ENVIRONMENTAL ASSESSMENT

OR 090-EA-99-05

A Proposal to Conduct Aquatic Restoration Project in the Deer Creek Drainage

CONTENTS

1.0 Purpose of and Need for Action

1.1 Introduction

The Bureau of Land Management (BLM) proposes to implement an aquatic restoration project in the Deer Creek Drainage during the summer of 1999. The emphasis of the project would be to pull over whole trees from nearby riparian reserve locations to restore identified missing instream habitat elements. The proposed project would occur within the Central Cascades Adaptive Management Area (CCAMA) and within a selected Riparian Reserve (RR) as designated in the Record of Decision for the Northwest Forest Plan Environmental Impact Statement (SEIS/ROD) pp. 6 and 7. Deer Creek enters the Lower McKenzie River near the town of Nimrod, approximately 35 miles east of Springfield, Oregon. The sub-basin is approximately 9500 acres in size of which the BLM manages nearly 700 acres. The analysis area is located within T. 17 S., R. 3 E., Section 9 of the Willamette Meridian (see Appendix 2, Project Area Map for location).

A Watershed Analysis has been conducted for the Bear/Marten Watershed (July 1998); Deer Creek was part of this analysis effort. The proposed project is among several project opportunities identified in the analysis, and is conformance with the Aquatic Conservation Strategy (ACS) objectives as described in the Standards and Guideline of the Northwest Forest Plan. The Watershed Analysis is hereby incorporated by reference.

Instream habitat survey conducted in the summer of 1992 within the Deer Creek drainage found that the percentage of pool habitat, especially pools associated with large woody debris (LWD), was less than 20 percent of the area surveyed. The low amount of instream habitat complexity can be attributed to past stand replacement fires, intensive logging, and road building within the drainage. Simplification of aquatic habitat reduces abundance and taxonomic diversity of all aquatic and some terrestrial organisms as well as eliminates the capacity of streams to retain organic material, an important food source for aquatic macroinvertebrates and a major component of aquatic food webs (Murphy and Meehan 1991).

Management goals:

- improve spawning/rearing habitat for juvenile salmon, steelhead, and cutthroat trout.
- improve forage habitat potential for bull trout.
- facilitate migration for all fish in Deer Creek.

Project objectives:

- accumulate gravels, and
- raise active channel where possible to allow floodplain connection.
- create off-channel rearing habitat.
- increase material/nutrient retention time.

1.2 Conformance

This EA is tiered to the Record of Decision (ROD) for Amendment to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl, April 1994, and the Eugene District Record of Decision and Resource Management Plan (RMP), June 1995. Actions described in this EA are in conformance with the Aquatic Conservation Strategy (ACS) Objectives listed on page B-11 and the Standards and Guidelines for Riparian Reserves on pages C-31 to C-37 of the Northwest Forest Plan (ROD). These documents are available for review at the Eugene District Office of the BLM, Eugene, Oregon.

The Analysis File contains additional information used by the interdisciplinary team (IDT) to analyze impacts and alternatives and is hereby incorporated by reference.

1.2.1 Relationship to Statutes

This Environmental Assessment (EA) is being prepared to determine if the proposed action and any alternatives would have a significant affect on the human environment, thus requiring the preparation of an Environmental Impact Statement (EIS) as prescribed in the National Environmental Policy Act of 1969. It is also being used to inform interested parties of the anticipated impacts and provide them with an opportunity to comment on the various alternatives. Finally, the EA is being used to arrive at final project design to meet a variety of resource issues as well as provide the decision maker the most current information relating to these projects upon which to base the decision.

1.2.2 Monitoring

Monitoring guidelines are established in the 1995 RMP/ROD, Appendix D, and the 1994 Standards and Guideline, pp. E-1 to E-10. An additional site specific monitoring plan has been developed to evaluate the effectiveness of project objectives at meeting management goals. The monitoring plan includes:

- Pre-project measurement of stream gradient and channel cross-sections at proposed individual placement sites.
- Pre-project determination of streambed particle size distribution in project area.
- Stream gradient and channel cross-section measurements at placement sites after first winter, with repeated measurements based on future flood events (determined by hydrologist and/or fisheries).

1.3 Scoping

The scoping process identified the agency and adjacent landowners concerns relating to the proposed project and defined the issues and alternatives that would be examined in detail in the EA.

The process was started in 1994 where the affected and interested parties met to address the needs of bull trout and spring chinook in the McKenzie River. Representatives from BLM, U.S. Forest Service (USFS), Weyerhaeuser, Oregon Department of Fish & Wildlife (ODFW), Olympic Resource Management (representing John Hancock Inc.), and Trout Unlimited again met in March 1998 to discuss potential restoration projects located in tributaries to the Lower McKenzie River. From this effort, the group of representatives developed drainage-level restoration objectives for Deer Creek and began the process of forming site specific project proposals.

Additional issues, concerns, and opportunities were identified by the interdisciplinary team (IDT) assigned to develop the restoration project.

Scoping by the IDT and the inter-agency input identified the following four issues:

1. *What would be the impacts associated with the displacement of soils at the tree-lining sites, and/or the pathways used to pull trees to the stream channel?*

2. *What are the potential effects to the stream channel, including the stream banks?*

3. *What are the effects of temporary road closures during project implementation?*

4. *What would be the effects of lining trees across the road bed/prism?*

1.4 Issues Identified But Eliminated From Detailed Analysis

What are the effects to nearby canopy structure if selected trees are uprooted?

Potential canopy openings would be minimal due to the overall low number of trees targeted (30) for the project, the wide spacing between structure locations (75-500 feet between structures), and to the low number of trees per instream structure location (maximum 3 per location). Overall stand and canopy conditions would be improved by the proposed project.

2.0 Alternatives Including The Proposed Action

2.1 Alternatives Considered

2.1.1 Alternative I - No Action

Under this alternative, the opportunity to improve in-channel habitat features such as complex pools associated with large woody debris, off-channel rearing areas, and increased flood plain connection would not occur. Existing fish populations in Deer Creek would not benefit from the proposed aquatic habitat enhancement.

2.1.2 Alternative II - Proposed Action Alternative

The primary goal of the project is to restore large down wood to the aquatic and riparian ecosystem along the lower portion of Deer Creek. The BLM proposes to place approximately 30 Douglas fir trees (24"-48" dia.) in the lower reaches (½ mile) of Deer Creek for aquatic habitat enhancement (see Appendix 4 for seasonal restrictions) . Whole trees and portions of whole trees from the adjacent riparian reserve would be pulled over and uprooted using a hydraulically driven yarder and cable (“tree-lining”) into the stream channel at designated locations. Selected trees would either fall directly into the stream channel or would be pulled downhill short distances into the stream channel. The project was designed by an interdisciplinary team consisting of a fisheries technician, hydrologist, soil scientist, silviculturist, and an engineer.

2.2 Design Features For The Proposed Action Alternative

Activity	Design Feature
1. Tree selection	- See Appendix 4 for Seasonal Restrictions. - No trees to be removed from Fragile-Nonsuitable soils. - Select trees away from immediate streambanks. - Select trees or groups of trees prior to implementation. - Coordinate tree selection and placement with Hydrologist or other Soil/Water Specialist. - Select trees that would not disturb identified survey & manage mollusk sites (minimum 30' radius “no-touch” area around each site).
2. Lining of trees - preparation of trees	- If needed, water will be pumped from creek to loosen soil and roots prior to lining. Hose intake will be screened to prevent fish from entering intake.
- use of yarder	- Yarder required to stay on road or pullout surface; use warning signs and flaggers on road to insure motorist safety; keep traffic delay to a minimum.
- use of cables and blocks	- Protective sheaths (rubber tires or equivalent) will be placed around anchor trees; re-spool cable where there is high potential to damage standing trees.
- lining path	- Avoid damage to standing trees, snags, down wood, and other habitat features.
3. Yarding of trees	
- yarding paths and disturbance to soils	- Choose tree travel corridors to minimize the extent of soil displacement upslope and to minimize disturbance of streambank vegetation; travel corridors should not exceed 10 % of project area. - When possible partially suspend logs during yarding; replant disturbed soil with approved native seed mix (consult with Area Soil Scientist). - Keep yarding distances for individual trees to less than 300 feet.
- yarding paths that cross 17-3E-9 road	- Require the use of a “rub-log” when trees are yarded across the road surface. - Require damage repair of road surface, and/or ditch line upon completion of project.
4. Installation of trees in channel	
- selection of placement sites	- Sites selected based upon channel shape, presence of natural anchor points, and apparent likelihood of site to retain wood; sites will be spaced 75-500 ft. apart.
- design of structures	- Each site consists of 1-3 whole trees pulled towards the stream to form a loose accumulation; trees will be lined so that fallen trunk lands in active channel with a portion of the tree suspended above the channel and on the bank; trees and logs will be positioned at that most stable angle for the site (usually 30-90 degrees from downstream channel edge). - Place trees on streambanks or in the stream once; do not relocate tree once in place.
- anchoring of trees	- No anchors would be used because tree lengths including root wad will be 2-3 times active channel width and approximately 75% of tree will be on the bank.

2.3 Alternatives Considered But Eliminated From Further Analysis

An alternative to use pieces of trees from a nearby area of wind-thrown trees

(Goodpasture Salvage Site) was considered. This proposal would utilize pieces of the trees (up to 50 ft. in length and 20"-24" diameter) to construct instream structures. Log pieces would be hauled into the channel and placed with ground based equipment (excavators/front-end loaders). This alternative was discarded because of impacts from using heavy equipment to access and work in the stream channel. Also, the available log lengths from the Goodpasture Salvage site were determined to be too short in length for use in the size of stream channel found in the proposed project area.

2.4 Comparison of Action Alternatives

	Alternative 1 - No Action	**Alternative 2 - Proposed Action**
Soil Displacement (Issue # 1)	No	Yes; low potential for sediment input into stream channel during implementation. No long term erosive losses.
Stream Channel / Bank Disturbance (Issue # 2)	No	Yes; short term negative effect to water quality. Long term positive effect to channel complexity, instream habitat.
Road Closures (Issue # 3)	No	Periodic day time closures.
Damage to Road Bed (Issue # 4)	No	Damage would be repaired upon completion of the project.

3.0 Affected Environments

This chapter will describe relevant components of the existing environment. The plants and animals do not differ significantly from those discussed in Chapter 3 RMP, 1994.

3.1 Vegetation

Silviculture - The primary forest canopy in the project area is occupied by a few hardwood species within the flood plain and mostly Douglas-fir on the adjacent slopes. Mature big leaf maple and red alder dominate the flood plain along with a scattering of relatively small conifers including Western hemlock, Western red cedar, and Douglas-fir. Douglas-fir along with some Western hemlock and Western red cedar covers the adjacent slopes. They seeded in following the large wildfire which occurred in the McKenzie Valley late in the last century. Vine maple and sword fern occupy the understory.

Botany - Surveys for Special Status Vascular plants were done during the 1998 field season. One site of *Cimicifuga elata* was located during the survey. The site is upstream of the proposed project area and would not be impacted by the proposed actions.

Surveys for Survey and Manage non-vascular species (bryophytes and lichens) were done during the 1998 field season. No Survey and Manage species were found. Project file contains a list of species included in the survey.

3.2 Wildlife

3.2.1 Threatened and Endangered Species

Northern Spotted Owl - An historic spotted owl site center is located approximately 0.5 mile from the proposed project. Contiguous suitable nesting habitat from this site encompasses the project area. The project would drop approximately 30 conifer trees in suitable habitat to be used as contribution to in-stream restoration structures. Noise disturbance to this site is possible during nesting season (see Appendix 4 for seasonal restrictions).

The project is covered under the 1998 Habitat Modification Biological Opinion for the Willamette Province. Reasonable and Prudent Measures include minimizing disturbance to spotted owl pairs and their progeny. Mandatory terms and conditions to implement these measures include: For activities within a 0.25 mile radius (or further if deemed necessary by an agency wildlife biologist) of any known spotted owl activity center as seasonal restriction will be in place between March 1st to June 30th (or later if deemed necessary). This may be waived if surveys indicate nesting has not occurred or that no young are present (see Appendix 4 for seasonal restrictions).

Any portion of the suitable nesting habitat in the nearby site, which includes the proposed project habitat, could be in use during a given year

Bald Eagle - No known nest or roost locations would be affected by the project area. The project section is a designated Bald Eagle Habitat Area. The project design is consistent with the management objectives of this habitat.

3.2.2 Other Wildlife Species

Osprey - A known active osprey nest exists approximately 0.25 mile to the north near the McKenzie River (see Appendix 4 for seasonal restrictions).

3.3 Survey and Manage

3.3.1 Mollusks

The project area is suitable habitat within the expected range of 3 of the 4 Survey and Manage species present on the Eugene District: *Megomphix hemphilli* (Oregon megomphix), *Prophysaon coeruleum (*Blue-grey tail-dropper), and *Prophysaon dubium* (Papillose tail-dropper). Typical key habitat features present include: big leaf maples and other hardwoods, significant amounts of sword fern, leaf litter, down woody debris and moist microclimates. Surveys were conducted as directed in current protocols in and near all disturbance features such as access routes and potential stockpile locations.

“Confirmed sites” are defined as locations with a detection of at least one live individual or shell of any Survey and Manage species. Surveys detected 10 *Megomphix hemphilli* confirmed sites distributed throughout the project area

3.4 Soils

Two soil types are encountered in the project area. The Saturn series occupies gentle slopes (<5%) along the narrow valley bottom immediately adjacent to Deer Creek. This deep, well drained soil formed in poorly sorted alluvium. The surface soil is typically a cobbly loam about 10 inches thick over a gravelly loam subsoil about 20 inches thick. The substratum is an extremely gravelly loamy sand to about 60 inches. Overstory vegetation is dominated by larger diameter bigleaf maple, red alder, viney maple. Very little open ground surface occurs currently. Permeability of this soil is moderate. Effective rooting depth is 20 to 40 inches, limited by the very gravelly substratum. Runoff is slow and the hazard of water erosion is slight. A high water table is at a depth of 3.5 to 5.0 feet from December to March. The soil is subject to occasional periods of flooding.

Klickitat stony loam occupies the upland positions where trees would be gathered. This deep, well drained soil formed in colluvium derived from igneous rock.

Slopes are steep, 60 to >75%, on both aspects above Deer Creek. The surface soil is a stony loam about 13 inches thick over a very cobbly clay loam subsoil about 26 inches thick. The substratum is an extremely cobbly clay loam to about 50 inches. Overstory vegetation is dominated by larger diameter Douglas-fir with a few hardwoods contained. Permeability of this soil is moderate. Effective rooting is over 40 inches. Runoff is rapid and the hazard of water erosion is high. Both soils in the project area are classified as Moderate Soil Resiliency. The resiliency unit concept combines such factors as soil temperature and moisture regimes, soil drainage, depth, coarse fragment content, texture, water holding capacity, organic matter content, permeability, etc. to project how various sites/soils would respond to disturbance. High resiliency soils can sustain some manipulation and still maintain nutrient capital, inherent physical and chemical properties, hydrologic function, and natural rates of erosion. In comparison, this area is less productive and less resilient to surface disturbance because soils are not overly deep; they occupy steep topography, or drier sites, or have higher coarse content. Additional mitigation measures are typically needed to reduce surface disturbance and maintain surface organic matter on soils of moderate resiliency.

3.5 Water Quality

The proposed Deer Creek stream restoration project site begins approximately 0.25 mile above the confluence with the McKenzie River and extends upstream for another 2000 feet. Deer Creek, a fifth-order tributary, flows in a northerly direction and drains a watershed of 9828 acres (15.36 mi^2). The Deer Creek watershed network includes approximately 79 miles of streams. Drainage density for the entire Deer Creek drainage is 5.14 (miles of channel/square mile of area).

The proposed project site is along the mainstem Deer Creek at a location that is generally oriented in a ESE-WNW position. Surrounding side-slopes are steep with the northerly side at approximately 54% and southerly side at approximately 71%. The stream channel is slightly incised. Remnant features exist in the channel to suggest that the stream was at one time better connected to the flood plain with well defined point-bars. The flood plain at the proposed project site ranges in width from about 100 feet to around 300 feet.

Stream side or flood plain vegetation is predominantly a shrub, hardwood, and grass mixture. Conifers dominate the surrounding side-slopes but are absent from the flood plain. Stream shading effects are predominantly orthographic and supplied by the surrounding steep hill slopes. Stream temperatures in 1998 were recorded in Deer Creek from early July until mid-August. Beginning 7-day moving average maximum temperature was 16.6 ^{o}C (61.9^{o}F) in early July and reached a high of 19.7^{o}C (67.5^{o}F) by late July. Seven day moving average maximum temperatures remained above 17.5^{o}C (63.5^{o}F) until mid-August. The lowest 7-day moving average maximum temperature of 11.1^{o}C (51.8^{o}F) was recorded in early October.

Changing streamflow patterns, bedload transport characteristics, and large woody material recruitment in the Deer Creek drainage are likely the result of the interaction of past and present management activities (e.g. road building and timber harvesting) with naturally occurring events (e.g. fires and floods). Road building reduced the amplitude and frequency of stream meander patterns by constricting Deer Creek to a narrower valley floor which in turn reduced its ability to access a segment of its natural flood plain. By narrowing and straightening the channel path, flow velocities may have increased as a result of changing stream gradients attempting to dissipate stream energy. Increased stream energy would typically lead to removal of all finer bed materials and the beginning of movement in larger size components.

Removal of streambank trees within recruitable distances to Deer Creek and the elimination of instream or bank spanning trees, in combination with flow pattern changes has led to circumstances that do not provide or allow for the establishment of adequate sites for streambed materials to accumulate and stabilize. Annual floods typically move stored bedload materials in pulses through the Deer Creek system and ultimately into the McKenzie River. The retention time for gravel and smaller size streambed materials is quite short. Annual, seasonal, or individual event caused movement of streambed materials is thought to occur commonly in the Deer Creek drainage.

Empirical evidence of a high bedload system can be seen by the relative large size of streambed materials. Another way to visualize the relationship between a watershed and its ability to transport bedload or sediment is to look at the drainage density. Deer Creek has a drainage density of 5.14. In other words, Deer Creek requires 5.14 miles of stream channel to drain one square mile of watershed. Drainage density is a function of several physical and biological factors affecting the Deer Creek drainage. These factors include geology, soils, climate, and vegetation cover. Watersheds with higher drainage densities can be characterized by having steep slopes and many, short stream channels. Deer Creek's relatively high drainage density suggests a system that would theoretically yield relatively high amounts of sediment.

3.6 Fisheries

The Deer Creek Sub-basin is fifth order tributary of the McKenzie River. The basin is managed primarily for timber production by BLM (mainstem), USFS (East fork), John Hancock (mainstem), and Weyerhaeuser (mainstem & forks). Historic timber management and fire have contributed in a decline in stream channel habitat complexity in Deer Creek. Habitat surveys conducted in 1987 (BLM) and 1992 (USFS) in the lower mile of Deer Creek describe a moderately unconfined, low gradient channel (2% slope) made up primarily of riffles (57%) and pools (20%).

Streambed substrate consisted predominately of gravel and cobble, but included fair amounts of sand and bedrock, and some small boulders. Cobble embeddedness was very high in this section. Estimates in measured units ranged from 20% to 90% embedded by fines, with the majority exceeding 70%.

The amount of large woody debris (LWD, >36" dbh and >50' long) present in the channel during the surveys indicated an average of 14 pieces per mile. Visits to this stretch of stream channel after the flood event of 1996 found that the majority of the LWD found during the survey had migrated out to the McKenzie River. The resulting loss of LWD in the stream channel has further declined the amount of low-velocity (or complex) habitat available to fish and other aquatic organisms. The loss of structure in the channel has also reduced accumulations of gravels affecting the amount of available spawning habitat (fish species) and altering the macroinvertebrate community.

Riparian overstory vegetation along the immediate streambanks and the floodplain is characterized by a persistent hardwood-dominant canopy interspersed with remnant old growth Dougls-fir trees. Outside of the floodplain the overstory is primarily 90-100 year old Douglas-fir with clumps of old growth conifers left over from the last fire episode near the turn of the century.

A main-line gravel road closely parallels the mainstem of Deer Creek on the East bank. The position of this road compromises a high percentage of the trees available for natural recruitment into the stream channel. In places the road encroaches the stream channel affecting the natural movement of the creek within the floodplain. Past flood events have impacted the floodplain associated segments of road. Efforts to reestablish the roadbed have resulted in riparian vegetation loss and reinforced stream banks.

Fish species that reside or seasonally use Deer Creek for refuge include:

- Spring chinook (proposed threatened species) - Adults have not been observed spawning in Deer Creek in the recent past. Juvenile fish have been observed in the late spring/early summer months during snorkeling surveys, it is believed that these fish are using Deer Creek for refuge from high winter flows in the McKenzie River.

- Steelhead/rainbow trout - winter steelhead (proposed threatened species) are included in the McKenzie River as part of the historical range, it is still undetermined if winter steelhead use Deer Creek for spawning or rearing. Resident rainbow trout (“redsides”), summer steelhead and stocked rainbow trout have been observed using Deer Creek for either spawning, rearing, or feeding.

- Bull trout (listed threatened) - Deer Creek is not suitable for long-term bull trout habitat, but it is believed that bull trout from the McKenzie River forage for prey in Deer Creek during the winter months.

- Cutthroat trout (status review) - Cutthroat trout are found throughout the accessible portions of Deer Creek. Cutthroat may spend their entire life history within the system. A portion of the population may also migrate into the McKenzie River to forage and return to Deer Creek for spawning.

- Sculpins (cottus spp) - Various species of sculpins are found in the lower gradient portions of Deer Creek and its forks. Identification of individual species and their distribution has not been determined within the Deer Creek system.

3.7 Transportation System

The affected environment for this engineering input is focused totally upon the existing road system along the east fork of Deer Creek in Sec 9, T. 17 S., R. 3 E. The road is labeled Rd. 17-3E-9 in BLM records and commonly known as Deer Creek mainline or the 8000 line for the Weyerhaeuser Co. The portion of road up to the Weyerhaeuser gate, approximately at the N-S center line of Sec. 9, is public access. The Weyerhaeuser Co. controls Segment A of Rd. 17-3E-9 starting at the N-S centerline of Sec. 9. The Weyerhaeuser Co. control is for approximately 0.1 mile across the SW corner of Lot 5 in Sec. 9. The BLM has control of Segment B for 2,678 feet on Rd. 17-3E-9 until the road crosses the section line from Sec. 9 to Sec. 10. The project area is along Segment B only (see Appendix 2, Project Area Map for location).

4.0 Environmental Consequences

This incorporates the analysis of cumulative effects in the *USDA, Forest Service and the USDA, Bureau of Land Management Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl*, February, 1994, (Chapters 3 &4) and the *Eugene District Proposed RMP/EIS*, November, 1994 (Chapter 4). None of the alternatives in this Proposed Action would have cumulative effects on resources beyond those analyzed in the documents. The following analysis has a cumulative effects section that supplements those analyzed in the above documents, and provides site-specific information and analysis particular to the alternatives considered here. **Aquatic Conservation Objectives are listed in Appendix 1 and are referred to in the following analysis.**

4.1 Alternative I - No Action

4.1.1 Issue # 1 *What would be the impacts associated with the displacement of soils at the tree-lining sites, and/or the pathways used to pull trees to the stream channel?*

4.1.1.1 Soils

Under this alternative, no project(s) would be carried out. Therefore, there would be no effects to soils.

4.1.1.2 Water Quality

Direct Effects: No initiation of new or increase in present sedimentation rate to Deer Creek is anticipated since upslope vegetation and soil would not be disturbed through displacement and dragging of trees. Hillslope erosion rate and sediment input regime would remain at present levels. Risk of adverse impacts are low if this alternative is selected.

Indirect Effects: The sedimentation regime along Deer Creek would continue at present response rates depending upon natural disturbances to vegetation and soils. Natural processes such as wind, disease, and fire, among others, would continue to cause upslope disturbances that may affect potential sediment input to Deer Creek. The risk of adverse impacts are low if this alternative is selected.

Cumulative Effects: No change is anticipated from present conditions. No additional soil or vegetation disturbance is expected, so it would have no incremental effect on erosional or sedimentation processes.

4.1.1.3 Fisheries

Under this alternative, no project(s) would be carried out. Therefore, there would be no effects to the existing fisheries resource in Deer Creek.

4.1.2 Issue # 2 *What are the potential effects to the stream channel, including the stream banks?*

4.1.2.1 Water Quality

Direct Effects: The movement of bedload would continue unabated in Deer Creek. Opportunities for the accumulation of gravel and smaller size materials would not be provided. Streambed material accumulation would not be augmented and stabilized until a natural event of sufficient size and scope allows for the recruitment of large trees and pieces of woody material.

The risk of direct effects to Deer Creek by selecting this alternative is low and would fall within the range of natural variability for a dynamic stream system.

Indirect Effects: The scour and deposition of stored streambed materials along Deer Creek would continue and possibly lead to localized changes in stream gradient. Such changes could lead to further channel incisement and a general decrease in suitable aquatic habitat.

The risk of indirect effects resulting from the selection of this alternative is low and would fall within the range of natural variability for a dynamic stream system.

Cumulative Effects: No cumulative effect is anticipated with no action.

4.1.2.2 Fisheries

No direct effects would occur under this alternative. However, Indirect Effects would occur in the form of continued degradation of existing instream habitat, and continued loss of bedload materials in the proposed project area. Current conditions would change as natural processes develop.

4.1.3 Issue # 3 *What are the effects of temporary road closures during project implementation?*

4.1.3.1 Roads

There would be no effects to the existing road (17-3E-9) under this alternative because the project would not be implemented.

4.1.4 Issue # 4 *What would be the effects of lining trees across the road bed/prism?*

4.1.4.1 Soils

Under this alternative, no project(s) would be carried out and there would be no negative effects to soils, other than natural processes.

4.1.4.2 Roads

There would be no effects to the existing road (17-3E-9) if the No Action Alternative was selected.

4.2 Alternative II - Proposed Action Alternative

4.2.1 Issue # 1 *What would be the impacts associated with the displacement of soils at the tree-lining sites, and/or the pathways used to pull trees to the stream channel?*

4.2.1.1 Soils

Direct Effects: Direct effects of tree lining and yarding activities would be soil compaction and soil and litter displacement within the individual yarding trails. Minimal compaction is anticipated since the project would be implemented during the summer season when soil moisture contents are low and soils are strong. Spatial extent of displacement and compaction is expected to be low, as only 30 trees would be placed within a channel distance of 2,000 feet. Individual tree selection would aim to maximize the number of stems that can be direct felled into the channel from steep toeslopes, as this most resembles natural downfall. Erosion and potential for sediment delivery would be almost nil for these trees. Greatest potential for displacement and soil gouging would occur when individual trees must be moved to the channel. Whenever possible, trees would be partially suspended through additional blocking or intermediate supports. Potential for sediment to reach the channel is low; narrow zone of flat topography and trees themselves are expected to sufficiently interrupt delivery. This activity meets the intent of ACS objective # 9, but does not prevent the attainment of objectives 4 and 5.

Indirect Effects: The residual effect of localized soil compaction in the corridors could remain on site for 10 to 20 years, depending on the depth of compaction realized. Soil exposure is not expected to persist for more than 5 to 10 years before full vegetative cover is re-established. Hillslope erosion is not expected because these soils are strong, they resist detachment. Sediment delivery is unlikely due to good permeability, and the discontinuous nature of the exposed soil areas. Erosion control measures would be implemented before fall rains in any individual trails that show the potential for continuing erosion, channelization, or sediment delivery to Deer Creek. Therefore, no erosive losses are anticipated beyond the short term direct effects described above.

Cumulative Effects: No cumulative effects are anticipated from this action because effects are limited in space and are short term in nature.

4.2.1.2 Water Quality

Direct Effects: Disturbance of soils and vegetation by dragging trees downslope could possibly provide an avenue for direct sediment input to Deer Creek. Gouging a trough directly to a tree placement site could alter surface and subsurface flow patterns and lead to an increase in the amount of sediment reaching the creek.

The risk of adverse impacts resulting from the selection of this alternative is low. The risk factor is based upon design features and the physical setting along Deer Creek. By suspending the leading end of the trees, as much as practicable, no continuous channel or erosion path would be created to allow sediment input to Deer Creek. The design features would rehabilitate any disturbed sites that could potentially lead to sediment input. By designating trees prior to the action, sensitive areas would be avoided and haul routes optimized to provide for maximum practicable suspension. Any effects are expected to be short-term and be eliminated when disturbed sites re-vegetate, within six months to a year, to pre-activity levels.

The risk of short-term, localized increases in turbidity as a result of direct input of sediment from root masses is high. The amount of additional material anticipated cannot be estimated prior to activity. However, the majority of sediment added through this source is expected to be flushed out of Deer Creek in a few hours with no residual effects expected to last more than a few days. Overall, the attainment of ACS objectives 4 and 5 would not be hindered due to the short-term nature of the described effects.

Indirect Effects: No change in indirect effects are anticipated. The expected natural revegetation of any disturbed sites in combination with applied design features is expected to reduce erosion and sedimentation rates to pre-activity levels.

Cumulative Effects: No change is expected from present conditions. The limited number of trees proposed for lining combined with proper implementation of design features is expected to result in no cumulative or incremental change to overall sedimentation rate to Deer Creek.

4.2.2 Issue # 2 *What are the potential effects to the stream channel, including the stream banks?*

4.2.2.1 Water Quality

Direct Effects: The proposed action could alter the stability or otherwise damage segments of streambanks and possibly the streambed. Dragging trees over and through streambanks could lead to bank erosion resulting from gouging of soil and removal of protective vegetation cover. Bank material would enter Deer Creek and be flushed into the McKenzie River. Short-term increases in turbidity are expected. Damage to streambanks would be short-term if vegetation was re-established along the damaged segments. Streambanks stability would be expected to increase with the establishment of bank vegetation. Long-term effects could occur if the disturbed sites were continuously disturbed by direct hitting stream flows. Such conditions would further de-stabilize the banks and cause a larger sediment source.

Streambed damage could result from dragging tree tops through the channel. Disturbance of bed materials could result in increased material transport and localized streambed instability. Only short-term effects would be anticipated to the streambed.

With the placement of large trees across streambanks it is expected that some streambed materials that would otherwise be transported through the Deer Creek system would be entrained, accumulate, and eventually stabilize (ACS objective # 6). With the accumulation of bedload materials, it is expected that the overall median particle size for streambed materials within the project site would decrease to more gravel sized constituents. As the bedload materials accumulate, localized areas of streambed could rise with the possible result that Deer Creek would access formerly inaccessible segments of flood plain (ACS objective # 7). These effects would begin immediately following stream flows of sufficient size to begin bedload movement and are expected to last until flows are sufficiently large to remove large woody material placed along Deer Creek.

The risk of direct resource damage to Deer Creek resulting from the selection of the proposed action is expected to be low. Effects are anticipated to be within natural variability expected for this system. The possibility of obtaining the hydrologic objectives for this project and in helping to meet ACS objectives, the direct effects are expected to be beneficial.

Indirect Effects: The possibility exists for the deposited materials anticipated through the implementation of this project to be transported and accumulated along Deer Creek at locations that could potentially cause problems. If trees and large woody material are placed along the creek in such a way that it resulted in the accumulation of bedload materials at inappropriate locations, a change in streamflow patterns may occur. Changing the flow path could result in bank erosion at locations outside the project area as the stream system reacts to changes in stream energy by changing meander pattern. If impacts occurred, they would be both short and long-term in duration.

With the use of design features and proper project implementation, the indirect risk of resource damage to Deer Creek is expected to be low and is not expected to prevent the attainment of ACS objectives.

Cumulative Effects: No adverse cumulative effects are anticipated. The accumulation and storage of bedload material is expected to be within the range of natural variability for the Deer Creek system. A positive cumulative effect anticipated with this alternative is the incremental (but not measurable) effect by decreasing stream temperature through the enhancement of shaded refugia.

4.2.2.2 Fisheries

Direct Effects: The volume of large woody debris (LWD) would immediately increase in the stream, on the floodplain, and on the slopes within 100-150 feet of the stream channel. This increase would directly affect the amount of habitat cover available for fish species in the project area (ACS objective #9).

As a result of pulling and positioning whole trees into the stream channel, there may be some localized, short-term increases in turbidity during implementation of the projects and during the first fall storm. Increases in turbidity should quickly return to background (natural) levels.

Damage to streambanks and the loss of streambank vegetation is not expected to be excessive due to project design features. In the short-term, any loss of overhanging streambank vegetation is not expected to increase localized stream temperatures. Over the long-term any vegetative loss would recover with new growth. This action is not expected to prevent the attainment of ACS objectives 4, 5, and 8 because of the low number of sites that may be disturbed over the length of the project area.

Indirect Effects: As a result of the Proposed Action, the project area would receive large “key” logs that would trap and retain smaller debris in the system. Reduction of water velocities, deposition of substrates, retention of organic material, creation of pools and increases in aquatic habitat complexity are expected to occur during the first winter following project implementation. Since whole, large diameter trees are targeted for use under the Proposed Action, it is reasonable to expect that the trees would stay at, or near their placed locations for a long period of time, possibly until breakage from decay occurs. In the short and long-term, populations of aquatic organisms would benefit from the changes in the stream channel complexity caused by the addition of the LWD (ACS objectives 4, 6, and 9).

Cumulative Effects: No adverse cumulative effects to the aquatic environment are anticipated from implementation of the Proposed Action. In the Deer Creek drainage, no additional stream enhancement activities on lands managed by the BLM are planned in the near, or foreseeable future. Since the majority of the lands in the drainage are owned and managed by private landowners, it is difficult to predict any actions that may be cumulative to the effects analyzed in the Proposed Action.

4.2.3 Issue # 3 *What are the effects of temporary road closures during project implementation?*

4.2.3.1 Roads

Direct Effects: Through the action of having the tree pulling equipment set up on Rd. 17-3E-9 and the presence of the pulling cables across the road, a safety concern exist for any users of the road. The public access is controlled by the Weyerhaeuser Company gate. A temporary closure of the road would be obtained by closure of the gate, signing of the road, flag persons and coordination of the restoration activities with the legitimate road users. The BLM would be responsible for the closure of the gate, safety signing, flag persons and notification of operational dates. The BLM would do the prior notification to the legitimate road users.

Indirect Effects and *Cumulative Effects*: No Indirect Effects or Cumulative Effects are anticipated because of the design features described in the Proposed Action.

4.2.4 Issue # 4 *What would be the effects of lining trees across the road bed/prism?*

4.2.4.1 Soils

Direct Effects: It is unknown at this time what proportion of the trees would be lined from the stand above the road. Pulling trees across the road has the potential to fill ditches and otherwise disrupt ditch function. Some Hillslope erosion is also expected, but the potential for damage to the roadbed itself is low because the outside edge of the road is typically wide enough (average five feet) to prevent deterioration of running surface. Requiring the use of a “rub log” on all trees lined across the road would lessen soil gouging at the interface of road edge and fill, thereby minimizing the risk of channelization of the Hillslope.

Indirect Effects: Repair of all road damage at time of project completion would prevent plugged ditches and culverts that could lead to fill failures and roadbed damage. Any Hillslope corridors that have the potential for continued erosion or gullying would be treated prior to project closure and before fall rains.

Cumulative Effects: Because of the design features, no cumulative effects are anticipated from the Proposed Action.

4.2.4.2 Roads

Direct Effects: There is the potential for cutslope or ditchline damage along Rd. 17-3E-9 if trees are pulled from upslope of the road. Damage is expected to be minimal, and would be mitigated through the repair of each site to pre-project conditions.

Indirect Effects and *Cumulative Effects:* No Indirect Effects or Cumulative Effects are anticipated because of the design features described in the Proposed Action.

4.4 Other Environmental Effects - Common To All Action Alternatives

4.4.1 Wildlife

Terrestrial and aquatic riparian habitats for most wildlife species would be improved in the short and long term as a result of the proposed action. Some instream benefits would be realized immediately after project completion.

Osprey - Because of the design features of the Proposed Action, no direct or cumulative effects are anticipated.

4.4.2 Threatened and Endangered Species

4.4.2.1 Northern Spotted Owl

Direct, and Cumulative Effects: Because of the design features of the Proposed Action, no direct or cumulative effects are anticipated.

Indirect Effects: Overall riparian habitat conditions would be improved by the Proposed Action.

4.4.2.2 Fisheries

Prior to project implementation formal consultation would be conducted with National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFS) on the potential effects of this action on spring chinook, winter steelhead, and bull trout.

Direct, *Indirect*, and *Cumulative Effects*: Refer to the Effects Analysis for the fisheries resource in 4.1.2.2 (No Action) and 4.2.2.2 (Proposed Action) for potential effects to listed and proposed T&E fish species.

4.4.2 Survey and Manage Species

4.4.2.1 Mollusks

Direct Effects: Limited portions of the habitat in the project area may be temporarily degraded. This temporary effect would be due to disturbance of soil and litter strata, down woody debris, moisture regimes, and temperature. These affects to habitat would be minimal and short term due to the types and amounts of disturbances and the ability of the riparian habitat to quickly recover for mollusks. The in-stream disturbances would not directly affect mollusks.

The 10 detected confirmed sites would receive a 30 foot radius (minimum) no-entry reserve (see project design features). As a result, these sites would be unaffected by the project.

Key habitat features such as down woody debris and hardwoods (especially big leaf maples) would be avoided when operationally feasible.

Indirect Effects: No indirect effects are anticipated for these species.

Cumulative Effects: Evidence from Eugene District surveys since 1995 suggest the three species appear to be well distributed across the Willamette province within District ownership boundaries. Noted differences in relative abundance may be due to survey methods, habitat and biological factors. Populations of these mollusks appear capable of surviving or re-colonizing areas affected by some types of local disturbances. The Proposed Action is not expected to pose a risk to distribution or local abundance of the three mollusk species. Short term effects would be minimal or none and restoration of riparian conditions would improve future habitat conditions for these species.

4.4.2.2 Fungi, Bryophytes, and Lichens

There were no Survey and Manage botany species found in the proposed project area, therefore no direct, indirect, or cumulative effects are anticipated for these species.

4.4.3 Cultural Resources

No cultural resources are known to exist in the proposed project area.

4.4.4 Unaffected Resources

The following are either not present or would not be affected by any of the alternatives: Areas of Critical Environmental Concerns, prime or unique farm lands, flood plains, Native American religious concerns, solid or hazardous wastes, Wild and Scenic Rivers, Wilderness, Minority populations, and lowincome populations.

4.4.5 American Indian Rights

No impacts on American Indian social, economic, or subsistence rights are anticipated. No impacts are anticipated on the American Indian Religious Freedom Act. Management action information is sent to the Confederated Tribes of the Grand Ronde, and Confederated Tribes of the Siletz.

5.0 List of Agencies and Persons Consulted

This Environmental Analysis is being mailed to 21 members of the public and organizations that have requested to be on the mailing list. Additionally, the following is a list of other agency and adjacent landowner representatives that were consulted during the development of this EA.

- Jeff Ziller - Oregon Department of Fish & Wildlife (ODFW)
- Mark Wade - ODFW
- Marianne Reciter - Weyerhaeuser Co. (WEYCO)
- Jim Stark - WEYCO
- Frank Williams - WEYCO
- Jim Hall - Olympic Resource Management, Inc. (ORM)
- Brian Prater - ORM
- Dave Bickford - US Forest Service
- Ramon Riveria - US Forest Service

6.0 List of Preparers

THE INTERDISCIPLINARY TEAM

Each member has reviewed this EA and concurs with its contents.

NAME	TITLE	RESOURCE/DISCIPLINE
Rudy Wiedenbeck	Soil Scientist	Soils
Fred Kallien	Silviculturist	Silviculture
Mark D'Aversa	Hydrologist	Water Resources
Dave Mattson	Engineer	Roads/Transportation
Michael Southard	Archaeologist	Cultural Resources
Cheshire Mayrsohn	Botanist	Botany
Mike Blow	Wildlife Biologist	Wildlife Habitat
Karen Martin	Fisheries Biologist	Fisheries
Mike McKay	Fisheries Technician	Fisheries / EA preparer

Appendix 1

Aquatic Conservation Strategy Objectives

Forest Service and BLM-administered lands within the range of the northern spotted owl will be managed to:

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.

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.

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

4. 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.

5. 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.

6. 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.

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

8. 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.

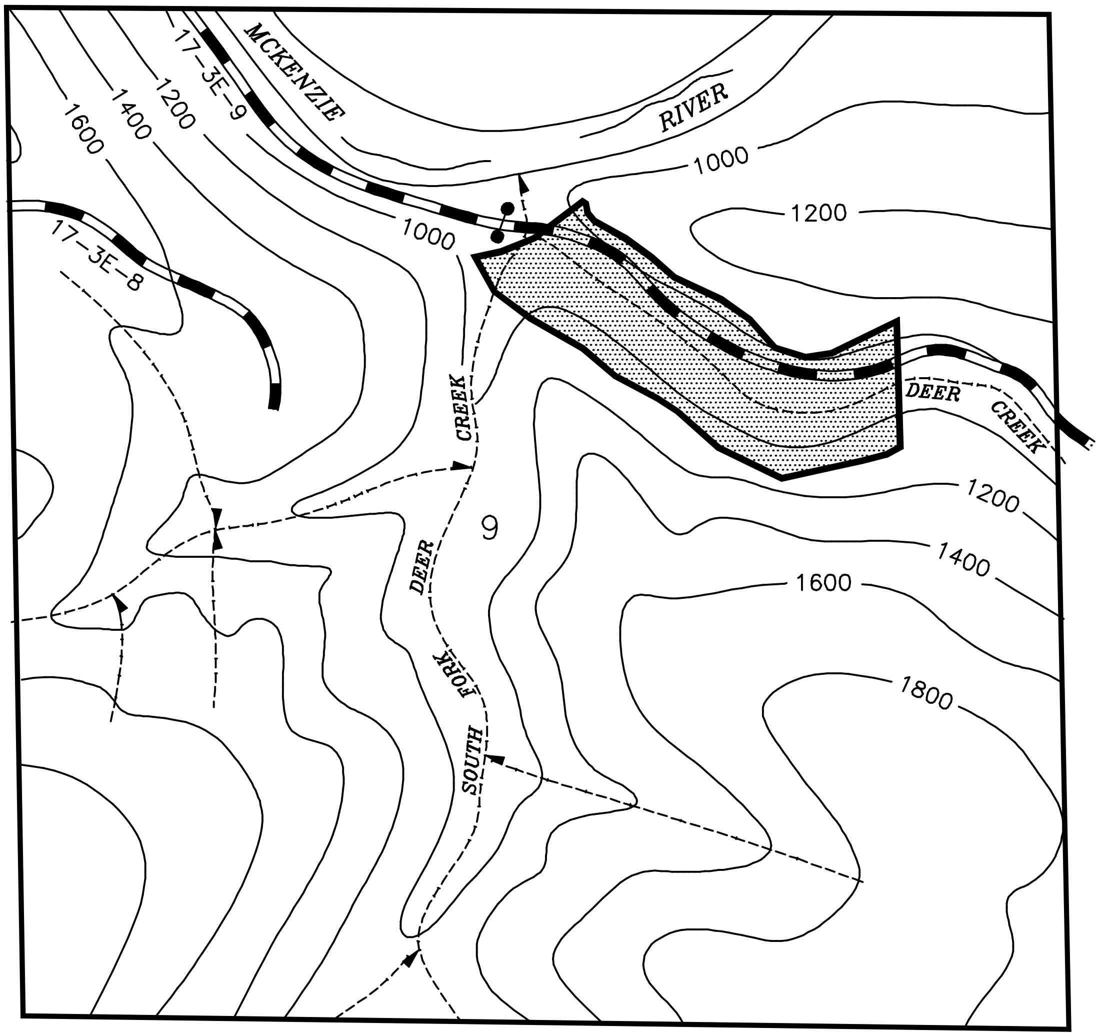
9. Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

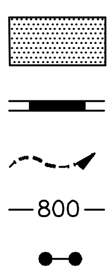
DEER CREEK AQUATIC RESTORATION PROJECT MAP

APPENDIX 2

T. 17S R. 3E SEC. 9



LEGEND



PROJECT AREA BOUNDARY

ROCK SURFACED ROAD

STREAM

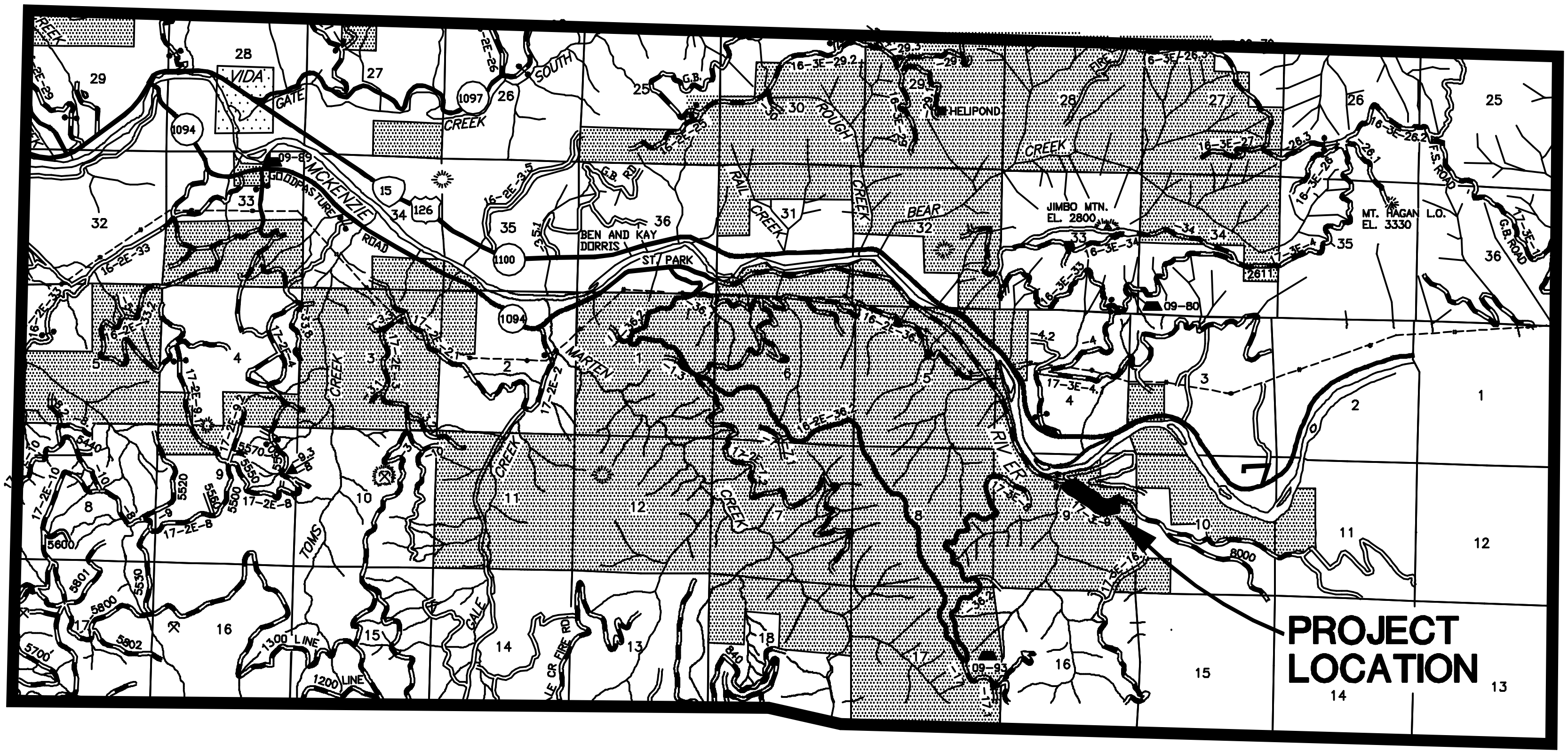
—800— CONTOUR LINES – 200' INTERVALS

GATE

SCALE 1" = 1000'

DEER CREEK AQUATIC RESTORATION PROJECT MAP LOCATION

APPENDIX 3



NO SCALE

Appendix 4
Seasonal Restrictions for Project Work

PROJECT TIMING	
Resource	**Seasonal Restriction**
T&E Wildlife Species - Northern Spotted Owl	Within 0.25 mile of owl activity center - March 1 to June 30. If nesting status is unknown or successful, restrictions could continue until September 30 based on the discretion of the Agency biologist .
Other Sensitive Wildlife - Osprey	Nesting restriction - March 1 to June 30
In-Channel Work	ODFW instream operating period - July 1 to October 15 (unless a project-specific exception is granted after field review by ODFW personnel)

The Finding of No Significant Impact (FONSI) is not a decision document. Its purpose is to state that the actions proposed do not have a significant effect on the environment and that an EIS is not needed according to information contained in the EA and other available information. The unsigned FONSI is sent out with the EA to let you know that we feel that our actions do not warrant an EIS.

UNITED STATES DEPARTMENT OF THE INTERIOR	**1792A**
BUREAU OF LAND MANAGEMENT	**EA-99-05**
EUGENE DISTRICT	**Deer Creek**

Preliminary Finding of No Significant Impact
Deer Creek Aquatic Restoration Project - EA OR 090-99-05

The Interdisciplinary Team for the McKenzie Resource Area, Eugene District, Bureau of Land Management has completed an Environmental Assessment (EA) and analyzed a proposal to conduct aquatic restoration in Deer Creek, a tributary to the Lower McKenzie River. The proposed project area is located in T. 17 S., R. 3 E., Section 9. The proposal would be done in compliance with the Standards and Guidelines of the Record of Decision (ROD) for the Forest Plan.

The primary goal of the proposed project is to restore large down wood to the aquatic and riparian ecosystem along the lower portion of Deer Creek. The issues addressed in the EA concern potential impacts to soil and water quality as it affects aquatic life and humans, and the potential impacts to the use and condition of the road that parallels Deer Creek in the proposed project area.

The design features of the Proposed Action and alternatives are described in the attached Deer Creek Aquatic Restoration EA, FY 99. Anticipated impacts to the environment will not be significant. The Proposed Action and alternatives are in conformance with the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents within the Range of the Northern Spotted Owl* (April 1994), and the *Eugene District Record of Decision and Resource Management Plan* (June 1995).

The anticipated environmental effects contained in this EA are based on research, professional judgement, and experience of the Interdisciplinary (ID) team and Eugene District Resources staff. No significant adverse impacts are expected to: (1) Threatened or Endangered species, (2) Flood plains or Wetlands/Riparian areas, (3) Wilderness Values, (4) Areas of Critical Environmental Concern, (5) Cultural Resources, (6) Prime or unique Farmland, (7) Wild and Scenic Rivers, (8) Air Quality, (9) Native American Religious Concerns, (10) Hazardous or Solid Waste, (11) Environmental Justice and (12) Water Quality.

DETERMINATION

On the basis of information contained in the EA, and all other information available to me, it is my determination that the alternatives analyzed do not constitute a major Federal action affecting the quality of the human environment. Therefore, a new EIS or supplement to the existing EIS is unnecessary and would not be prepared for this proposal.

Approved by:______________________________ Date:____________________
McKenzie Resource Area Manager