The migration of this wood into Evans Creek and potentially the Little North Fork of the Santiam will result in localized reductions in the velocity of high flows, which in turn, is expected to cause sorting and deposition of bedload materials.

Entrapment of bedload materials composed of sand, gravel and cobble would improve and create spawning areas for fish. Increased habitat complexity also improves rearing habitat for juvenile fish and aids in retaining debris and nutrients. Habitat quality is expected to improve through project implementation, as is the condition of Critical Habitat for ESA listed fish species.

3.3.2.2 Cumulative Effects

Cumulatively this action would add to the recovery of habitat for Threatened and Endangered fish species. This action is expected to result in improved aquatic habitat conditions and improved quality of Critical Habitat for ESA listed fish species.

3.3.2.3 No Action Alternative

No improvement in in-stream habitat quality for Threatened and Endangered fish species would be likely to occur. High levels of fine sediments would continue to be transported down to stream areas designated as critical habitat and occupied by ESA listed species. This will continue to have a negative effect on critical habitat and T & E species in Evans creek until such time as this headwater area stabilizes, a process that may take years or decades.

3.3.3 Other Special Status Fish Species - Cutthroat trout

3.3.3.1 Proposed Action

Effects of the proposed action on cutthroat trout would be similar to those noted above for T & E species (see EA section 3.3.2). Short term effects of the proposed action would decrease the volume of sediment transported downstream to reaches occupied by cutthroat trout. Reducing sediment loads is beneficial to the substrates of Evans Creek and the Little North Fork Santiam.

The proposed action would eventually increase the habitat complexity in the Evans Creek as large wood is transported out of the project area down to Evans Creek. The introduction of structure is intended to result in localized reductions in the velocity of high flows, which in turn, is expected to cause sorting and deposition of bedload materials. Entrapment of bedload materials composed of sand, gravel and cobble would improve and create spawning areas for fish. Increased habitat complexity also improves rearing habitat and aids in retaining debris and nutrients.

3.3.3.2 Cumulative Effects

Cumulatively this action would add to the recovery of habitat for Special Status fish species. This action is expected to result in improved aquatic habitat conditions.

3.3.3.3 No Action Alterative

No improvement in in-stream habitat quality for Special Status fish species would be likely to occur. See EA section 3.3.2.3.

3.3.4 Essential Fish Habitat

3.3.4.1 Proposed Action

The proposed action would eventually increase the habitat complexity in Evans creek and maybe the LNF Santiam. The introduction of structure is intended to result in localized reductions in the velocity of high flows, which in turn, is expected to cause sorting and deposition of bedload materials. Entrapment of bedload materials composed of sand, gravel and cobble would improve and create spawning areas for fish. Increased habitat complexity also improves rearing habitat and aids in retaining debris and nutrients. All of the effects described are expected to result in improved quality of Essential Fish Habitat.

3.3.4.2 Cumulative Effects

Cumulatively this action is expected to result in improved Essential Fish Habitat in Evans creek and potentially the LNF Santiam over time.

3.3.4.3 No Action Alternative

No improvement in the quality of Essential Fish Habitat would be likely to occur.

3.3.5 Soils

3.3.5.1 Proposed Action

Most of the proposed activities would be likely to have no detectable effect on the soils adjacent to the channel because they would occur within the channel bed.

The proposal to push over and remove trees from a Douglas fir stand nearby would have a direct effect on the soil in that area. Soil bound to the trees root system would be pulled up, inverted and disturbed as the trees are pushed over. This effect is analogous to what occurs when trees are toppled during large wind storms and thus is similar to the natural disturbance regime and part of the normal process of soil formation in these forests.

Removal of the trees after they are toppled is not part of the natural disturbance regime. Any soil that remains attached to the trees roots would be removed from the site along with all of the organic material and nutrients stored in the tree (i.e., carbon, nitrogen, phosphorous, etc.). 40 trees are equivalent to roughly 4% of the above ground biomass in a 25 acre area adjacent to the road. Removal of this material is unlikely to have any long lasting effect on overall site productivity or the nutrient status of the remaining stand and will be quickly regenerated.

Excavator travel on soil surfaces would likely result in light compaction of the surface horizon of the soil (i.e., an increase in bulk density under 5%) in some locations. The surface compaction would be discontinuous and difficult to detect visually.

With the implementation of the Project Design Features (see section 2.2.1) disturbance would be difficult to detect because surface duff layers and vegetation would buffer and protect the mineral soil.

Foot traffic on soil surfaces would likely result in light compaction of the surface horizon of the soil (i.e., an increase in bulk density under 5%) in some locations. The surface compaction would be discontinuous and difficult to detect visually. In addition, some surface erosion might be associated with people moving on steep, unstable slopes. In most areas, disturbance would be difficult to detect because surface duff layers and vegetation would buffer and protect the mineral soil.

Erosion control methods might help reduce the rate and quantity of surface erosion on exposed soil surfaces. This would help retain organic matter, nutrients and moisture which would, over time, lead to the establishment of vegetative communities and improved soil stability.

Light, discontinuous compaction of the surface horizon of the mineral soil would be unlikely to result in any reduction in soil productivity or disturb normal soil processes. Soil bulk density and processes would likely recover to pre-disturbance condition within one year following the project.

3.3.5.2 Cumulative Effects

Because any detrimental effects of the proposed action on soils are expected to be short-term, (maximum one year) difficult to detect and localized, cumulative effects are not anticipated.

Beneficial effects from reductions in surface erosion would lead to improved soil function and stability over the long term and add cumulatively to soil stability in the watershed and an overall cumulative reduction in erosion.

3.3.5.3 No Action Alternative

No additional soil disturbance would occur. Surface erosion of areas that are currently un-vegetated would continue at current rates.

3.3.6 Channel Function and Water Quality

Sources incorporated by reference: Hydrology Report, *Evans Creek Slide Site Description*

3.3.6.1 Proposed Action

Channel Function

Placing wood, organic material, trees with root wads attached and other materials that increase roughness into channels in the Evans Creek watershed would affect streamflow and channel morphology by altering channel geometry, reducing stream velocity and redirecting flow around the obstructions. Site specific effects can be anticipated, but cannot be precisely predicted.

These include: reductions in stream gradient and flow velocity upstream of obstructions with consequent deposition of suspended materials and a fining of (i.e., reduction in the medium particle size) of channel substrates; bed scour and increased velocities downstream of obstructions; increased bank erosion in areas where materials divert stream flow into the bank; reductions in bank erosion in areas where materials divert flows away from the banks.

Overall, the increase in roughness elements in the channel is expected to increase transit time for organic and inorganic materials moving through the system, increase hydraulic "complexity," increase the quantity of sediment transported in the channel but reduce its rate of transport, increase sediment storage, increase complexity and alter the ratio of bed forms (i.e, pools and riffles), and increase over bank flood flows (on a small scale adjacent to deposited materials).

All of these effects are anticipated to be highest immediately after material placement with a gradual diminution until a form of dynamic equilibrium is reached. Again, this can be anticipated but not precisely predicted because timing of this process will be highly dependent upon the timing, quantity and size of winter peak flow events, which are stochastic in nature. In addition, over time the materials are expected to trap wood moving downstream; trees in the riparian canopy will continue to grow, age and eventually fall into the channel. This will result in continued increases in the quantity and complexity of wood in the channel over the next century. It is anticipated that these alterations to channel morphology and hydraulics will directly increase habitat diversity, aquatic community complexity and structure, and the diversity of aquatic organisms to the benefit of aquatic species in the Evans Creek watershed.

Water Quality

Evans Creek is subject to the conditions of the Willamette Basin TMDL completed by the Oregon Department of Environmental Quality (ODEQ) in 2005 (http://www.deq.state.or.us/wq/TMDLs/docs/sandybasin/tmdlwqmp.pdf). Essentially, the TMDL requires the recovery or maintenance of full potential shade along all perennial streams in the Willamette basin.

This project was identified in the North Santiam Water Quality Restoration Plan[3] as a high priority for restoration of water quality in the Little North Santiam watershed.

Although the primary objective of this project is the recovery of channel stability for the reduction of suspended sediment and turbidity, increased vegetative cover on the tributary channel would help restore full potential shade at the site. Over the short term, stream temperature would be largely unaffected by this proposal: although some reduction in stream temperature could result from the increase in sediment deposition and shading of surface waters by the trees, it would be difficult to detect.

[3] Willamette Basin Water Quality Restoration Plan. April 16, 2008, Bureau of Land Management;, Salem and Eugene Districts, Chapter 5 North Santiam WQRP p 41.

Over the long term (years to decades), recovery of a stable vegetative community would help maintain cool temperatures in the springs that emerge in the source area of the project channel.

Downstream of the project area this action would have no immediate effect on water quality since stream flow would be low during tree placement. Over the long term (months to years) the proposed action is expected to help improve and maintain water quality by slowing the transport of sediment through the system and providing additional slow water velocity areas for the deposition of fine particles (silts, sand and clays). The proposal may also help stabilize the tributary channel thus reducing the number and size of failures and debris torrents.

3.3.6.2 Cumulative Effects

Cumulatively this action would add to the recovery of aquatic habitat, sediment transport regime and functional stream channels in the Evans Creek watershed. This could contribute to a long term reduction in the high turbidity which is reducing water quality downstream and adding to the City of Salem's water treatment plant costs.

3.3.6.3 No Action Alternative

The sediment currently stored in an unstable position at the head of the tributary would be expected to fail and route quickly through the system into the North Santiam river. The loss of this material would remove weight at the toe of the slope behind thus increasing the risk of further land-sliding. The result would be a continuation of the current cycle of land-sliding which sets the stage for further failure upslope. Persistent turbidity with occasional plumes of highly turbid water would continue to be released unabated from the tributary channel as the unstable soil mass in the headwaters continues to erode and fail.

3.4 Compliance with the Aquatic Conservation Strategy

3.4.1 Compliance with Components of the Aquatic Conservation Strategy:

Table 4 shows compliance with the four components of the Aquatic Conservation Strategy for all Action alternatives (1/ Riparian Reserves, 2/ Key Watersheds, 3/ Watershed Analysis and 4/ Watershed Restoration) at the project (site) scale.

Table 3: Compliance with Components of the Aquatic Conservation Strategy

ACS Component	*Project Consistency*
Component 1 - Riparian Reserves	The proposed project is expected to have a long-term beneficial effect on Riparian Reserves (EA section 3.0).
Component 2 - Key Watershed	The Little North Fork Santiam 5th field is a Tier 1 Key Watershed. This project would restore help stream channel complexity (RMP p. 7). .

ACS Component	*Project Consistency*
Component 3 - Watershed Analysis	The Little North Fork Santiam Watershed Analysis was conducted in 1997 by the BLM and the Willamette National Forest. The following are watershed analysis goals and/or findings that apply to or are components of this project: Recommendation 8 (Finding 9): Determine sources of turbidity in Canyon, Sinker, Kiel, Evans, and Fawn Creeks and design enhancement projects to reduce inputs in streams where possible. (WA Ch.7, Pg.9).
Component 4 - Watershed Restoration	The proposed project is a restoration project. The restoration objectives of this project are described in EA section 1.2.

3.4.2 Documentation of Consistency with the Nine Aquatic Conservation Strategy Objectives

Neither the Proposed Action nor the no Action Alternatives would prevent the attainment of any of the nine Aquatic Conservation Strategy Objectives Current conditions and trends would continue and are described in *EA Section 3.0*. This project was reviewed against the ACS objectives at the project scale (im-or-2007-60). Table 4 describes the project's consistency with the nine Aquatic Conservation Strategy Objectives.

Table 4: Consistency with the Nine Aquatic Conservation Strategy Objectives

Consistency with ACS Objectives	*Reasoning*
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. *Both the Proposed Action and the No Action Alternatives do not retard or prevent the attainment of ACS objective 1.*	**No Action Alternative:** The No Action alternative would maintain the simplified aquatic habitat that currently exists. The current distribution, diversity and complexity of watershed and landscape-scale features would also be maintained. **Proposed Action:** The diversity and complexity of aquatic habitat would be enhanced. The aquatic system would be restored to more closely resemble that to which the species, communities and populations are adapted.
Maintain and restore spatial and temporal connectivity within and between watersheds. *Both the Proposed Action and the No Action Alternatives do not retard or prevent the attainment of ACS objective 2.*	**No Action Alternative:** Current connectivity within and between watersheds would be maintained. **Proposed Action:** Connectivity within the watershed may be improved through improvement of habitat complexity.
Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations. *Both the Proposed Action and the No Action Alternatives do not retard or prevent the attainment of ACS objective 3.*	**No Action Alternative:** The current condition of physical integrity would be maintained. **Proposed Action:** The physical integrity of shorelines, banks and bottom configurations would be restored by means of reintroduction of large structural elements and the retention of bedload and suspended sediment that currently is routed rapidly through the system.

Consistency with ACS Objectives	*Reasoning*
Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. *The Proposed Action does not retard or prevent the attainment of ACS objective 4. The No Action Alternative may retard the attainment of ACS objective 4.*	**No Action Alternative:** The current condition of the water quality would be maintained. The result is a cycle of landsliding which sets the stage for further failure upslope and persistent high turbidity events in Evans Creek and the Little North Santiam watershed. **Proposed Action:** The proposal may reduce the number and severity of channel failures as well as help to retain sediment in storage following such failures. This could, over the long term, help reduce high turbidity levels in the Evans Creek watershed.
Maintain and restore the sediment regime under which aquatic ecosystems evolved. *The Proposed Action does not retard or prevent the attainment of ACS objective 5. The No Action Alternative may retard the attainment of ACS objective 5.*	**No Action Alternative:** The sediment currently stored in an unstable position at the head of the tributary would be expected to route quickly through the system into the North Santiam river. The loss of this material would remove weight at the toe of the slope behind thus increasing the risk of further landsliding. The result is a cycle of landsliding which sets the stage for further failure upslope and persistent high turbidity events in Evans Creek and the Little North Santiam watershed. **Proposed Action:** Structure addition in the tributary channel would restore the roughness elements that likely existed prior to forest management. The structure would be expected to retain a substantial portion of the sediment stored in the channel headwaters. Throughout the project area the sediment regime would be restored to one more closely resembling that under which the aquatic ecosystems evolved.
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. *Both the Proposed Action and No Action Alternatives do not retard or prevent the attainment of ACS objective 6.*	**No Action Alternative:** No change in in-streams flows would be anticipated. **Proposed Action:** The project is not expected to change instream flows, however, it would result in localized reductions in the velocities of high flows, and would restore patterns of sediment, nutrient and wood routing.

Consistency with ACS Objectives	*Reasoning*
Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands. *Both the Proposed Action and No Action Alternatives do not retard or prevent the attainment of ACS objective 7.*	**No Action Alternative:** The current condition of flood plains and their likelihood of inundation, as well as the water table elevations in meadows and wetlands is expected to be maintained. **Proposed Action:** The project channel and Evans Creek channel have limited floodplain habitat due to confinement by canyon walls. However, the addition of large structure is likely to restore floodplain inundation and water table elevation to the extent that the channel allows. Little or no effect is expected in meadows and wetlands or lower gradient reaches at the confluence of Evans Creek with the Little North Santiam river because most material in transport (i.e., wood, sediment, logs, etc.) will not pass more than 300 feet beyond the low gradient, unconfined section of channel at the outlet of Evans from the steep and confined upper canyon approximately 3,000 feet upstream from the Little North Santiam river.
Maintain and restore the species composition 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 distributions of coarse woody debris sufficient to sustain physical complexity and stability. *The No Action Alternative would retard the attainment of ACS objective 8 while the proposed Action may contribute to attainment.*	**No Action Alternative:** Continued slope instability and persistent debris torrents that scour the tributary channel and undermine the stability of adjacent slopes will retard the development of a stable and mature riparian area. The No Action Alternative and would continue to retard attainment of ACS objective 8. **Proposed Action:** Over the short term the proposal is unlikely to have much effect on the species composition and structural diversity of riparian plant communities. Over the long term (years to decades), the proposal may help restore stability to the tributary channel which would allow for the development of a mature riparian forest on the adjacent slopes. This would contribute to attainment of ACS objective 8.
Maintain and restore habitat to support well-distributed populations of native plant, invertebrate and vertebrate riparian-dependent species. *The Proposed Action does not retard or prevent the attainment of ACS objective 9. The No Action Alternative may retard the attainment of ACS objective 9.*	**No Action Alternative:** The aquatic habitat would remain in a simplified state with limited capability of supporting well-distributed populations of native invertebrate and vertebrate populations. **Proposed Action:** Aquatic habitat in Evans Creek would be more capable of supporting well-distributed populations of native invertebrate and vertebrate populations due to increased habitat complexity and diversity.

4.0 LIST OF PREPARERS

Resource	*Name*
Cultural Resources	Fran Philipek
Hydrology/ Water Quality/Soils	Patrick Hawe
Botany TES and Special Attention Plant Species	Terry Fennell
Wildlife TES and Special Attention Animal Species	Corbin Murphy
Fisheries	Darrin Neff
Recreation Sites and Visual Resources Management and Rural Interface	Zach Jarrett
Silviculture/Forestry	Charley Thompson
Engineering	Dan Nevin
Geology/Public Safety	Doug Shank
Fuels/Fire Ecology	Barb Raible

5.0 CONTACTS AND CONSULTATION

5.1 Coordination with other Agencies and Organizations

5.1.1 Coordination with the North Santiam Watershed Council

The North Santiam Watershed Council is also a partner in the project, providing coordination with landowners and interested parties as well as assistance in project design.

5.2 Consultation (ESA Section 7 and Section 106 with SHPO)

5.2.1 ESA Section 7 Consultation

5.2.1.1 US Fish and Wildlife Service

This project would not affect to northern spotted owls due to the nature and timing of the project. No suitable habitat would be removed or downgraded, and suitable habitat would be maintained after individual tree removal for the project. The vicinity has been surveyed to protocol and there were no spotted owl responses. The project would occur outside of the breeding season for spotted owls.

The project area is not located in Critical Habitat and is not located within disruption distance of any known spotted owl sites.

The Oregon Department of Fish and Wildlife (ODFW, 1997) has no historic documentation or evidence of bull trout in the Little North Santiam watershed. Based on lack of historical evidence of Bull trout presence in the project area, and lack of sightings by survey crews, Bull trout are not expected to be present within the project area.

5.2.1.2 NOAA Fisheries (NMFS)

Determinations have been made that the project may affect, but is not likely to adversely affect Upper Willamette River (UWR) steelhead trout or UWR chinook salmon. Consultation with NOAA Fisheries will be conducted under the Aquatic Restoration Biological Opinion, dated April 28, 2007.

5.2.2 Cultural Resources - Consultation with State Historical Preservation Office:

Under the existing protocol with the State Historic Preservation Office consultation on this project is not required.

5.3 Public Scoping and Notification

A scoping letter was sent on February 22, 2008 to federal, state and municipal government agencies and interested parties on the Cascades Resource Area mailing list. The letter briefly described the project and included a map of the project area. In addition, a public presentation of the project was given to the North Santiam Watershed Council on February 14, 2008 in Stayton, Oregon. Six scoping comment letters were received. Table 1 shows the concerns that were raised in scoping and where they were addressed in this document. The following comments were received in response to the scoping letter and presentation:

5.3.1 Scoping Comments and BLM Response

- *Will you cable or "engineer" structures in place? It seems as though the channel is so steep nothing will stay unless its cabled in.*

  There are several reasons why "engineering" structures in place is not proposed. The primary reason is effectiveness of such structures: most studies of projects with cabled or engineered structures have found that attempts to cable in-place or force wood to stay in one place have ultimately failed. Due to the tremendous forces exerted on material in a steep headwater channel it would require extremely costly and environmentally intrusive methods to engineer trees to stay in place. The proposed design would use the trees themselves in combination with careful selection of placement sites that have existing structural and/or geomorphic features determined most likely to retain the placed wood. In addition, we assume that not all tress will be retained and the EA has looked at the risks and benefits associated with this.

- *You should consider the possibility of cable yarding material into place..it may be less expensive than bringing in a helicopter.*

The BLM considered the alternative of cable yarding material into place in the channel rather than using helicopter. While theoretically feasible, there are several reasons why using a skyline instead of a helicopter to place logs is impractical:

- Placing logs 100 feet apart would require a separate skyline setup for each log. This involves several hours of work to string each line, making this a multi=day project for each hour of flight time.
- Log placement would be dictated by skyline location, not the best location in the stream channel.
- The long span (2,000 feet +) would require very large skyline yarder. These are uncommon now, therefore very expensive. Also, they are expensive to move and set up.
- If adequate anchors are not available, equipment anchors would be required. Placing equipment anchors disturbs soil and causes environmental impact that would not be necessary with helicopter placement. Tree and stump anchors may also require falling or other impacts.
- Long periods between log drops required by string skylines in multiple locations would require more days of instream work and inefficient use of log placement and securing resources (crew and/or machinery).
- In short, helicopters would provide for a better job with more precise placement, less expensive in the long run, and less impact to the environment.

- *Our concern is for potential of flood. Our second concern would be that this project does not environmentally impact the lower end of the tributary by increasing or decreasing water levels, change turbidity of the water, affect underground water quality (well) or alter access banks that would impact safe use as a recreational area for our disabled clients.*

  In response to the concerns of downstream landowners, such as above, the BLM conducted a thorough review of public safety risks from potential flooding due to the proposal. See the Public Safety (Section 3.3) portion of the EA for results.

  The other concerns mentioned (i.e. access to the channel by disabled clients, water quality of wells, changes in "water levels") were not analyzed separately in the document because they are not likely to be affected by the proposal. This proposal is unlikely to have any effect on water levels in the lower channel either during large floods (as explained in the Public Safety section of the report) or during normal year round flows. The proposal would not alter ground water inputs or withdrawals and therefore there is no mechanism for this proposal to affect ground water quality or quantity.

  The potential for this proposal to alter or affect the bed, banks and floodplain of the lower channel is also low, as discussed in the section on public safety. Therefore, it is unlikely the proposal would affect access for recreational purposes.

5.3.2 EA public comment period

The EA will be made available for public review June 25, 2008 to July 11, 2008. The notice for public comment will be published in a legal notice by the *Stayton Mail* newspaper. Comments received by the Cascades Resource Area of the Salem District Office, 1717 Fabry Road SE, Salem, Oregon 97306, on or before July 11, 2008 will be considered in making the final decisions for this project.

6.0 MAJOR SOURCES

6.1 Major Sources

Hawe, Patrick. 2007. *Evans Creek Slide Site Description.* Internal unpublished report. Salem District Bureau of Land Management.

Shank, Doug. 2008. *Evans Creek Slide Risk Assessment.* USDA Forest Service, Willamette National Forest.

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USDI, U.S. Fish and Wildlife Service, Oregon Fish and Wildlife Office. March, 2005. *Biological Opinion and Letter of Concurrence for Effects to Bald Eagles, Northern Spotted Owls and Northern Spotted Owl Critical Habitat from the U.S. Department of the Interior; Bureau of Land Management, Eugene District and Salem District, the U.S. Department of Agriculture; Mt. Hood National Forest and Willamette National Forest and the Columbia River Gorge National Scenic Area Calendar Years 2005-2006. Habitat Modification Activities within the Willamette Province.(FWS Reference Number 1-7-05-F-0228).* Portland, Oregon

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USDI, Bureau of Land Management. 2003. Oregon and Washington Bureau of Land Management Special Status Species Policy. BLM Instruction Memorandum No. OR-2003-054. Oregon State Office, Portland, OR.