ENVIRONMENTAL ASSESSMENT

for the

PARADISE CREEK WATERSHED RESTORATION PROJECT

EA OR125-05-06

Bureau of Land Management
Coos Bay District
Umpqua Field Office
North Bend, Oregon

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Abstract: This Environmental Assessment describes alternatives considered for restoration of aquatic habitat in streams located in the Paradise Creek subwatershed, a large tributary to the Umpqua River west of the town of Elkton, Oregon.

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CHAPTER 1: PURPOSE AND NEED

Introduction

The proposed action is subject to the *Coos Bay District Resource Management Plan & Environmental Impact Statement* (RMP) and its Record of Decision (BLM, 1995) as supplemented and amended; which is in conformance with 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* and its Record of Decision (Interagency, 1994) as supplemented and amended. The RMP has been determined to be consistent with the standards and guidelines for healthy lands at the land use plan scale and associated timelines.

The proposed action is also consistent with the Riparian Reserve Standards and Guidelines of the Northwest Forest Plan, and the Aquatic Conservation Strategy (ACS), and would contribute to restoring the fifth-field watersheds of the project area over the long term. This plan has been reviewed to determine if the proposed action conforms with the land use plan's terms and conditions as required by 43 CFR 1601.5.

The EA analyzes a large-scale instream restoration project on both BLM administered lands and private lands within the Paradise Creek watershed. BLM has established partnerships with the Umpqua Basin Watershed Council, the Oregon Department of Fish and Wildlife (ODFW) and private landowners in support of a watershed-level restoration program to be implemented over a period of one to three years.

Purpose and Need for Action

The Paradise Creek 6th field watershed (USGS Hydrological Unit Code #171003030401) is within the Middle Umpqua River 5th field watershed (HUC # 1710030304). The Middle Umpqua River Watershed Analysis (WA) documents that the majority of the fish-bearing streams within the Paradise Creek subwatershed had naturally occurring wood physically removed from the channels (stream “cleaning”). Historical land management activities including timber harvest, agricultural practices and associated road construction have contributed to the decline of instream and riparian habitats.

The watershed has also experienced a relatively frequent fire return interval, with large portions of riparian areas adjacent to stream channels impacted by fire activity. The cumulative effects of the natural and human-caused activities have resulted in aquatic habitat that is substantially over-simplified and lacking the structural diversity characteristic of healthy stream systems.

The projects proposed in this EA are a direct result of restoration recommendations made in the Middle Umpqua River WA (BLM, 2004) and collaboration with ODFW, the UBWC, and private landowners in the Paradise Creek watershed. The primary purpose of the projects is to aid in the restoration of instream and riparian habitats by the placement of large wood in selected fish-bearing stream channels, and placing boulder structures in bedrock-dominated stream reaches where wood placement is impractical or not approved by private landowners.

The need for the projects stems from the fact that, without active restorative treatments of the impacted stream channels, degraded habitat conditions would remain well below desired levels of instream structure for the foreseeable future. This situation is not desirable due to the numerous aquatic species throughout the region that have experienced dramatic population declines over the past several decades. In the proposed project area, coho and chinook salmon, steelhead and cutthroat trout, and lamprey (brook and Pacific) are expected to benefit in both the short- and long-term.

Additional Direction

The Paradise Creek watershed is designated as a Tier 1 Key Watershed. As stated in the Record of Decision (ROD) for the North West Forest Plan (BLM, 1995) as supplemented and amended, Tier 1 Key Watersheds contribute, or have the potential to contribute directly to the conservation of at-risk anadromous salmonids and resident fish species. Key watersheds also have a high potential for being restored as part of a watershed restoration program and are considered to be the highest priority for watershed restoration (ROD, page B-19). To succeed, strategies must strive to maintain and restore ecosystem health at watershed and landscape scales (Forest Ecosystem Management Assessment Team, 1993).

Further direction for habitat improvement projects in Late Successional Reserves (LSR's) is provided on page C-17 of the ROD, which states that projects "designed to improve conditions for fish, wildlife, or watersheds should be considered if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible. Projects required for recovery of threatened or endangered species should be considered even if they result in some reduction of habitat quality for other late-successional species."

Desired Future Conditions

The desired future condition for large wood in fish-bearing stream channels in the Paradise Creek watershed is to have a minimum of approximately 50 pieces per mile in locations where it is feasible to achieve such conditions[1]. This figure is based upon recommended values for large wood in streams, and stream survey data collected in streams minimally affected by timber harvest and road construction in the Pacific Northwest. Boulders also provide important channel roughness and habitat features for fish and other aquatic-dependant organisms, but baseline conditions for the abundance of boulders in the project area are unknown.

[1] The National Oceanic and Atmospheric Administration considers the proper functioning condition for large wood to be a minimum of 50 pieces/mile, 24" diameter, 50' in length. However, logs of this size are difficult and costly to obtain and/or place in stream channels under most circumstances. For the purpose of this EA, large wood is considered to be a predominance of pieces that are twice the active channel width without a rootwad, and 1 ½ times the channel width for pieces with a rootwad. The diameter of logs proposed for placement will be as large as practicable, given the constraints of log sources and funding.

Environmental Setting

The project area is located in the BLM Coos Bay District, Umpqua Field Office, approximately 8 miles to the northwest of the town of Elkton, Oregon. The proposed treatment areas are located on both public and private lands on Paradise Creek, tributaries to Paradise Creek (Cedar Creek, House Creek and Bear Wallow Creek), and Little Paradise Creek. The watershed, project stream reaches, ownership, and structure placement methods are shown in Figure1 below.

The legal locations for the drainages proposed for instream restoration in the watershed include the following (all are Willamette Meridian):

Stream Name	Township (South)	Range (West)	Section(s)
Paradise Creek	21	07	30
	21	08	25, 35 & 36
	22	08	2, 3, 9 & 10
Little Paradise Creek	21	07	6
	22	08	1, 11, 12 & 14
House Creek	21	08	27 & 34
	22	08	2
Bear Wallow Creek	21	08	26 & 35
Cedar Creek	21	08	33 & 34
	22	08	3

The proposed action is for the Coos Bay District BLM to place up to approximately 500 conifer logs and whole trees in fish-bearing stream reaches throughout the Paradise Creek watershed in cooperation with private landowners, the UBWC, and ODFW. Boulder structures would also be placed in locations where the mainstem channels are too wide for conventional log placements, and/or where private landowners have concerns about the potential for logs to impact their lands. A total of up to approximately 12 miles of fish-bearing streams would be enhanced throughout the watershed, with an average of about 50 logs per stream mile in stream reaches where logs and whole trees would be placed.

The only practicable method for the placement of logs in stream reaches lacking road access is by helicopter. Utilizing a large helicopter would also enable the placement of large logs (>50' in length) with or without root wads. Where there is road access adjacent to streams, logs would be placed by cable yarding methods and/or utilizing heavy equipment such as an excavator. Boulder placements would also be accomplished by an excavator or similar heavy equipment, and dump trucks would deliver boulders and gravel to the placement sites.

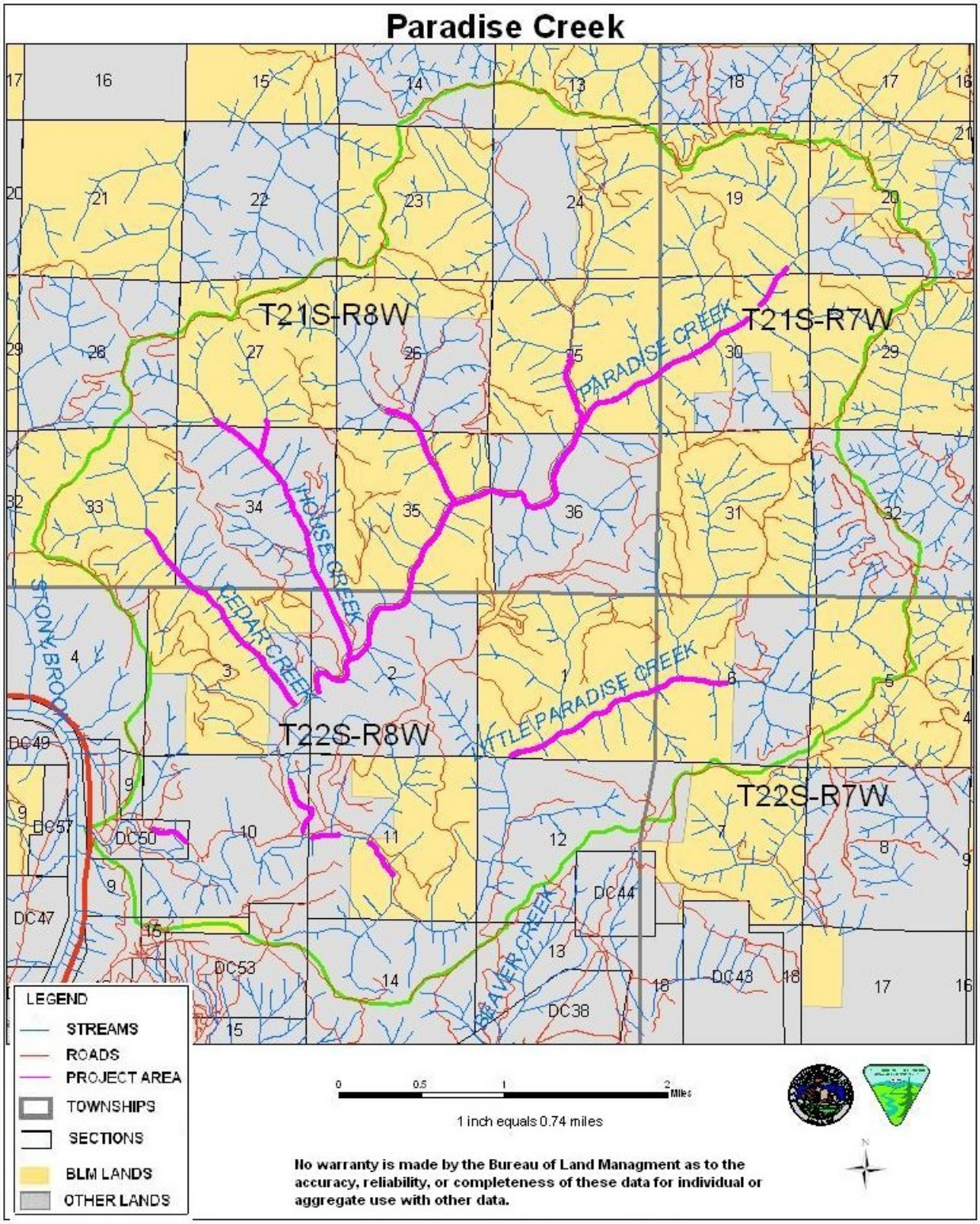

Figure 1 Paradise Creek Watershed. Stream reaches, project areas and ownership.

Proposed Action

Scoping

Scoping is a process used to surface issues. Public scoping for the Paradise Creek Restoration Project began when letters were sent to adjacent landowners and interested agencies, organizations and individuals in late January, 2005, and posted on the Coos Bay District internet site on January 26, 2005. Public scoping closed on March 1, 2005. Internal scoping for the project began with an interdisciplinary team (IDT) meeting on February 7, 2005.

During the public scoping period, only one comment was received from the public. A private landowner in the Paradise Creek watershed inquired about the scope of the project, and if instream restoration (structure placements) was planned for their property through the proposed project. The landowner was informed that there were no plans to include their property, and instream restoration would occur only where landowners have granted specific approval.

Issues Analyzed

1) Potential effects on aquatic and riparian habitat

The addition of large volumes of large wood and boulders to stream channels has the potential to substantially alter aquatic and riparian habitats in a very short period of time. While the majority of these changes are believed to be beneficial, there is the potential to have what could be perceived as negative influences on instream and riparian habitats in the short-term. These negative impacts could include localized ground disturbance and streambank erosion, loss of some shade-providing trees near stream channels, and direct and indirect disturbance of fish and other aquatic and riparian species.

2) Potential effects on Special Status Species

Some disturbance of special status fish populations in the project area would be unavoidable during structure placements. Because of the nature of the work involving equipment use in the stream channel, some individuals may be injured or killed during the course of the work, but appropriate measures described below would be taken to minimize the potential for take or harm to occur. As stated in the incidental take statement of the National Oceanic and Atmospheric Administration (NOAA) Fisheries Programmatic BO, it is anticipated that certain actions are reasonably certain to cause incidental take, and the effects of the actions are largely unquantifiable and are not expected to be measurable as long-term effects on population levels. Take that is incidental to, and not intended as part of, the agency action is not considered prohibited, provided that such taking is in compliance with the terms and conditions of the incidental take statement.

The physical ground disturbance caused by the placement of large logs with a helicopter may also impact sensitive plants that could be in the area, and the noise generated by the large helicopter may disturb wildlife, including the northern spotted owl. For more details on these potential impacts, see the Affected Environment chapter below.

Note: These issues were analyzed due to the importance of this information to the decision making process, and the concerns with these issues were resolved by adjusting the timing of the projects, the relatively short-term scope of the impacts, and the long-term benefits to aquatic and riparian species.

Other Issues: Some issues raised during scoping were determined to be non-significant issues as described in the NEPA - CEQ regulations, and will not be used to generate alternatives to the proposed action. The rationale for resolving issues is explained below.

Potential effects to roads, bridges or private lands adjacent to or downstream from the treatment areas.

At issue is the potential for the instream portion of this project to impact transportation structures or private lands adjacent to or downstream from the proposed treatment areas. The placement of instream structures could also cause stream channels to shift over a period of time. In several locations proposed for log placements there are roads located within close proximity to active channels or floodplain areas.

Bridges and large culverts located downstream from proposed instream treatment areas are also found at several locations in the Paradise Creek watershed. During a large flood event, it is possible that some of the large wood added to the channel could be washed downstream. If this were to happen, there would be a risk of this wood damaging the bridges or large culverts found below the treatment areas.

Resolved – Although the potential would exist for a large flood event to transport wood over considerable distances and possibly damage a stream crossing structure (bridge or culvert) the following precautions and design features are expected to considerably reduce the likelihood of such an event occurring.

- All transportation structures that could potentially be at risk would be evaluated by the appropriate engineering and/or hydrology staff. The bridge over Little Paradise Creek has withstood flood events and the passage of large wood for over 50 years. The bridge over Highway 38 near the confluence of Paradise Creek and the Umpqua River is of sufficient elevation and width to pass large log jams.

- The logs to be placed within stream channels would be in accordance with Oregon's instream restoration guidelines (i.e., the preponderance of logs without a rootwad would be 2 times the active channel width, and those with a rootwad would be at least 1 ½ times the active channel width). Studies have shown that most mobile pieces of wood are shorter than bankfull width, and pieces tend to be stable when piece length is greater than bankfull width in smaller rivers (Braudrick & Grant, 2000).

- To further minimize the potential for logs to be transported downstream to private agricultural lands, no log placements would occur below the confluence of House Creek and Paradise Creek (Section 2, T. 22 South, Range 8 West), and only whole conifer trees (exceeding 100 feet in length with rootwad attached) would be placed at the lower end of the wood placements to aid in the retention of wood from upstream locations.

- In streams with culverts at road crossings (Cedar Creek, House Creek and Bear Wallow Creek, log complexes incorporating large key pieces would be created upstream of the culverts to aid in the entrapment of wood transported from reaches further upstream.

- In incised channels in the lower mainstems of lower Paradise Creek and Little Paradise Creek, only boulder structures would be utilized because of the difficulty in assuring that logs would remain stable during flood events.

Issues eliminated from further study

- Energy Development: Energy development and accessibility would remain unchanged from its current condition because there are no road closures associated with any of the alternatives.

- Air Quality: There is no burning associated with this project and there are no other aspects of the project likely to impact air quality.

- Wild & Scenic Rivers/Wilderness: Paradise Creek is neither a Wild & Scenic River nor designated Wilderness.

- Farmlands, Prime Unique: The vicinity of the Paradise Creek project is not considered to be prime nor unique farmland.

- Port Orford cedar: The project area is located north of the range of Port Orford cedar.

CHAPTER 2: ALTERNATIVES CONSIDERED

Alternatives Considered in this Analysis

The National Environmental Policy Act requires the analysis of a proposed action, a reasonable range of alternatives to the proposed action, and a no action alternative. The no action alternative also provides a baseline for estimating environmental effects.

Alternative 1 (No Action)

No instream restoration projects would be implemented in the Paradise Creek watershed on BLM-administered lands. Instream restoration on private lands could possibly still occur, but without BLM's participation as a contributor to funding or materials.

Alternative 2 (Proposed Action)

This alternative proposes to add up to approximately 500 pieces of large wood to a cumulative total of up to 12 miles of stream channel in the Paradise Creek watershed on both public and private lands[2]. Up to 20 boulder structures (consisting of primarily full-spanning boulder weirs) would also be placed in the lower mainstems of Paradise Creek and Little Paradise Creek. Approximately half of the boulder weirs would have spawning gravel placed on the upstream side in order to provide quality spawning habitat in the short-term.

Instream wood placement designs would include a combination of log jam creations as well as isolated log groupings throughout the treatment areas. In general, smaller channels would incorporate fewer logs per grouping than mainstem channels, and mainstem channels on Paradise Creek and Little Paradise Creek in forested areas would receive larger logs, including key pieces with rootwads attached, as well as whole trees on private lands.

Wood Sources: The logs to be placed in streams throughout the watershed would originate from several sources. The majority of logs would originate from private sources (in-kind contributions and purchased) while up to 200 trees would originate from Late Successional Reserve (LSR) on BLM-administered lands in the Paradise Creek watershed. The trees and logs from BLM lands would originate from the perimeter of existing large clearings around established fire ponds in section 24, T. 21 S., R. 8 W., and section 1, T. 22 S., R. 8 W., Willamette Meridian, and adjacent to existing BLM roads throughout the watershed. Three existing down logs near the stream channel in lower Little Paradise Creek would also be cable yarded directly into the stream channel.

The source sites for trees on BLM lands range from 30-79 years of age from currently dense stands which are planned to be thinned within approximately 5 years to aid in the development

[2] All estimates of quantities of large wood and boulder structures are based upon the best information available at the time of the analysis. Because the majority of the work would be accomplished under contracts, and funding limitations could influence the final outcome, the quantities stated throughout the document are approximated.

of late successional characteristics. At present, the stands have a stocking density of approximately 220 trees per acre (tpa). Removal of some of the trees for instream structure placement would maintain stocking densities in the source sites to no less than an average of 175 trees per acre, and the source areas will most likely be thinned again through a timber sale in the future.

Because of the need for large, key pieces of wood for the wide mainstem stream channels, approximately 50 trees would be pulled over with a cable system in order to keep the entire root mass (rootwad) intact. These trees would be cable yarded until the root systems are free of the ground and made accessible to a helicopter. Some of the felled trees would be bucked into log lengths suitable for the stream channels where they would be placed. Trees adjacent to roads would be yarded to the road and loaded onto equipment for transport to designated placement sites and to locations where they would be accessible to a helicopter. In all cases, the tops of trees not used for placement would remain on site to contribute to coarse wood for terrestrial wildlife. The following table shows the origin of the approximate numbers of logs on BLM lands and their disposition for subsequent placement in fish-bearing streams.

Origin	Trees to be pulled over	Trees to be cut	Total
Little Paradise Creek Fire Pond	40	85	125
Paradise Creek Fire Pond	10	65	75
Totals	50	150	200

Up to 30 conifer trees less than 70 years of age, primarily Douglas-fir, originating from BLM lands adjacent to existing roads in the Paradise Creek watershed would be sold to the UBWC or ODFW through a negotiated timber sale, specifically for the purpose of providing long logs (≥50 feet in length) to be used for restoration in the project area. The timber would be cruised by BLM, sold at fair market value at the time of the sale, and the purchaser would be responsible for the logging costs and transportation of the logs to their destinations on private lands in the watershed. Logs purchased for instream placement would be hauled to the project sites near existing roads or landings, off-loaded, and staged for placement by equipment during the instream work period. The delivery of logs from outside sources could occur up to several months prior to actual placement.

On private lands, approximately 30 conifers and some alder adjacent to the mainstem of Paradise Creek near the confluence with House Creek would also be pulled over or felled into the stream channel. Whole trees would be utilized to create highly stable log jams that would further reduce the potential for wood to be transported downstream during flood events.

<u>Boulder and Gravel Sources</u>: Boulders and spawning gravel utilized for instream restoration would be obtained from private sources, or potentially from existing quarries on BLM lands. Boulders would be of sufficient size to be stable during high flows. The gravel would be "bar run" river gravel/cobble suitable for spawning use by adult salmon, with a gradation of approximately 4" maximum to a ¾" minimum, and composed of hard, durable particles. The Coos Bay District has placed spawning gravel on boulder structures at two locations in the mid-1990's, and the sites were used by spawning salmon and steelhead the first fall following placement, and have been used for spawning every year since placement.

Methods: The placement of large wood, boulders and gravel into the stream channels would be accomplished by helicopter and heavy equipment. Due to the large scale of this project, the work would be completed in phases over a period of one to three years, although the work may be accomplished in one year.

A helicopter would be used to place logs where there is no road access and to place large key pieces of wood in mainstem channels where logs greater than approximately 50 feet in length are needed. Log placement by helicopter would also require felling some streamside alder to provide visibility and safety for the pilots and ground crews while placing the logs. All cut trees would be left on site.

The placement of logs by means other than helicopter would be accomplished by heavy equipment such as an excavator which would work directly in and adjacent to stream channels, and/or cable-placed utilizing a yarding system operating from existing roads. Because the work would be awarded through a competitive bid process, the equipment to be used would not be known until the contract is awarded. For this reason, both ground-based log placement methods are analyzed in this EA.

Alternatives Considered, but Eliminated from Further Analysis

The placement of logs was considered in the lower mainstem channels of Paradise Creek and Little Paradise Creeks on private lands, but was eliminated from further analysis because of the difficulty of ensuring the stability of logs in the wide (approximately 25' active channel width) and incised channels[3]. Private landowners have also expressed concerns about impacts to their streambanks from logs that could be transported downstream during high flow events.

The majority of logs in these wide channels would need to be a minimum of 50 feet in length to meet Oregon's guidelines, but the incised bedrock-dominated stream channels lack sufficient roughness and channel constrictions to ensure wood stability, even for logs twice the length of the channel width. For example, in the 1990's, logs were placed in the mainstem of Paradise Creek above the confluence with Little Paradise Creek, but a significant number of the logs were washed downstream during high flow events in subsequent years, despite the use of steel cable securing some of the logs. Although some of the logs remain at this time, experience has shown that stream channels of this size and condition are difficult to restore through conventional log placements. For these reasons, boulder structures were determined to be the most suitable option for providing stable structures, and would be acceptable to the private landowners willing to participate in the cooperative project.

[3] Incised stream channels have fewer areas of functioning floodplain that are capable of dissipating high flow energies.

Best Management Practices, Management Requirements, and Mitigation Measures

The following apply to the action alternative unless otherwise specified.

- If potential cultural resources are encountered during the course of this project, all work in their vicinity shall stop and the District Archeologist shall be notified at once.

- Impacts to Threatened, Endangered, or Special Status plant and animal species would be minimized as described below under Environmental Consequences for the proposed action.

- Any identified wetlands shall be protected from soil disturbance according to RMP standards.

- Riparian canopy removal of hardwoods would be kept to the minimum necessary to ensure safety and efficiency of log placements by helicopter. Trees felled to accommodate log placements would remain on site.

- Equipment access points would be kept to the minimum necessary to accomplish the work in a safe and efficient manner, and existing down wood and riparian vegetation would be protected to the extent practicable. Where the option is available and no pre-existing access is available, the closest access to the stream from the road prism would be utilized to minimize travel distance over undisturbed soils.

- All areas of ground disturbance caused by the movement of logs and/or ground-based equipment within 75 feet of a stream channel would be seeded and mulched as necessary to stabilize soils prior to the rainy season (before October). Straw used as mulch would be certified as weed free.

- Equipment access footprints would not create linear connections from road to stream by placing water-bars and/or ripping the footprint where necessary.

- If possible under the contract, water-bar the Bear Wallow Creek Road to divert surface flow from the tire tread.

- The most restrictive moisture limitation of 10 % soil moisture would be used when accessing outside the road prism. If access is necessary in soil moistures beyond 10 percent, the soils would be de-compacted if needed.

- If a cable system is used to yard logs into stream channels, establishing tailholds and intermediate blocks would be necessary to facilitate the movement of logs. To minimize the potential for damage to streamside trees, straps would be required to protect them from injury.

- Logs placed above culverts would be sized in accordance with ODFW requirements to minimize the potential for them to migrate to the culverts and block the inflow. If there is risk to blocking the culvert, consideration would be given to ending the project at the down-stream side of the culvert.

- Instream restoration work would occur during periods approved by the Oregon Department of Fish and Wildlife.

- Timing restrictions for all structure placements would be established to minimize impacts to marbled murrelets and northern spotted owls where applicable.

- Helicopter service and fueling operations would be located where there is no potential for spills of hazardous materials to aquatic resources.

- Standing trees selected for placement in stream channels would be pulled over or felled in a manner to minimize damage to the residual stands.

- Separate NEPA analysis would be required if BLM-managed quarries are utilized for extraction related to this project.

- To mitigate the introduction or spread of noxious weeds all heavy equipment/machinery would be washed prior to entering BLM lands.

- Sites proposed for treatment shall be screened for recognized environmental conditions (REC's) by project personnel whenever possible, and any concerns documented on the NEPA Level 1 Site Survey, or Hazardous Materials Site Report (Form OR 120 1703-1), and submitted to the District Hazardous Materials Coordinator for investigation or response. These provisions do not apply on private lands, except as potentially affecting BLM lands.

- A Spill Control and Countermeasures Plan (SPCC) conforming to the standards of OAR 340-108 is required. The SPCC shall also correlate to the Coos Bay District Hazardous Materials Contingency Plan and the District Spill Plan for Riparian Operations (as applicable).

- Included in the SPCC and District plans is the requirement for an Oil Spill Kit to be onsite during operations. The contents and use of the Spill Kit, which should be suitable for 50 gallons of petroleum containment consistent with heavy equipment operations, are to be detailed in any contract provisions resulting from this alternative. Notification and response processes are also detailed in the District plans.

- The proposed action would be subject to State of Oregon Administrative Rule No. 340-108, Oil and Hazardous Materials Spills and Releases, which specifies the reporting requirements, cleanup standards and liability that attaches to a spill or release or threatened spill or release involving oil or hazardous substances.

- The Coos Bay District Hazardous Materials Contingency Plan and Spill Plan for

Riparian Operations apply when applicable to operations where a release threatens to reach surface waters or is at or in excess of reportable quantities.

Monitoring

- Instream habitat inventories were conducted on the Paradise Creek watershed during the summer of 2004. This information will serve as the baseline to compare with future inventories expected to be conducted within 5 years of project implementation. Due to the large scale of the project, watershed-level inventories are necessary to document habitat changes through time.

- ODFW has conducted mass spawning surveys in Paradise Creek since 1998 for coho salmon. Surveys conducted after project work has been completed would document changes in spawner abundance, and their utilization of placed structures.

- Photo points would be established to document habitat changes at selected sites.

CHAPTER 3: AFFECTED ENVIRONMENT

This chapter describes the resources which stand to be affected by the proposed action, including those which form the key issues, and the effects of implementation.

Beneficial Uses

The beneficial uses of the Paradise Creek watershed are anadromous and resident fisheries, other aquatic life, wildlife, aesthetic quality, forest management, and agriculture. All stream reaches identified for proposed channel restoration are fish-bearing. Fish species and distribution have been described in detail in the Middle Umpqua River Watershed Analysis (BLM, 2004).

Fisheries Values

The Paradise Creek watershed contains close to 20 miles of fish bearing streams, with the majority accessible to coho salmon and steelhead trout. Some headwater areas above the range of anadromous salmonids are occupied by resident cutthroat trout. The range of searun cutthroat trout probably overlaps that of coho salmon. Approximately 2.5 stream miles in lower Paradise Creek and Little Paradise Creek are known to be utilized for spawning by fall chinook salmon, but surveys conducted by ODFW indicate that their production is highly limited due to the predominance of bedrock substrate.

The Umpqua squawfish, largescale sucker, red-sided shiner and three-spined stickleback are also believed to occur in the lower mainstem of Paradise Creek, and several sculpin species probably occur throughout the watershed. Speckled dace are believed to occur over much of the range of coho in low-gradient reaches below natural barriers. Although the range of Pacific and brook lamprey and is not known, they probably inhabit much of the range of the salmonid species.

Special Status Aquatic Species

At the time of the preparation of this document, Oregon Coast (OC) steelhead trout were listed as a "Species of Concern" and OC coho salmon as a Candidate species by the National Oceanic and Atmospheric Administration Fisheries (NOAA). The proposed project is covered under the October 18, 2002 Programmatic Biological Opinion (BO) (2002/00879) from NOAA fisheries authorizing certain "Likely to Adversely Affect" activities affecting Oregon Coast (OC) Coho Salmon, and OC Steelhead. Consultation for Essential Fish Habitat[4] (EFH) as required by the Magnuson-Stevens Fishery Conservation and Management Act was also completed with the issuance of the BO.

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[4] Essential Fish Habitat means those waters and substrate necessary to fish for spawning, breeding, feed, or growth to maturity. In the project area, EFH for coho and chinook salmon consists of their range of distribution in the Paradise Creek watershed.

A biological evaluation for aquatic special status species (SSS) completed for the proposed project is included at the end of the Environmental Consequences chapter below. The table lists the aquatic SSS present on Coos Bay District lands, and the species or their habitat that are present in the action area.

Existing Aquatic Habitat Conditions

Historical instream restoration projects that have been implemented in the past in the watershed were limited to mainstem Paradise Creek and lower Little Paradise Creek. The earliest known project on BLM lands, which occurred in 1986, consisted of boulder weir placements on approximately 1 stream mile, with some woody debris (rootwads and small conifers) added in the mid-1990's to serve as cover habitat. Several instream restoration projects were also implemented on private lands in the watershed in the 1990's. These include boulder/log combinations in the upper reaches of the mainstem above Bear Wallow Creek, log placements (some secured by cable) above the confluence with Little Paradise Creek and in lower Little Paradise Creek, and a small number of boulder structures placed in the mainstem of Paradise Creek about ½ mile above the Umpqua River. Although habitat inventories and spawner surveys have shown that these projects have improved instream habitat conditions (in comparison to untreated reaches), they encompass less than 20% of the fish-bearing stream miles in the watershed, and they were located primarily in larger stream channels dominated by bedrock substrate. In addition, as described in Chapter 2 above, a significant number of the logs that were placed in the lower mainstems were washed downstream during subsequent high water events, despite the fact that many of the logs were secured with cable.

ODFW conducted aquatic habitat inventories in the Paradise Creek watershed during the summer of 2004, but the results of the inventories were not summarized or available to BLM as of the time this EA was prepared. As such, stream habitat inventories from 1994 and 1996 represent the best available information. For detailed information concerning aquatic habitat conditions, refer to the Middle Umpqua River Watershed Analysis (WA) (BLM, 2004).

Coarse stream substrate contributes to the structure of both the micro- and macro-habitat features for rearing, spawning, incubation, migration and holding of fish and other aquatic organisms (Angelo and Rosenau, 2000). However, stream substrate throughout much of the Paradise Creek watershed is of poor quality for salmonids and other aquatic-dependant species. The mid-1990's stream habitat inventories showed that approximately 50% of the mainstem of Paradise Creek is dominated by bedrock substrate and gravel represents only 20% of the substrate on riffles. Lower Little Paradise Creek was 66% bedrock, although generally shallow gravel substrate on riffles was around 28% in the upper reaches. The headwater areas and some of the tributaries to Paradise Creek (House Creek, Bear Wallow and Cedar Creek) have a higher component of gravel substrate on riffles (~30%-50%), but much of the substrate is shallow and unstable due to insufficient structure necessary for retaining deep and stable substrate. The quality and abundance of each habitat is determined by the depth, velocity and substrate composition and, to some degree, each of these parameters are interdependent with one another (Angelo and Rosenau, 2000). However, the preponderance of bedrock and shallow gravel in the watershed indicates that productivity for aquatic-dependant species is not favorable.

Large wood is an extremely important element in helping create and maintain fish habitat diversity, especially in coastal streams in the Pacific Northwest. Coho salmon favor pools formed by large wood for rearing and large wood can help increase pool frequency and coho salmon production (Cedarholm et al., 1997). Poole and Berman (1999) found that large wood may also help with stream cooling by forcing more stream flow into shallow ground water. NOAA Fisheries considers the properly functioning condition for large wood in western Oregon to be a minimum of 50 pieces per mile, 24" diameter and 50' in length. In the Paradise Creek watershed, the current condition is substantially less than this in virtually all fish-bearing stream reaches. For example, habitat inventories from the mid-1990s show that there were only 7 key pieces of wood[5] in the entire lower 3.7 stream miles of Paradise Creek. In the lower 2.5 miles of Little Paradise Creek, there were only 3 key pieces of wood. The potential to attain wood levels approaching desired conditions in the foreseeable future is extremely low in the absence of active restoration efforts.

Stream Channels, Flood Plains, and Water Quality

The 4th, 5th, and 6th order stream reaches proposed for treatment are classified as B, C, and F stream types according to the Rosgen (1996) classification system. B type channels typically contain steps formed by large wood and boulders that dissipate stream energy and maintain channel stability. C type streams are characterized by a meandering, riffle-pool channel with a well developed floodplain. The F stream type is similar to the C type, but is vertically lowered and disconnected from the floodplain.

Many stream reaches within the proposed action area have experienced riparian and in-stream habitat degradation as a result of past management activities. Valley bottom roads have encroached on C channel floodplains leading to a reduction in cross-sectional area and a corresponding increase in high flow velocities. Meanders, which increase resistance to flow and reduce channel gradient relative to a straight reach, have been lost or truncated by roads that restrict natural lateral channel migration. Roads crossing and paralleling streams have also restricted sediment and wood transport from upstream and upslope source areas.

The loss of large wood in and adjacent to all stream types together with the road effects noted above have increased channel down-cutting and widening and reduced habitat complexity. In some cases, higher flows no longer spill onto floodplains and this concentrates erosive power at the bed and high banks of the entrenched or vertically confined channels.

Morphological changes in the proposed action streams have altered flow magnitude and timing. In the past, abundant large wood produced low gradient, depositional reaches with channels that were narrower, deeper, and connected to the floodplain. Beaver dams and log jams played a larger role in moderating peak flows and storing surface and subsurface water in-channel for gradual release during the summer low flow period. Down-cutting, widening of the stream, and the loss of complexity have greatly diminished water storage capacity in the channel. The subsurface water storage capacity of adjacent terraces has also been reduced.

[5] ODFW's standard for a "key piece" of wood is 32.8 feet in length by approximately 2' in diameter.

Morphological changes have also increased the stream's susceptibility to heating. In addition to the loss of water storage capacity, forest management activities have lead to increased width to depth ratios. A wide, shallow stream receives more energy (and therefore increases in temperature faster) than a stream of the same volume that is narrow and deep.

In 1994 and 2001, Bureau of Land Management personnel collected continuous water temperature information within the Paradise Creek drainage at eight and ten federally-managed sites respectively. The data show the characteristic pattern of heating in the downstream direction, and indicate that water temperatures are generally at or below the State's stream temperature standard for salmonid rearing.

Currently, two reaches within the proposed action area are listed in the Oregon Department of Environmental Quality's (ODEQ) water quality limited streams database. Paradise Creek (river mile 0 to 8.3) and Little Paradise Creek (river mile 0 to 5.1) are both listed as water quality limited due to habitat modification. Because the impairment is not caused by a pollutant, a comprehensive plan to improve water quality (i.e. Total Maximum Daily Load) is not required by the ODEQ.

Geology and Soils

Geology

The project areas are located in the Tyee sedimentary basin. The stratigraphy of the restoration the project includes members of the Tyee Formation. All of the units are sedimentary sandstone, siltstone, and mudstone, exhibiting characteristics attributed to Tyee Formations.

Associated hazards of the Tyee Formations, and those similar in lithology, include: rapid erosion, flash flooding, rapid mass movement, and stream bank erosion. The type of failure is determined by steepness of slope, angle of stratigraphy dip, combination of stratigraphy type, moisture, and disturbance. Certain units within the project area are mapped with a 10° to 15º dip to the south. However, not all geologic structure has been mapped.

No faults were identified within the project area. A large Quaternary landslide is north of the project. A south oriented syncline is east of the project, with the Little Paradise Creek portion of the project crossing it.

Soils

The soils within the project are derived from the Tyee Formation. They include:

- Chapman-Chehalis Complex, 0%-3% Slopes
- Digger-Bohannon-Umpcoos Complex, 60%-90% Slopes
- Digger-Preacher Complex, 60%-90% Slopes
- Honeygrove Gravelly Clay Loam, 3%-30% Slopes
- McDuff-Absaquil-Honeygrove Complex, 30%-60% Slopes
- Preacher Loam, 0%-30% Slopes

- Preacher-Bohannon Complex, 3%-30% Slopes
- Preacher-Bohannon-Digger Complex, 60%-90% Slopes
- Preacher-Bohannon-Xanadu Complex, 30%-60% Slopes
- Roseburg Loam, 0%-3% Slopes

The range of maximum allowable soil moisture for ground-based operations is 10 percent to 20 percent, based on the plastic limits of individual soil members.

Existing Riparian Conditions

In the watershed a total of 3,846 acres are classified as riparian reserve (federal lands), which represents approximately 55 percent of the public land base. Roughly 26.5 percent of this acreage is over 80 years of age. For all lands in the watershed, approximately 73.5 percent are less than 80 years of age or in a non-forested condition. These age classes are inadequate for providing the sizes of wood necessary for the development of diverse aquatic habitat in the foreseeable future.

Based on riparian vegetation inventory information, numerous reaches have been identified as having a red alder-dominated overstory canopy, the majority of which is believed to be the result of human disturbance activities. It is estimated that approximately 595 acres of red alder-dominated riparian canopy exists throughout the watershed, and the canopy closure averages 37 percent. Based on aerial photo interpretations and surveys, there are relatively few areas where trees greater than 80 years old occur near fish-bearing streams.

Late Successional Reserve

As described above, approximately 200 trees would be removed from LSR in the Paradise Creek watershed for placement in stream channels under the proposed action. The currently dense stands (about 220 tpa) would be impacted minimally by the removal of some Douglas-fir, and more than 175 tpa on average would remain in the source sites adjacent to existing roads and the fire ponds after the removal of trees selected for placement in streams. Because the stands will likely be thinned to approximately 80 tpa or less within the next several years, the number of trees removed for placement in streams would constitute a minor component of the existing timber stands.

Wildlife

Special Status Wildlife Species

There are six known spotted owl nest sites within the project area. Two of the owl sites were active in 2004. Much of the project area is within 0.5 miles of suitable marbled murrelet habitat. Surveys have not been conducted, so occupancy by murrelets is unknown. There are no known bald eagle nest sites, roosts, or habitual perches in the project area.

Several other special status wildlife species are suspected to occur in the project area due to the presence of potential habitat. The Special Status Wildlife Species table located at the end of the Environmental Consequences chapter identifies which species are suspected to have habitat and may occur within the proposed project area. Surveys are not currently required for any special status species, and have not been conducted. No known sites of any special status wildlife species occur within the proposed units.

Port Orford Cedar

The proposed project area is outside the natural range of Port-Orford-Cedar (POC) and no POC is known to exist in the project area.

Noxious Weeds

Noxious Weeds known to be within the project area include: Scotch and French brooms, Himalayan Blackberry, and various thistles. The majority of these weeds are present where disturbance has occurred and sunlight is plentiful (i.e. mostly along road edges). The roads in this area were treated for Scotch and French brooms 2 years ago, therefore, most mature plants are dead but some sprouting of seedlings is evident. While tansy ragwort can be present it is considered to be continuously controlled by biological agents, and is not generally of concern.

Environmental Justice

The proposed area(s) of activity are not known to be used by, or disproportionately used by, Native Americans, and minority or low-income populations for specific cultural activities, or at greater rates than the general population. This includes their relative geographic location and cultural, religious, employment, subsistence, or recreational activities that may bring them to the proposed area(s). Also, BLM concludes that no disproportionately high or adverse human health or environmental effects will occur to Native Americans, and minority or low-income populations as a result of the proposed action(s).

Botanical Species

The project area is a mixture of hardwoods and coniferous forests, mainly Douglas-fir (*Pseudotsuga menziesii*) and red alder (*Alnus rubra*). Intermixed within them are western hemlock (*Tsuga heterophylla*), red cedar (*Thjua plicata*) with scattered individuals of big-leaf maples (*Acer macrophyllum*). In the areas of mixed conifers and fairly closed canopy, ground cover consisted mainly of sword fern. In the areas of hardwoods where open canopy was present part of the year, ground cover consists of thick stands of salmonberry (*Rubus spectabilis*). A recently listed noxious weed, Himalayan blackberry (*Rubus discolor*) is present alongside the road within the riparian zone. The open roadside areas support non-native grass species and host a wide variety of exotic grass and forb species. The lichen and bryophyte community is quite diverse, due to a wide variety of habitat including variation between open to closed canopy cover

within the riparian zones. Bryophytes are well represented within the scope of the project area with moisture loving species such as (*Scleropodium obtusifolium*) and (*Brachythecium frigidum)* along with many other varieties widespread on the surrounding substrate present within the riparian areas. The lichen community tends to dominate those areas which contain more light with some species such as *Usnea sp.* and *Hypogymnia sp.* while a few consisted of cyanolichens such as *Lobaria sp.*, and *Nephroma* species growing in nearby overstory hardwoods and conifers.

Botanical Special Status Species

There are no T & E botanical species known or suspected to occur in the project area. Of the 117 Bureau Sensitive and Bureau Assessment species known or suspected of occurring on Coos Bay BLM lands, 21 species are known or suspected of occurring in the project area. Habitat is present for several special status plants that may potentially occur within the proposed project area, there are six Bureau Assessment vascular plant species, seven Bureau Assessment lichens, four Bureau Assessment mosses and one Bureau Assessment liverwort that are suspected of occurring on or near the project area (see the Botany SSS table in the Environmental Consequences chapter). The determination of the potential for these species to occur is based on the proposed project overlapping the known or suspected range of a species as well as the likelihood that potential habitat is present. Potential habitat is determined by aerial photographic interpretation, review of information on each species habitat requirements, and proximity of known site locations.

Hazardous Materials and Solid Waste

Historical records and current site knowledge will govern the existence of any recognized environmental conditions (REC's) for either hazardous substances or solid wastes on those portions of federally-managed lands covered under this proposal. Discovery of REC's may require the activation of the district Hazardous Materials Contingency Plan depending upon the source and circumstances of the condition(s).

Cultural Resources

Few extant cultural resources are known from the Paradise Creek watershed. Prehistorically, the area has been associated with the Yoncalla, although the limits of their influence are unclear. The tribal distribution map in Zenk (1990:Fig. 1, p. 548) shows question marks along the southern and western extent of their territory, which extends to the Paradise Creek watershed.

The Yoncalla have been classified by anthropologists as a Kalapuyan group, because they spoke a language related to that spoken by other inland groups living in and around the Willamette Valley. Prehistorically, the territories of these groups extended from the mountains west of Portland south down the Willamette Valley and surrounding hills, and include the middle course of the Umpqua River. The Yoncalla were the southernmost of these groups. After being decimated by malaria during the early 1830s, the few remaining Kalapuyans were taken to the Grand Ronde Reservation, near Yamhill. Today, they are incorporated in the Confederated

Tribes Grand Ronde, a federally-recognized tribe. At least in part due to this history of dislocation, there is very little specific knowledge of prehistoric lifeways and site locations in the Yoncalla area.

Historic uses include homesteading, forest resource acquisition and construction of roads and railroads. Several 19th Century homesteads are reported in the Paradise Creek watershed, although none are within the project area. An aborted early 20th Century attempt to construct a railway through the Coast Range along the Umpqua River is represented by a partially-completed railroad tunnel and grade in this watershed. Again, these cultural resources are not within the current project area.

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

This section describes environmental effects that may occur if the no-action or action alternatives (including associated mitigation measures and management requirements) are implemented. This information provides a scientific and analytic basis for comparing alternatives. All effects are discussed in terms of environmental changes from the current situation.

Potential Impacts to the Human Environment

Under the no action alternative, no impacts to the human environment would occur on BLM-administered lands.

If the action alternative is implemented, there may be some minor traffic delays where equipment is operating on or adjacent to BLM controlled roads to place logs in streams in the Paradise Creek watershed on both public and private lands, but no road closures are anticipated. The structure placements by land-based operations are expected to take place over a two to three week period during the summer months.

To ensure public safety during helicopter placements, traffic control on BLM controlled roads accessible to the public would be established by flaggers to temporarily block vehicle passage through areas where the helicopter would pass overhead. Because helicopters place logs rapidly, only minor interruptions to traffic would be expected, and all helicopter placements would take place over a period of three to five days during late summer or early fall.

Helicopter operations would also produce substantial noise in proximity to the helicopter, but the noise impacts would be of short duration, and only authorized personnel would work directly under the helicopter. During structure placements, the flight paths for the helicopter would avoid all residences in the area, although a helicopter service area may be established at a private residence near the confluence of Paradise Creek and Little Paradise Creek with the landowner's permission.

Potential Effects on Aquatic Species and Riparian Habitat Conditions

No Action Alternative

Alternative 1, the no action alternative, would not result in direct, indirect, or cumulative impacts to aquatic or riparian habitats within the Paradise Creek watershed on public lands. Under current regulations for both public and private lands, it is likely that fish-bearing channels within the watershed would gain complexity naturally, as trees continue to grow and fall into the streams through time. But considering the extent to which the stream channels and riparian areas have been impacted historically (both by fire and human activities), and the presence of roads will continue to impair the natural delivery of wood and substrate to stream channels well into the future, it is also likely that it will take at least several decades for these channels to regain some semblance of their historical habitat complexity and quality. The no action alternative does not satisfy the purpose and need of the project.

Proposed Action

The propose action is likely to cause some direct negative impacts to aquatic and riparian habitat conditions in the short-term. Some disturbance of fish populations, including special status species, would be inevitable during structure placements due to the nature of the work involving equipment use in the stream channel, and to a lesser degree, placement of logs by helicopter. It is possible that some individuals may be injured or killed during the course of the work, but appropriate measures described under Best Management Practices, Management Requirements, and Mitigation Measures would be taken to minimize the potential for take or harm to occur.

As stated in the incidental take statement of the NOAA Fisheries Programmatic BO, it is anticipated that certain actions (such as the proposed project) are reasonably certain to cause incidental take, and the effects of the actions are largely unquantifiable and are not expected to be measurable as long-term effects on population levels. Take that is incidental to, and not intended as part of, the agency action is not considered prohibited, provided that such taking is in compliance with the terms and conditions of the incidental take statement.

Even though some direct negative impacts to fish populations would occur during structure placements, in the long-term the cumulative effects of the proposed action would likely be increased survival of virtually all aquatic life in the watershed. The structures would provide cover and rearing habitat for fish, amphibians, crayfish and macro-invertebrates, and increase spawning habitat availability and quality for all aquatic-dependant native species.

Aquatic and Riparian Habitats

In the short term (1-5 years), the placement of structures in stream channels would cause areas of streambank erosion both directly by the equipment placing the structures, and indirectly through physical and hydrologic changes to the stream channels (i.e. redirection of flows and localized alterations of stream velocities). Although some increased streambank erosion would occur in the short-term, it is likely that less stream substrate, including fines, would be mobilized to the lower watershed and Umpqua River in comparison to existing conditions because of the increased storage capacity provided by the structures. Improved floodplain interaction would further serve to filter out fines in backwater areas and floodplains, and retain stream bedload of all sizes that would otherwise move downstream.

Even though some stream reaches within the watershed currently have actively eroding streambanks, additional erosion caused by the structure placements could increase turbidity levels over background levels in the sort-term. The adverse effects of fine sediments and turbidity on salmonids and aquatic systems have been well documented in the literature (Meehan 1991; Spence et al. 1996). Suspended sediments can reduce light transmission, impact aquatic macro-invertebrates by altering micro-habitats and entombing benthic organisms, physically abrade and mechanically disrupt respiratory structures in salmonids, and fill and degrade inter-gravel crevices used for spawning or cover, thereby decreasing the carrying capacity of streams. Turbidity can also adversely affect foraging behavior and efficiency of fish and other aquatic life due to reduced visibility. Implementing the proposed action would cause some of these impacts to affect aquatic resources, but the impacts are expected to be short-lived and not impair aquatic

species measurably above existing conditions. Watershed-scale turbidity levels are also expected to decrease through time as the stream channels adjust tin dimension and profile in response to the placed structures, and begin to store sediment in areas currently dominated by bedrock and shallow gravel.

The use of a helicopter to place wood in some areas would result in negligible impacts to streambanks during project implementation, but impacts to streamside areas would occur from either cable yarding or machine placement of structures. Where an excavator or similar heavy equipment would be used for structure placements, some unavoidable disturbances to streambanks and riparian areas would occur from the passage of equipment and the movement of logs and boulders between roads and the stream channels. Some streambank areas where equipment enters the streams would also be disturbed. However, equipment access locations would be established in locations to minimize disturbances to riparian areas, and the affected areas would be seeded and mulched prior to the rainy season.

The long-term effects of the added structures and gravel would be to stabilize stream channels and make them more resistant to erosion by dissipating stream energy during periods of high runoff. Other expected benefits include increased retention and processing of nutrients (Bisson et al, 1987, Sedell et al., 1988), formation of habitats for fish and other aquatic fauna (Bisson et al, 1987, Keller and Swanson, 1979, Sedell et al, 1988), and in some cases, the formation of secondary channels in floodplains (Sedell et al, 1988, Keller and Swanson, 1979). Virtually all of these aquatic benefits meet the objectives of the Aquatic Conservation Strategy as described in the ROD (page B-11).

Other expected benefits that would occur over time include the eventual narrowing of wetted channel widths as channels begin to accumulate more gravel in the substrate composition. The presence of large, complex groupings of woody material and boulder structures in stream channels has the tendency to aggrade gravels upstream and/or downstream. In many cases, these gravel bars will re-vegetate with riparian species such as alder, willow, or maple, ultimately leading to channel narrowing and stabilization. Increased areas of gravel accumulation would also result in more intra-gravel water flow, one of the factors known to contribute to cooler stream temperatures.

Cable yarding logs from roads to stream channels also disturbs ground vegetation, and soil rutting can occur as logs are dragged across the ground; especially by logs with rootwads attached. The extent of ground disturbance would vary depending on site conditions, but as with heavy equipment placement, disturbed ground that might result in sediment delivery to water bodies would be seeded and mulched to stabilize soils prior to the rainy season.

Although line whip from cable placement of logs can impact streamside trees and shrubs, natural openings would be used to the degree possible to minimize impacts. Where tail-hold and intermediate blocks are attached to trees, straps would be used to minimize damage to individual trees. The Coos Bay District has extensive experience in implementing log placement projects in this manner, and these mitigation measures have proven to be highly effective in protecting streamside overstory and understory vegetation.

The felling or pulling over of streamside trees on private lands to reduce the likelihood of movement of wood to downstream reaches would result in only minor decreases in tree numbers relative to the current stocking levels. The standing trees to be placed in the stream would be selected by ODFW staff to minimize impacts to riparian areas, and ensure sufficient trees remain for future recruitment potential.

It is not possible to predict how many alders would be felled to provide safe openings for helicopter log placement, but it would be kept to the minimum necessary to ensure the safety of individuals working underneath the helicopter. The felling of alders would reduce the canopy in the short-term until adjacent trees and understory vegetation responds to the increased sunlight, but only negligible water temperature increases would be expected. Alder in the coast range grows rapidly, and any openings in the canopy would likely be occupied by adjacent alder within a relatively short period of time.

The cutting, felling, yarding, pulling over and transporting of conifers in the areas described above would not impact aquatic or riparian habitats since the work would occur along existing roads and openings around fire ponds. There would not be a mechanism for these activities to cause sediment delivery to streams, or otherwise impact water quality or riparian functions.

The placement of both log and boulder structures throughout the watershed is not expected to impact fish passage of any life stage of salmonids beyond what currently exists in the form of natural barriers. In bedrock-dominated reaches, the structures would increase water depth (thus reducing stream velocities) and resting and cover habitat would be available to all life stages of both salmonids and other native fish species. Boulder weirs would also be designed in a manner to ensure passage for juvenile fish.

Stream Channels, Flood Plains, and Water Quality

No Action Alternative

Under the no action alternative, impacts to streamside areas and stream channels from equipment operation would not occur. Down-cut channels would eventually balance their slope with that of their valley via lateral channel migration and rebuild new floodplains at lower elevations within the existing entrenched channels. For the foreseeable future, in-channel large wood levels would remain undesirable, large wood recruitment potential would remain low, and entrenched channels, especially bedrock-controlled channels such as lower Paradise, would continue to offer minimal habitat complexity.

Proposed Action

The placement of wood and boulders would cause localized soil disturbance, more so with the cable and heavy equipment placements in comparison to helicopter placements. All placement methods would cause short-term, site scale stream turbidity increases. Application of the Best Management Practices during project implementation would minimize these construction-related disturbances.

Because solar radiation is the principal source of heat energy for streams, the number and size of canopy gaps created to provide visibility and safety during the helicopter placements would be kept to a minimum. Less than 250 feet of these openings would be allowed within any 1,000 feet of stream (USDI 1995, Appendix D), and the gaps would be discontinuous. Shrub competition in the gaps and canopy growth adjacent to the gaps together with the immediate shade provided by the multiple logs per site would likely mitigate for the loss of select riparian trees; therefore, negligible water temperature increases are expected.

The removal of whole trees near fire ponds and along designated BLM roads throughout the watershed would not affect water temperatures and future large wood recruitment to local streams because the source areas are located outside of the Riparian Reserves.

Implementing the proposed action would lead to substrate deposition, decreased local stream gradient, increased sinuosity, and the creation of narrower and deeper channels bordered by floodplain in the long-term. Surface and subsurface water storage in the channel, floodplain, and terrace would increase and the streams would be less susceptible to heating. Streams that have well-connected terraces and large amounts of deep gravel will typically have cooler water temperatures (IMST 2004).

Geology and Soils

Geology

No Action Alternative

This alternative would have minimal direct and indirect impacts on existing geologic conditions. Continued development of the natural system would not impact the underlying stratigraphy except in the aspects of geologic time. Large-scale landslides would not be impacted by this alternative. Geomorphology of the area would continue to have the present influences of the current systems.

This alternative would have minimal cumulative impacts on existing geologic conditions. Continued development of the natural system would not impact the underlying stratigraphy except in the aspects of geologic time. Large scale landslides would not be impacted by this alternative. Geomorphology of the area would continue to have the current influences.

Proposed Action

This alternative would have minimal direct and indirect impacts on existing geologic conditions. Continued development of the natural system would not impact the underlying stratigraphy except in the aspects of geologic time.

This alternative would have minimal cumulative impacts on existing geologic conditions. Placement of structures to retain bed load would slow the transport of gravels and possibly reduce the rate of erosion. However, the volume being retained would have no perceivable

impacts on the rate of geologic process. Continued development of the natural system would not impact the underlying stratigraphy except in the aspects of geologic time.

Soils

No Action Alternative

This alternative would have minimal direct or indirect impacts on existing soil conditions. No additional disturbance would occur to soils not compromised by historic activity. Continued flow could entrench into the floodplain, and channelize the system, removing the stream system from the floodplain soils.

Failure to implement this project may delay corrections of previously placed structures that currently have potential as sources for sediment delivery.

Cumulatively, the regeneration of soil would continue. In the short-term, portions of the local floodplain soils would continue to be disconnected from the stream, especially if down-cutting continues. However, through extended time, these processes may return the soils to a pre-European condition.

Proposed Action

Access to place material in the streams would create minor surficial ground disturbance by mobile equipment and placement material. However, by application of the Project Design Features, the effect would be temporary, with vegetation reclaiming the impacts within one to a few growing seasons.

Implementation of the project may allow for corrections of manmade structures placed in that past that currently have potential as sediment delivery sources. Structure placement may cause meandering and bank cutting. However, this would be minor and any loss of soil would be balanced by deposition as in any natural system.

By application of the Project Design Features, any impacts to the soil would be temporary, and there would be no cumulative impacts to the soil resource.

Late Successional Reserve

No Action Alternative

Under the no action alternative, there would be no impact to LSR lands.

Proposed Action

If the proposed actions is implemented, impacts resulting from the removal of trees to be placed in stream channels would be minimal, given that the affected source sites around existing roads and the fire ponds would be reduced to no less than approximately 175 tpa. When thinned in the

future, the residual stands would have significantly lower stocking densities, and impacts to stand composition would be negligible as a result of implementing the proposed action.

Trees that are pulled over from the vicinity of the fire ponds would be yarded short distances to ensure that the root systems are free from the soil. Trees that are felled and cut into suitable log sizes would also be yarded short distances to ensure safe access by helicopters. Trees selected from along existing roads would be felled and yarded to the road for loading on a self-loader, flatbed truck or other similar equipment for transport to log placement sites. Impacts to the affected stands would be negligible, and any ground disturbance would not result in sediment delivery to water bodies. Limbs and tops of trees not suitable for placement in streams would remain on site.

Wildlife

No Action Alternative

Under the no action alternative, there would be no impacts to wildlife species on federal lands. The existing habitat conditions would remain unchanged in the short-term and long-term benefits to wildlife species would not occur.

Proposed Action

Special Status Wildlife Species

Northern spotted owl: Negative impacts to spotted owls may occur due to noise disturbance, but any potential disturbance would be short-term and would occur outside of the nesting season. The proposed project would not result in the removal of suitable nesting /roosting/foraging habitat for the Northern spotted owl.

Marbled murrelet: Much of the project area is within 0.5 miles of suitable marbled murrelet habitat. If murrelets are present, there may be short-term, disturbance impacts. However, any potential disturbance would occur outside of the nesting season and the project would not result in the removal of any habitat for the marbled murrelet.

American bald eagle: Because the proposed action would not result in the removal of suitable nesting or roosting habitat, or removal of habitual perch trees or snags, no negative impacts are expected. Long-term positive benefits may include production of increased prey items for bald eagles.

The proposed action is not expected to negatively impact any special status species at the population level, because of the limited nature of the disturbance and anticipated impacts on the habitat.

In-stream projects such as the proposed action are included in the current programmatic consultation with the USFWS, including re-initiation (BO No. 1-15-04-F-0178) completed on May 7, 2004. The in-stream portion of the project which involves structure placement by ground-based equipment only, is considered a low disturbance activity and would not require

any specific wildlife restrictions. Timber falling and tree-pulling is considered a high disturbance activity and would be required to follow seasonal restrictions if the activities are planned to take place within 100 yards of suitable marbled murrelet habitat. For those portions of the project which involve helicopter use, helicopter flights are seasonally restricted within a distance of 0.5 mile of known spotted owl sites or suitable marbled murrelet habitat. This requirement would essentially apply to all proposed helicopter use because only limited parts of the proposed helicopter log placement areas are outside of the 0.5 mile restricted area and the proposed helicopter landings are within 0.5 mile of suitable marbled murrelet habitat. The seasonal restrictions would allow potentially disturbing activities to only occur before March 1, (spotted owl) or April 1 (marbled murrelet) and after August 5 within the restricted areas around suitable murrelet habitat and spotted owl sites. By adhering to this requirement, the project would be considered "not likely to adversely affect" (NLAA) spotted owls, marbled murrelets, or their habitats, including critical habitat.

Other Special Status Wildlife Species and Habitat

No known sites of any special status wildlife species occur within the project area. The habitat types that would be modified, including heavily-stocked 30-79 year-old conifer stands and riparian alder stands, are very common across the landscape, and the proposed action is not expected to appreciably impact any special status species, because of the amount of similar habitat that remains available. Implementation of the proposed action, with the required seasonal restrictions, would not have any appreciable negative impacts to any wildlife species. While the proposed action may cause temporary disturbance to some wildlife species, the impacts would be short-lived and minor.

Other Wildlife Species

Short-term negative impacts to big game (elk, deer, and bear) from project activities would include noise disturbance and physical disturbance from the presence of helicopters, equipment, and people. These impacts would be considered minimal since the work would be restricted to the instream work period, which is after the calving/fawning/cubbing season. Animals would temporarily avoid using these areas when humans are present, but would readily return to the area following project completion.

There would be a short-term disturbance from project activities for a host of smaller species. These impacts would be considered minimal since they would be restricted to the non-breeding/non-nesting season. Incidental loss of individual animals of less mobile species, such as some amphibians or mollusks may take place, but the loss of these individuals would not lead to a decline at a population level.

As stated in the ACS, there is a need to restore and maintain habitat not only for fish, but for riparian-dependent species as well. Consistent with these objectives, the long lengths of the logs being used for in-stream work would result in portions of these logs extending onto the stream banks and/or floodplains, providing quality cover and breeding habitat for many aquatic and terrestrial riparian-associated invertebrates. The logs would also create quality dispersal and foraging habitat for amphibians, especially during low-flow summer months. Boulder structures

would serve similar functions in retaining and stabilizing gravel and cobble substrates within the stream channel, which would enhance habitat conditions for these species.

Another immediate benefit of log placement would be the "reconnecting" of stream banks. Large logs would create "bridges" for terrestrial wildlife, thus increasing the capability of the riparian areas to function as a connectivity corridor for small mammals. Down wood in riparian areas also provides habitat for many other forms of invertebrates which make up the base of the riparian food chain.

Port Orford Cedar

No Action and Proposed Action: POC is not an issue. The No Action or Proposed Action are both outside the natural range of POC and no POC has been identified in the project area.

Noxious Weeds

No Action Alternative

Under the no action alternative, populations of existing noxious weeds would continue, and spread to suitable sites via the plants "normal" spread mechanism (i.e. animals, humans, water, wind etc…). Brooms and gorse are the main exceptions. The district is currently treating roadside brooms, and all gorse, on an annual basis. Roadside broom is primarily spread by vehicle contact. This area was treated 2 years ago and should be treated again in the summer of 2006. It takes a broom seedling about 3 years to start seed production and doesn't reach full production potential until five or more years old. The district weed team is reviewing potential treatments of other weed species or locations. While tansy ragwort can be present it is considered to be continuously controlled by biological agents, and is not generally of concern.

Cumulatively, if current treatment of brooms and gorse continue the population spread should be slowed or stopped, along roadsides. Existing broom seed beds along roadsides would decrease because of treatments to new sprouts. Exhausting the seed bed would require long term monitoring, treatments, shading and competition, and/or lack of disturbance for 80+ years. Other weed species should continue to follow current trends, including the potential for introduction of new weed species because of human activities.

Proposed Action

Existing noxious weeds (and seed beds) at sites where off-road access is needed would be disturbed by machine access and/or materials being placed. Sites accessed from the road could be disturbed, primarily by the materials placement. Any newly disturbed sites are subject to seed bed germination, re-sprouting of existing parent plants, introduction of new populations from nearby existing populations, and/or introduction of new weed species.

Best management practices incorporated into the project design include machinery washing, and seeding and mulching of disturbed soils. Washing should reduce the chances of new weed

species being introduced by the machines being used, and seeding creates additional competition. At project sites the existing vegetation, coupled with seeding, mulching, and shading over most of the disturbed area should prevent any newly introduced noxious weed species from sprouting or surviving. Disturbed sites without sufficient shading or competition could support newly introduced noxious weed species. Also, other human activities that normally occur, as mentioned under the No Action scenario, could introduce new weeds on the disturbed site or that could reach the newly disturbed sites. Monitoring of the project and monitoring associated with ongoing roadside treatments of noxious weeds should notice any newly introduced noxious weed and should result in treatment of the new species.

The materials being used for instream structures are not being washed. Off-site and/or off-district materials could be infected with new noxious weed species. The potential exists that the materials used for instream structure could have seeds that wash down stream and become established. The concern is not with existing populations of noxious weeds since this could occur under natural conditions and most likely would not significantly alter "normal" population levels. Also, many local noxious weed species are not aquatic-dependent and would not readily become established or flourish in an aquatic environment. Washing of rocks and logs is not easy, cost effective, or likely to sufficiently remove seeds.

No cumulative impacts to existing noxious weed population or their spread are anticipated beyond the levels that normally happen under the No Action scenario due to project design criteria/best management practices. The chances of new weed species being introduced are limited and the district has assigned the highest priority to identifying and treating newly introduced noxious weeds. Monitoring of the project and monitoring for district roadside broom treatments should decrease the chances of new weed species becoming established. Some chance exists of new weed species, especially aquatic associated, being introduced and becoming established from seeds present on the instream materials from off site/off district sources.

Environmental Justice

Environmental Justice (EJ) is not an issue. The No Action or Proposed Action would not impact Environmental Justice issues.

Botanical Species

No Action Alternative

There would be no negative impacts to Special Status botanical species as a result of leaving the proposed project area in its present condition. The mixed coniferous forest and riparian zones would continue to follow successional stages that are typical of forests in the western hemlock/Douglas-fir vegetation zone.

Proposed Action

Vascular plant surveys have yet to be completed, so if any Special Status plants are located in the proposed project area, they would be buffered and protected. The area directly adjacent to the instream structure placement site would be disturbed during implementation of the project through use of heavy equipment. Vegetation most likely to be affected is the shrubs and ground cover that have established the secondary riparian community. In the areas of red alder removal, the surrounding vegetation should help in reestablishing the area of disturbance once the project is completed. The area of disturbance would likely be small though, probably less than ¼ acre. These species are all present elsewhere in the nearby areas, and would more likely still persist elsewhere at the site. Botanical diversity and abundance would decrease where vegetation and soil are disturbed during construction and earth-moving. Restoration with native plants in disturbed areas would enhance botanical diversity and abundance and limit colonization by non-native species.

Since no T & E or SSS are known to occur at or near this site, there would be no cumulative effects to any T & E or special status plant species. Understory vegetation would be disturbed, but similarities in understory vegetation between young stands and old-growth stands suggest that native vascular plants in the Coast Range are resilient to environmental change (Bailey et al. 1998).

Hazardous Materials and Solid Waste

No Action Alternative

Under the no action alternative there would be no risk of hazardous materials or solid waste.

Proposed Action

The use of fueled equipment in the performance of the work identified under this alternative creates a risk to the environment as a result of any release of petroleum product, particularly near or leading to surface waters. Any such release is governed under provisions of State of Oregon Administrative Rule No. OAR 340-108. A Spill Control and Countermeasures Plan (SPCC) conforming to the standards of OAR 340-108 is required. The SPCC should also correlate to the Coos Bay District Hazardous Materials Contingency Plan and the District Spill Plan for Riparian Operations (as applicable). Specifications for spill containment kits are listed under Best Management Practices, Management Requirements, and Mitigation Measures in Chapter 2 above.

In the event of a release of hazardous substances or petroleum product, migration of the contaminant to surface waters would create a variety of problems, dependent upon the amount and type. Most probable sources would be the rupture of hydraulic fluid lines or poor maintenance of equipment, or fueling equipment too close to water sources or drainages, resulting in the leak or discharge of oil. The type of soils impacted would dictate how much of the contaminant could be contained, removed, or allowed to dissipate. A spill confined to dry

land would be contained and cleaned up to appropriate levels identified under Oregon State Soil Clean-up Matrix guidelines.

Under Oregon State Law, a Reportable Quantity (RQ) of petroleum product to water is defined as: *"…any quantity of oil that would produce a visible oily slick, oily solids, or coat aquatic life, habitat or property with oil…." (Reference: Oregon Administrative Rule No. 340-108-010, Reportable Quantities)*. A release to dry land, with no potential for migration to water, is defined as 42 US gallons or greater. Either release would generate a series of reporting, response and monitoring requirements by Federal and State authorities.

Cultural Resources

No Action Alternative

Cultural resources would not be affected under this alternative, as there would be no ground disturbing activities.

Proposed Action

It is not expected that the work associated with this project would affect intact cultural resources. The proposed action focuses on stream channels themselves while potential cultural resources would be located on adjacent terraces rather than in the stream channel. Previous stream restoration work has been conducted in many of these project areas without discovery of cultural resources. As in the previous projects, ground surface disturbance can again be expected on some stream terraces adjacent to the boulder and log placement localities by the actions associated with delivery of the materials in this project. Several techniques would be used to deliver materials, and each would result in a different amount of stream terrace disturbance.

Placement of logs with helicopter would be used along many of the upper reaches of this watershed, where there is no vehicle access to the streams. Ground disturbance to terraces in these areas is expected to be minimal.

Logs or boulders would be placed along the mainstem Paradise Creek by road-based machinery where the road system is adjacent to the stream channel. Terraces are narrow in these areas and are not likely to contain cultural material, so the disturbance associated with cable logging or placing boulders by truck should not affect cultural resources.

Project areas on private lands in the lower reaches of this watershed would have boulders placed in the stream channel using trucks to transport the material along the terraces. These relatively wide terraces were converted to pastures at least 50 years ago and have seen extensive ground disturbance since. Thus, there is little likelihood of disturbing intact cultural resources during the delivery of materials to the stream channel in these areas.

Aquatic Special Status Species Table

Biological evaluation for SSSP which may occur on the Coos Bay District
Paradise Creek Instream and Riparian Restoration Projects

Common and Scientific Names	**Status**[6]	**Species Information**	***Species Present on District lands?***	***Habitat Present in Action Area?***	***Species Present in Action Area?***	***Would the proposed project affect this species?***	***What would the effects be in scope and intensity?***
Fish							
Chum salmon *Onchorhynchus keta*	BS	Anadromous, spawn in fresh water just above tidal influence, juveniles migrate immediately upon emergence	Yes	No	No	No	
Coho salmon (OC) *Onchorhynchus kisutch*	FP	Anadromous, spawn and rear (1.5 yr) in smaller freshwater streams before migrating to ocean	Yes	Yes	Yes	Yes	See the discussion of potential effects on aquatic species beginning on page 22 above.
Coho salmon (SO/NC) *Onchorhynchus kisutch*	FT	Anadromous, spawn and rear (1.5 yr) in smaller freshwater streams before migrating to ocean	Yes	No	No	No	
Fall Chinook salmon (SO/NC) *Onchorhynchus tshawytscha*	BS	Anadromous, spawn and rear in larger freshwater streams/estuaries (0.5 yr) before migrating to ocean	Yes	No	No	No	
Spring Chinook salmon (SO coast/CA coast) *Onchorhynchus tshawytscha*	BA	Anadromous, spawn and rear in medium freshwater streams(0.5 yr+) before migrating to ocean	Yes	No	No	No	
Steelhead (KMP) summer run *Onchorhynchus mykiss ssp.*	BA	Mainstem Rogue River - Rearing and Migration	Yes	No	No	No	

[6] FT = Federally Threatened, FC = Federal Candidate, BS = Bureau Sensitive, BA = Bureau Assessment, BT = Bureau Tracking

Common and Scientific Names	Status[6]	Species Information	*Species Present on District lands?*	*Habitat Present in Action Area?*	*Species Present in Action Area?*	*Would the proposed project affect this species?*	*What would the effects be in scope and intensity?*
Steelhead (KMP) winter run *Onchorhynchus mykiss ssp.*	BA	Anadromous, spawn and rear in medium freshwater streams(0.5 yr+) before migrating to ocean	Yes	No	No	No	
Steelhead (OC) summer run *Onchorhynchus mykiss ssp.*	FC	Mainstem Umpqua River –Rearing and Migration	Yes	No	No	No	
Steelhead (OC) winter run *Onchorhynchus mykiss ssp.*	FC	Anadromous, spawn and rear in medium freshwater streams(0.5 yr+) before migrating to ocean	Yes	Yes	Yes	Yes	See the discussion of potential effects on aquatic species beginning on page 22 above.
Millicoma dace *Rhinichthys cataractae ssp.*	BS	Coos River Basin, rubble areas in swifter waters	Yes	No	No	No	
Snails							
Rotund Lanx (snail) *Lanx subrotundata*	BS	Freshwater snails found in large, turbulent water of large rivers. Confined to mainstem Rogue and Umpqua Rivers	Suspected	No	No	No	
Robust walker *Pomatiopsis binneyi*	BS	Perennial seeps, shallow mud banks and marsh seeps leading into shallow streams. Documented only in Chetco River drainage.	Suspected	No	No	No	
Pacific walker *Pomatiopsis californica*	BS	Wet leaf litter and vegetation near flowing or standing water in shaded areas, high humidity. Documented in the Lower Millicoma River sub-basin.	Suspected	No	No	No	

Wildlife Special Status Species Table

Special Status Wildlife Species on the Coos Bay District Including Federally Threatened, Bureau Sensitive and Bureau Assessment Species (does not include marine or coastal species or Bureau Tracking species)

Common / Scientific Name	Status	Key Habitat, Presence on Coos Bay District	Project Specific Impacts or Effects, comments
Birds			
Marbled Murrelet *Brachyramphus marmoratus*	FT	Late-seral forest, suitable habitat present in project area	NLAA, No suitable habitat removal, seasonal restrictions required.
Aleutian Canada Goose (wintering) *Branta canadensis leucopareia*	BS	Coastal grass lands	None, not present
American Peregrine Falcon *Falco peregrinus anatum*	BS	Cliffs; no potential nest sites in analysis area	None, habitat not present
Arctic Peregrine Falcon *Falco peregrinus tundrius*	BS	Generalist; Cliffs (in breeding range)	None, only an occasional winter migrant on District
Bald Eagle *Haliaeetus leucocephalus*	FT	Late-seral forest, no known nest site near analysis area	No Effect, no known sites within 800 meters of project
Burrowing Owl *Athene cunicularia hypugaea*	BS	Open country	None, not present
Dusky Canada Goose *Branta canadensis occidentalis*	BS	Open grasslands, wet meadows	None, not present
Flammulated Owl *Otus flammeolus*	BS	Oak & pine woodlands, esp. Ponderosa Pine	None, not present
Northern Goshawk *Accipiter gentilis*	BS	Late-seral forest, rare but potentially present	None, no known sites near project area
Northern Spotted Owl *Strix occidentalis caurina*	FT	Late-seral forest, known sites within project area	NLAA, No suitable habitat removal, seasonal restrictions required
Bobolink *Dolichonyx oryzivorus*	BA	Grassland	None, habitat not present
Lewis' Woodpecker *Melanerpes lewis*	BS	Recently burned forest, oak/pine habitats	None, habitat not present
White-tailed Kite *Elanus leucurus*	BA	Pastures, open grasslands; typically low elevations	None, habitat not present
Oregon Vesper Sparrow *Pooecetes gramineus affinis*	BS	Grassland	None, habitat not present
Purple Martin *Progne subis*	BS	Snags in early-seral habitats	None, habitat not affected
Streaked Horned Lark *Eremophila alpestris strigata*	FC	Open beach; open ground with short grass or scattered bushes	None, not present
Trumpeter Swan *Cygnus buccinator*	BA	Marsh, wet meadows, bogs, ponds	None, not present

Common / Scientific Name	Status	Key Habitat, Presence on Coos Bay District	Project Specific Impacts or Effects, comments
Amphibians			
California Slender Salamander *Batrachoseps attenuatus*	BA	Late-seral forests, large down logs (especially class 3-4)	None, presence very unlikely
Foothill Yellow-legged Frog *Rana boylii*	BA	Perennial streams with rock or sand substrate.	None, habitat not affected
Mammals			
Fisher *Martes Pennanti*	FC	Forest with shrub layer and riparian: nests/snags, dead parts of live trees, large live branches	None, habitat not affected
Fringed myotis *Myotis thysanodes*	BA	Requires caves, mines or rock crevices	None, habitat not affected
Gold Beach Pocket Gopher *Thomomys mazama helleri*	BA	Open meadows, open forests, recent forest plantings, (not dense forest)	None, not present
Pacific Pallid Bat *Antrozous pallidus pacificus*	BA	Xeric, possible in SE edge of CB District	None, habitat not present
Pistol River Pocket Gopher *Thomomys bottae detumidus*	BA	Generally open grassy areas	None, not present
Townsend's Big-Eared Bat *Corynorhinus townsendii*	BS	Breed in caves/mines; bridges for night roosts.	None, habitat not affected
Reptiles			
Northwestern Pond Turtle *Clemmys marmorata marmorata*	BS	Lentic water (ponds, slow sections of rivers). Nests in open areas adjacent to water, can overwinter in forest	None, habitat not affected
Invertebrates			
Hoary Elfin Butterfly *Incisalia polia maritima*	BS	Barrens, rocky ridges, dunes, forest edges, adjacent to bogs	None, not present
Insular Blue Butterfly *Plebejus saepiolus littoralis*	BS	Open areas, clover	None, habitat not present
Mardon Skipper Butterfly *Polites mardon*	FC	Grass openings with Idaho Fescue and serpentine	None, habitat not present
Green sideband *Monadenia fidelis beryllica*	BS	Deciduous trees & brush in wet, undisturbed forest at low elevations.	Unknown, minimal disturbance to habitat
Klamath Tail-dropper *Prophysaon sp.nov.*	BS	Spring fed meadows or seeps with sedges and grasses	Unknown, minimal or no impact to potential habitat
Salamander Slug *Gliabates oregonius*	BS	Mature conifer forest w/leaf litter	Unknown, minimal impact to potential habitat
Sisters Hesperian *Hochbergellus hirsutus*	BS	Moist, deciduous leaf litter	Unknown, presence very unlikely, minimal impact to potential habitat
Oregon Shoulderband *Helminthoglypta hertleini*	BS	Rocky & talus substrates	None, habitat not affected
Spotted Tail-dropper *Prophysaon vanattae pardalis*	BS	Moist, mature forests w/deciduous/shrub layer. Coastal fog zone.	None, not present
Tillamook Westernslug *Hesperarion mariae*	BS	Unknown, potentially present on District	Unknown, minimal impact to potential habitat

Botanical Special Status Species Table

*****Pre-disturbance surveys are recommended for bolded species.

*Scientific and Common Name	Documented (D) or Suspected (S) on Coos Bay District	Status/ practicality of surveys	Habitat and Location	Likelihood of Occurring in the Project Area	Management Activity Likely to Impact Species if Found in Project Area **Yes/No/Unknown**	Management Activity likely to Impact Population if Species is located in Project Area. **Yes/No**
Adiantum jordanii (California maiden-hair)	D	BA (surveys practical)	Perennial herb, moist shaded seeps, hillsides, or moist woods and forests, <1,200 m.	Moderate.	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)
Aster vialis **(**=Eucephalus vialis) Wayside Aster	S	BS (surveys practical)	Dry upland sites with Douglas-fir, golden chinquapin and Oregon white oak, edges between forest and meadow, 500 to 3,150 feet in Lane, Douglas, and Linn Counties.	Moderate	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)
Baccharis douglasii (Marsh Baccharis)	S	BA (surveys practical)	Perennial subshrub, salt marshes and stream edges, 0-750 m.	Moderate.	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)
Carex gynodynama (hairy sedge)	D	BA (surveys practical)	Perennial, moist meadows and open forests, <600 m, Smith Pond off of Signal Tree road at T30S, R9W, Sec 3.	Low-Moderate. The only known site of this species on district is in the Signal Tree	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)

*Scientific and Common Name	Documented (D) or Suspected (S) on Coos Bay District	Status/ practicality of surveys	Habitat and Location	Likelihood of Occurring in the Project Area	Management Activity Likely to Impact Species if Found in Project Area **Yes/No/Unknown**	Management Activity likely to Impact Population if Species is located in Project Area. **Yes/No**
				area. .		
Cimicifuga elata (Tall Bugbane)	S	BS (surveys practical)	Perennial forb or herb, Hardwood mixed Douglas-fir forest, locates near creeks, (north slopes) north of Umpqua River, and east side of district, flowers June to early August.	Moderate	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)
Iliamna latibracteata (California globe mallow)	S	BA (surveys practical)	Perennial forb or herb, moist ground and stream banks, blooms June and July, Big Sandy Tie road at T28S, R10W, Sec 31; a site at T31S, R12W, Sec 17 was extirpated during culvert replacement in 1999.	Low-Moderate. The only known site on District is along the Big Creek mainline. It prefers areas with more light openings in the forest, recent burns, roadsides, etc.	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)
Polystichum californicum (California sword fern)	S	BA	Perennial forb or herb, fern, woods, stream banks, shaded rocky outcrops, Pistol River at T38S, R14W, Sec 22 and Indian Creek Road at T29S, R12W, Sec 24.	Low	**Unknown:** minimal or no impact to potential habitat. **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)
Sidalcea malviflora ssp.	S	BA	Perennial herb, open coastal forest, prairie, mixed evergreen	Moderate.	**Yes**-if species is present	**No**: Plants would be buffered to minimize any impact the

*Scientific and Common Name	Documented (D) or Suspected (S) on Coos Bay District	Status/ practicality of surveys	Habitat and Location	Likelihood of Occurring in the Project Area	Management Activity Likely to Impact Species if Found in Project Area **Yes/No/Unknown**	Management Activity likely to Impact Population if Species is located in Project Area. **Yes/No**
patula (Coast Checker Bloom)			forest, coastal headlands, open meadows; sea level to 2,600 ft; Edson Butte at T31S, R14W, Sec 22; Grizzly Mountain at T37S, R14W, Sec 4; flowers in May and June.		**No** if species not found	project might have on population as a whole. (See Special Status mitigation measures section)

NON-VASCULAR PLANT SPECIES

*Scientific Name	Documented (D) or Suspected (S) on Coos Bay District	STATUS/ practicality of surveys	Habitat and Location	Likelihood of Occurring on the Project Area	Management Activity Likely to Impact Species if Found in Project Area : **Yes/No/Unknown**	Management Activity likely to Impact Population if Species is located in Project Area **Yes/No**
Bryoria subcana (Lichen)	S	BA (surveys impractical)	Coastal forest and high precipitation summit. One Coos Bay BLM site located in Big Creek in a mature forests stand (>100 yrs). Species is rare (16 sites within its range)	Moderate The only known site of this on district is from Big Creek in a late-seral forest stand.	**Unknown**- minimal or no impact to potential habitat. **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)
Calicium adspersum (Lichen)	S	BA (surveys practical)	Growing on highly textured bark on boles of old growth conifer trees. 3 sites located in W. Cascades and Oregon Coast Range 2 sites in Vancouver Island, BC.	Low-Moderate	**Unknown**- minimal or no impact to potential habitat. **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on the population as a whole. (See Special Status mitigation measures section)
Diplophyllum plicatum (Liverwort)	S	BA (surveys impractical)	Tree boles of western hemlock and red cedar.	Moderate There are several sites on district mainly in late-seral and old-growth stands.	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)

*Scientific Name	Documented (D) or Suspected (S) on Coos Bay District	STATUS/ practicality of surveys	Habitat and Location	Likelihood of Occurring on the Project Area	Management Activity Likely to Impact Species if Found in Project Area : **Yes/No/Unknown**	Management Activity likely to Impact Population if Species is located in Project Area **Yes/No**
Erioderma sorediatum (Lichen)	D	BA (surveys practical) Refer to SSS policy and IB # OR-2004-145	Humid, oceanic localities in OR and WA, on pine trees and shrubs, old dunes, on ericaceous shrubs or conifers, documented at North Spit ACEC, Bluebill Lake, Spinreel, and Eel Creek (Oregon Dunes NRA), CR Ecoregion. Also occurs in Oregon Coast Range (Glavich Report 2004) and one site in WA in young ALRU riparian stand. (Lesher et al. 2000).	Low to Moderate Has been found in several areas along the coast range but is known to be located on red alder in riparian zones also.	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)
Heterodermia leucomelos (Lichen)	S	BA (surveys impractical)	Sitka spruce and shore pine branches on forested headlands in the coastal fog zones. Might also be found inland in riparian areas, moist valleys and fog-intercept ridges (USDA 2003). Has been found in both coastal and inland forests on Coos Bay BLM.	Moderate Has been found several times on district. It occurs in forested stands and riparian areas, but is small and easy to overlook while surveying.	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)

*Scientific Name	Documented (D) or Suspected (S) on Coos Bay District	STATUS/ practicality of surveys	Habitat and Location	Likelihood of Occurring on the Project Area	Management Activity Likely to Impact Species if Found in Project Area : **Yes/No/Unknown**	Management Activity likely to Impact Population if Species is located in Project Area **Yes/No**
Hypotrachnya revoluta (Lichen)	S	BA (surveys practical)	Usually on bark and rarely on rock, Coast Range and immediate coast in OR, at Cape Arago, also from Rocky and Appalachian Mountains, east coast of Canada, Great Lakes area, and southwest border of US with Mexico.	Low-Moderate	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)
Lobaria linita (Lichen)	S	BA (surveys practical)	Mature to old growth forests, oak forests with rock outcrops, late-mature tanoak and madrone forests, 1,800 to 6,700 ft, formerly S&M A, CR & WC Ecoregion.	Moderate. Habitat is present on Coos Bay BLM lands but it has not been located after several years of pre-project timber sale surveys on district.	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)

*Scientific Name	Documented (D) or Suspected (S) on Coos Bay District	STATUS/ practicality of surveys	Habitat and Location	Likelihood of Occurring on the Project Area	Management Activity Likely to Impact Species if Found in Project Area : **Yes/No/Unknown**	Management Activity likely to Impact Population if Species is located in Project Area **Yes/No**
Rhizopogon exiguous (Fungi)	S	BS (surveys impractical)	Coastal, known site at Mapleton, hypogenous fungi in coniferous forest, CR & KM Ecoregion.	Low: Habitat is present and it occurs in coniferous forest near Mapleton on the Siuslaw NF. However, hypogenous fungi are easy to overlook and often require microscopic examination to identify to species.	**Unknown-** minimal or no impact to potential habitat. **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)
Schistostega pennata (Moss)	S	BA (surveys practical)	Mineral soil in shaded pockets of overturned tree roots, often with shallow pools of standing water at base of root wad. Also grows attached to rock or mineral soil around entrances of caves, old cellars and burrows, CR & WC Ecoregion.	Moderate	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)

*Scientific Name	Documented (D) or Suspected (S) on Coos Bay District	STATUS/ practicality of surveys	Habitat and Location	Likelihood of Occurring on the Project Area	Management Activity Likely to Impact Species if Found in Project Area : **Yes/No/Unknown**	Management Activity likely to Impact Population if Species is located in Project Area **Yes/No**
Sulcaria badia (Lichen)	S	BA (surveys practical)	West side, valley fringe; rare on coast; usually on hardwoods (oak, madrone, and manzanita species), sometimes on conifers, documented at Eel Creek, Oregon Dunes NRA; CR, KM, & WV Ecoregion.	Moderate Habitat is present on Coos Bay BLM lands but has not been located in several years of pre-project surveys.	**Yes**-if species is present **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)
Tetraphis geniculata (Moss)	S	BA (surveys practical)	Found on down logs in late-seral conifer forests in W. OR and WA.	Low Habitat is present on Coos Bay BLM lands but it has not been located after several years of pre-project timber sale surveys on district.	**Unknown**- minimal or no impact to potential habitat. **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)
Tripterocladium leucocladulum (Moss)	S	BA (surveys practical)	Forms dense silky mats on shaded to exposed rock, cliffs, and bark of hardwoods such as tan-oak, canyon live oak, and bigleaf maple, occurring mostly at low elevations, BM, KM, & WV Ecoregion.	Low	**Unknown**- minimal or no impact to potential habitat. **No** if species not found	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)

*Scientific Name	Documented (D) or Suspected (S) on Coos Bay District	STATUS/ practicality of surveys	Habitat and Location	Likelihood of Occurring on the Project Area	Management Activity Likely to Impact Species if Found in Project Area : **Yes/No/Unknown**	Management Activity likely to Impact Population if Species is located in Project Area **Yes/No**
Triquetrella californica (Moss)	S	BA (surveys practical)	Reported from trails, roadsides, picnic areas, and rock outcrops on exposed to shaded soil, rocks, sand, coastal shore pine, and Sitka spruce, CR Ecoregion.	Low	**Unknown-** minimal or no impact to potential habitat. **No** if species not found.	**No**: Plants would be buffered to minimize any impact the project might have on population as a whole. (See Special Status mitigation measures section)

Interdisciplinary Team

Tim Barnes	Soil Scientist/Geologist/Energy Development
John Chatt	Wildlife Biologist
John Colby	Hydrologist
Scott Knowles	Environmental Justice / Noxious Weeds / Port Orford Cedar
Stephan Samuels	Cultural Resources
Jennifer Sperling	Botanist
Dan Van Slyke	ID Team Lead / UFO Restoration Coordinator / Fishery Biologist
Tim Votaw	Hazardous Materials

Project Support and Development

Phil Adams	Roseburg Resources, Inc.
Bill Arsenault	Private Landowner
Bill Cannaday	Oregon Department of Fish & Wildlife
Dan Jenkins	Oregon Department of Fish & Wildlife
Bob Kinyon	Umpqua Basin Watershed Council
Sam Moyer	Oregon Department of Fish & Wildlife

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