

ENVIRONMENTAL ASSESSMENT
EA : OR-128-99-14

A proposal to construct a Streambank Erosion Control Project
Through Jobs-In-The -Woods Funding
In Sixes River Analysis Area

Proposed this 10th Day of May, 1999

This action is subject to and in conformance with the *Coos Bay District Resource Management Plan*, with its *Record of Decision* (BLM 1995), and 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* with its *Record of Decision* and *Standards and Guidelines* (Interagency, 1994).

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Section I - Purpose of and Need for Action

Purpose

The Bureau of Land Management (BLM), in conjunction with other Federal land agencies, is directed to conduct watershed analysis and restoration projects to restore and maintain water quality and aquatic, riparian, and terrestrial habitats. This guidance comes directly and is tiered to the *Coos Bay District Resource Management Plan (RMP)*, *Environmental Impact Statement (EIS)* and its *Record of Decision (ROD)* (BLM, 1995). Watershed analyses for the Sixes River Watershed has been conducted (USFS, 1997). The following streambank erosion control project is directly related to several management recommendations from that analysis (USFS, 1997, A-38,39), and is in conformance with the Aquatic Conservation Strategy (ACS) objectives described in the *Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* (Rod Interagency, 1994). The intent of the proposed action is to control bank erosion/channel migration at the Edson Creek Recreation Site to maintain present hydrologic function and meet recreation objectives.

Edson Creek Recreational Site was acquired in August of 1995 through a donation Quit Claim Deed from Curry County. The deed was granted under the condition that the park would continue to be managed for recreation. The Sixes Watershed Analysis indicates that "terrain and topography along with land management designation limits current and future developed recreation on National Forest in the watershed, (USFS, 1997, p. S-9)". Any developed campsites at Edson Creek Recreation Site could probably not be replaced elsewhere within the watershed.

The purpose of the environmental assessment is to:

- ✧ assess any potential environmental impacts that may result if the No Action, Proposed Action or the Alternative is implemented,
- ✧ identify appropriate mitigation measures, and
- ✧ document the decision-making process.

Additional specialist reports and analysis documents are contained in the analysis file and hereby incorporated by reference.

Need

The November 18, 1996 flood, and subsequent high waters during January, 1997 and the winter of 1998-99 resulted in lateral stream migration, bank cutting and loss of riparian vegetation on Edson Creek. Edson Creek's radius of curvature is increasing on several bends; if not controlled, this will eventually result in a meander cutoff. The stream reach within the recreation area is moving toward a straighter, steeper, braided and higher-energy channel type.

Significant bank erosion is compromising water quality and negatively impacting fish habitat. In addition, there is loss of recreational value in terms of campsites, river access, and investment.

The goals of the proposed project are to:

- ✧ protect the recreation site to maintain existing recreation opportunities,
- ✧ reestablish "appropriate rates" of bank erosion and channel migration through stream channel modification (Rod Interagency, 1994, B-11),
- ✧ meet recreation and transportation goals,
- ✧ enhance aquatic habitat by increasing pool depth, and adding complex cover elements, and
- ✧ transplant native trees to help stabilize the bank, to provide shade, thermal regulation and wildlife habitat.

Identified Issues and Resolutions

The following issues were identified by the interdisciplinary team (IDT) assigned to analyze the proposed project.

Issue 1: Are there impacts of the proposed plan to Marbled Murrelet habitat? If so, how can any impact that might occur be mitigated?

Resolution: ID Team member Steve Langenstein (Myrtlewood RS, Wildlife Biologist) does not anticipate any impact on Marbled Murrelet habitat. There are no known Marbled Murrelet occupied sites or Northern Spotted Owl nests within the area of impact of this recreation area. However, a few trees within .25 miles of the proposed project area have been identified as suitable habitat and Marbled Murrelet presence was detected in the late season of 1998 on the ridge East of the campground. Due to the proximity of suitable habitat a daily timing restriction of operating hours between two hours after sunrise and two hours before sunset for all construction activities will apply. In addition, if disturbance from the proposed action is 10 days or longer, implementation of the project should occur after August 6th

Issue 2: Is continued use of the recreation sites near the project area compatible with the long-term effectiveness of the streambank erosion control project?

Resolution: The Standards and Guidelines of the ROD for the Northwest Forest Plan for recreation facilities within Riparian Reserves requires the evaluation and mitigation of impacts "to ensure that these to do not prevent, and to the extent practicable, contribute to attainment of the Aquatic Conservation Strategy objectives"(p.C-34). ID Team member Tami Torres (Myrtlewood RS, Recreation Specialist) does not anticipate any conflicts between recreation activities and proposed project. The following management strategies were developed to limit and monitor the effects of recreation use on the streambank erosion control project.

- ✧ an exclusionary structure would be installed roughly 20ft from the bank along the project site to ensure reestablishment and viability of the willow transplants and myrtlewood seedlings (See Appendix A),
- ✧ due to reduced size and change in configuration, consider the following visitor use options for campsite #20 and R1A: tent site with vehicle

- ◇ barricades, or picnic site with vehicle barricades,
- ◇ educate campsite users on the streambank erosion control project and the key features to preserving it (interpretative signing), and
- ◇ monitor recreation activities with camp hosts and recreation staff presence to help prevent degradation from human abuse.

SECTION II - ALTERNATIVES INCLUDING THE PROPOSED ACTION

No Action Alternative

Description

No project will be planned. The bank will continue to erode, and the stream will wander and continue to exhibit high widths and moderate to shallow depths.

Proposed Action

Description

The Proposed Action is to apply a bioengineering design to reestablish the desired channel dimension and maintain appropriate rates of bank erosion and channel migration. A combination of rock, logs and rootwads would be used to resist or move high stream flow energies away from the outside of an actively eroding bend, within the ordinary high water line of Edson Creek. Small clumps of willows from a nearby donor site and nursery stock myrtlewood would be transplanted to help stabilize the top of the bank, to provide shade, thermal regulation and song bird and riparian mammal habitats. Some minor bank shaping would occur above the ordinary high water line.

The proposed stream structures are either rock or log vanes, orientated upstream along the outside of the eroding channel bend (Appendix B). These structures work by slowing the flow along banks by forcing water to run uphill, and then spilling the flow across the top of the vanes toward the center of the channel. Rock vanes would be installed at approximately 100 foot intervals, oriented upstream at 20-30 degrees from the bank, and sloping down at the angle of the point bars. Eight to ten rock vanes would be installed over a 1000 foot distance, requiring approximately 50 yd³ of streambed gravel removal and 400 yd³ of fill with large rock. Removed gravels, necessary to key the footer rocks below the streambed would be spread on unvegetated portions of the point bar on the opposite side of the channel. Rock vanes would be 35-50 feet long, four feet wide and three-four feet high. Log vanes would be placed between the rock vanes and have a similar orientation and function. About 8-10 log vanes, a minimum of 20" in diameter and 35-60 feet in length, would be utilized, and would require approximately 20 yd³ of streambed gravel removal and 40 yd³ of fill with log material. Root wads with 14'-20' boles attached and a minimum diameter of 16", would be placed in association with the rock and log vanes to prevent stream bank cutting in severely eroding sections of the bank and pools. About 10-12 root wads would be placed, resulting in approximately 30 yd³ of fill with woody material. Equipment that would be needed for the proposed project include: track-mounted excavator, rubber-tired backhoe and dump truck.

The proposed project would require the use of three donor sites for rock and woody material. Rock material, 34 inches maximum size (Class 6), would be obtained from a nearby private quarry on Sixes

River Road. The proposed donor site for willow transplants is located on State of Oregon property approximately two miles from the project site on Sixes River. Willow transplants would be taken in small clusters to minimize the impact of vegetative cover on site. Myrtlewood seedlings grown from local seed would be purchased from Alt House Nursery in Cave Junction, OR. The conifer donor site (rootwads and log vanes) would be located on BLM land. The proposed trees would be removed from four roadside locations within the area referred to as White Mountain in the adjacent Floras Creek Watershed. Eighteen Douglas fir trees, a minimum of 20" in diameter, were selected by ID team members to minimize impacts to wildlife, and Survey and Manage botanical species.

Additional Design Features and Conservation Practices

- ✧ all construction activities would be in conformance with the Best Management Practices for Maintaining Water Quality and Soil Productivity described in the Coos Bay District ROD and RMP, Appendix D.
- ✧ the project would comply with the joint Department of State Lands/Corps of Engineers Removal Fill Law permitting process, and Curry County's comprehensive plan and local zoning ordinance approvals,
- ✧ any in/near stream work involving heavy equipment is subject to State and Federal Law governing petroleum spill prevention and cleanup. These include Oregon Administrative Rules (OAR) 340, Division 108, Oil and Hazardous Materials Spills and Releases (DEQ), and OAR 629-57-3600, Petroleum Product Precautions, and Oregon Forest Practices Act,
- ✧ contractors or operators should be made aware of the BLM Coos Bay District Spill Plan in effect for riparian operations, and it should be followed in the event of any release of petroleum or hazardous materials,
- ✧ all construction activities would be in conformance with the Prototype Weed Prevention Practices described in Partners Against Weeds (January 1996), Appendix 4,
- ✧ due to the proximity of suitable habitat for Marbled Murrelet all construction activities between April 1st and September 15th would be subject to daily timing restrictions. Operating hours are between two hours after sunrise and two hours before sunset,
- ✧ due the proximity of suitable habitat for Marbled Murrelet and the instream work period for salmonids implementation of the proposed project would occur between August 1st and September 30th.
- ✧ transplant material would be of appropriate stock size and planted at the appropriate time of dormancy,
- ✧ an exclusionary structure would be installed roughly 20ft from the bank along the project site to ensure reestablishment and viability of the willow transplants and myrtlewood seedlings (See Appendix A),
- ✧ in order to prevent *Phytophthora lateralis* (Port-Orford cedar root rot) spores from entering the streamcourse, require equipment washing prior to entering BLM lands,
- ✧ ensure the source of willow transplants and root wads is away from the presence of POC, Pacific yew, and *Phytophthora lateralis* diseased trees, and
- ✧ ensure rock source is not adjacent to any POC, Pacific yew, or *Phytophthora lateralis* diseased trees, and wash rock before placement.

Alternative I

Description

The alternative design is to riprap the entire outside bend of Edson Creek within the recreation site. This alternative will involve approximately 1000 ft along the bank and 1200 yd³ of rock material. In addition, some shaping and backfilling of the bank will be necessary. Willow from a nearby donor site and nursery stock myrtlewood seedlings would be transplanted to help stabilize the bank, to provide shade, thermal regulation and song bird and riparian mammal habitats. All additional design features and conservation practices listed above will apply.

Alternative Considered but Not Analyzed

Description

An alternative action of removing both campsites entirely from use was proposed but dismissed, since it did not meet the purpose and need or recreational objectives for the project. This action would have removed the campsites from use to reestablish natural vegetation throughout the entire site. This proposal was born out of the concern that continued use of the campsites could reduce the viability of the transplants and compromise the project's effectiveness in controlling streambank erosion. The following design features and conservation practices were developed to manage these concerns.

Design Features and Conservation Practices

- ✧ provide a commercial source of firewood within the campground,
- ✧ an exclusionary structure would be installed roughly 20ft from the bank along the project site to ensure reestablishment and viability of the willow transplants and myrtlewood seedlings (See Appendix A),
- ✧ educate campsite users on the control project and the key features to preserving it,
- ✧ monitor recreation activities with camp hosts and recreation staff presence to help prevent degradation from human abuse, and
- ✧ due to reduced size and change in configuration, consider the following visitor use options for campsite #20 and R1A: tent site with vehicle barricades, and picnic site with vehicle barricades.

SECTION III - AFFECTED ENVIRONMENT

This section describes the environmental components that may be affected by the Proposed Action in the Alternative being analyzed. This section does not address the environmental consequences, but rather acts as the baseline for comparisons in Section IV - Environmental Consequences.

Location

Located in the Southern Oregon Coastal area, the Edson Creek Recreation Site is located 4 miles east of US Highway 101 on Sixes River Road. The project is located approximately 600 ft from the confluence of Edson Creek and Sixes River. The donor site for the willow transplants is located on Oregon

Department of Fish and Wildlife property approximately two miles up Sixes River Road. The second donor site for the conifer (log vanes and rootwads) is located in the White Mountain area, south of Floras Creek. The legal descriptions of the project site and related donor sites are as follows:

Project area: Township 32 South; Range 14 West; South ½ of Section 6.
Willow donor site: Township 32 South; Range 14 West; South ½ of Section 11.
Conifer donor site: Township 31 South; Range 14 West; Section 17.

Wildlife, Including T & E Species - Issue 1

This recreation area is within a Riparian Reserve; the parcel was acquired by BLM after the existing land use plan was completed. There are no known Marbled Murrelet occupied sites or Northern Spotted Owl nests within the area of impact of this recreation area. However, a few trees within .25 miles of the proposed project area have been identified as suitable habitat, and Marbled Murrelet presence was detected in the late season of 1998 on the ridge East of the campground. A daily timing restriction of operating hours between two hours after sunrise and two hours before sunset for all construction activities will apply since suitable habitat is within .25 miles of the project site. The area is within the range of Bald Eagle (primarily winter habitat). The project proposals will have a "May Effect, not likely to adversely effect" on Bald Eagles, and therefore will need to have a completed informal section 7 consultation (in progress as of 3/18/99). Consultation for the Marbled Murrelet has already been completed through a programmatic consultation package.

A review of the aerial photographs of the campground showed heavy disturbance and the absence of any major forested riparian community in the 1940s. The riparian vegetation has changed over time and the site seems most vegetated in the 1970s. Some small willow trees have been lost over the past few years through bank erosion, but willows directly adjacent to the campsite showed stress from broken branches. The loss of woody and riparian vegetation has reduced wildlife habitat in the general area of the campground. This site, as shown in the 1970s photos, provided a higher level of songbird (ground, shrub, tree types of habitat), small mammal (beaver, mink, weasel, river otter, vole sp., shrew sp., rabbit, skunk etc.), herptile (garter snakes sp., Pacific giant salamander) and invertebrate habitats.

Eighteen Douglas-fir trees at the White Mountain donor site were analyzed to be used as the instream structures for the proposed streambank erosion control project. All but two of the trees were alive and varied in diameter (dbh) from about 20" to over 30". The two deceased trees were classified as a Class I snag and wind thrown log, and will remain on site. Additional trees were identified to replace the deceased trees and several suitable habitat trees that were originally selected. A total of eighteen trees were selected to minimize impacts to wildlife species.

Recreation Resources - Issue 2

Edson Creek has migrated North and into the developed campground portion of the Edson Creek Recreation Site, specifically at sites, #20, Reservation Site R1A, and R1B as well as the vehicle turnaround. Edson Creek bank has eroded over 30 feet into these sites since 1996.

This recreation site is popular for camping and swimming from late spring to early fall. The setting is enjoyed by many local families and groups. Tourists traveling US Hwy. 101 from out of state and around the world also camp here.

Edson Creek RS is most popular for social gathering where; 55% of visitors camp, and 45% picnic. Fishing, swimming, and water play all reflect 10% of use for each activity. Half of the use comes from local origin, 30% from less than 10 hours away, 18% from more than 10 hours away and 2% from other nations. Visitor use estimated from fee envelopes for 1998 was 2,791.

Aquatic Habitat/Fisheries, Including T & E Species

The condition of the aquatic habitat and salmonid fish populations in Edson Creek are described in the Sixes River Watershed Analysis (1997) on pp. A-32 to A-34. In summary, this information indicates that the lower reach of Edson Creek (which includes the BLM Recreation Site) was heavily inundated by sediments during the 1964 flood, and has been in a very gradual recovery [cutting through the sediment deposits to establish a stable meander pattern] since 1980. Available aquatic habitat within the BLM Recreation site is characterized by sparse LWD cover and shallow pools. Edson Creek supports populations of fall chinook, coho, steelhead, resident rainbow trout, and cutthroat trout. Anadromous habitat is limited to the lower 2.5 miles; the highest quality spawning habitat occurs within the lower mile.

Edson Creek is not currently listed (303d) as water-quality limited. However, the Sixes River Watershed Analysis (1997) cites Southcoast Watershed Council monitoring data from 1995 indicating a 7-day average maximum water temperature of 67.3° F. Although a definitive long-term trend cannot be established because the historic temperature data is limited, evidence from the Sixes River Watershed Analysis (1997) suggests that summertime water temperatures in Edson Creek may still be recovering from logging which removed "all vegetation down to the stream."

The Sixes River Watershed is within the Oregon Coast coho salmon ESU (listed as Threatened under the ESA), the Oregon Coast steelhead trout ESU (federal candidate), and the Oregon Coastal cutthroat trout ESU (federal candidate).

Hydrology

Edson Creek Recreation Site is situated along Edson Creek, a tributary to the Sixes River in Northern Curry County. The November 18, 1996 flood, and subsequent high waters during January, 1997 and the winter of 1998-99 resulted in lateral stream migration, bank cutting and loss of riparian vegetation. The stream is a low gradient pool/riffle channel with moderate meandering and high amounts of gravel/cobble bed material. It would be classified as a C4 bar-braided channel (Rosgen 1996).

Bank retreat rates have varied from 5-40 feet annually through the project area in the last several years. An estimated 1000-5000 yds³ of stream alluvium are being exported downstream each winter.

The stream channel and riparian area have been altered in the past and the channel is actively adjusting. As a result, the stream reach within the recreation site is trending toward a straighter, steeper, braided, higher energy channel type (Rosgen D4). The stream is slightly entrenched, but has an expansive floodprone area about 8"-12" above bankfull. Much bankcutting is occurring on the outside of bends

where the bank height is above the bankfull stream elevation. Edson Creek's radius of curvature is increasing on several bends; if not controlled this will eventually result in a meander cutoff and a straighter, shorter channel. Channel morphology indicates that the channel is currently at minimum hydraulic parameters to maintain a C4 channel type and is trying to convert to a D4 channel type. This evidence includes: a meander width ratio of 4-5 (average values for C channels are 11.4). The stream's radius of curvature of some bends are increasing, and ratios of bankfull to bank height on the outside of some bends exceed 1.2. Additionally, width/depth ratios (bankfull width divided by the bankfull mean depth) of Edson Creek through the project area are currently at 30-40 (average values for C 4 channels are 12-30). This provides further evidence that the channel type is progressing toward the braided D4 channel type. C channel types are dependant on the natural stability of streambanks including the riparian vegetation which resists the critical shear stress of the stream on banks in bends. The active lateral channel migration points coincide with the dearth trees and the associated lack of root strength to resist the stream's shear stress.

Vegetation, Including T & E Species

The Edson Creek Recreation Site is located in a large, open, grassy lawn bordered by red alder (*Alnus rubra*), myrtlewood (*Umbellularia californica*), willow (*Salix* species), salmonberry (*Rubus spectabilis*) and blackberry (*Rubus discolor*). No Special Status or Survey and Manage strategy 1 and 2 species were found within the recreation site during the January 14, 1999 survey. The Edson Creek recreation site does not provide suitable habitat for Special Status or Survey and Manage plant species.

The conifer donor site was surveyed for Survey and Manage species on April 13th and 22nd of 1999 (Rod Interagency, 1994). *Ulota megalospora*, a protection buffer moss, was found on one *Rhododendron macrophyllum* shrub located within the largest of the four roadside locations. *Loxosporopsis corallifera*, a component 1 & 3 crustose lichen, was found on sixteen of the eighteen trees proposed for removal. The two trees without *Loxosporopsis corallifera* were located in a different roadside location where the forest is almost devoid of all non-vascular species. The roadside locations containing *Loxosporopsis corallifera* were surveyed and a total of 263 *Pseudotsuga menziesii* trees were found to contain patches of the lichen. Visual observation confirmed that the population of *Loxosporopsis corallifera* was healthy and its habitat reached far beyond the boundaries of the survey.

Maps and photographs were used to assess the habitat qualities of the willow donor site. No known vascular or non-vascular plant occurs at or near this site. Photographs show that habitat for Survey and Manage or for Special Status vascular plants does not exist at the site. The general area was assessed on May 3, 1999 and no Survey and Manage non-vascular species were found.

Soils

This project area is located within a Quaternary fluvial terrace deposit. The unconsolidated to semi-consolidated flat-lying alluvial deposits of sand, gravel and silt overlook present day flood-plains. Hazards in the local area include streambank erosion, local ponding and flooding in places. According to the Sixes River Watershed analysis this area was overwhelmed by alluvial materials in the mid 1960s after record rainfalls and flood events. The stream was re-established largely within the old channel after

that event. According to the data available the soil type in this area is considered a Logsdon (0-3%) silt loam. This soil type is very deep and well drained, but subject to rare periods of flooding.

The willow donor site along Sixes River is on an alluvial bed adjacent to the river. Rocks and gravels make up the bulk of the land but some silty sand normally found in these areas is also present.

The White Mountain area, south of Floras Creek, is largely made up of the Otter Point and Colebrooke Schist Formations. The specific donor site in Section 17 is on the Colebrook Schist portion and has moderate permeability of the clay loam soils. There are no local mass movements on the ridges where the trees are to be removed. The surface of the area is covered with a heavy layer of schist rocks interspersed with soil and organic matter. The area receives a high amount of precipitation each winter and generally has some snow accumulation for short periods.

Hazardous Material

A Hazardous Material Level I Site Survey was completed for the project area and associated donor sites in April, 1999. There are no known hazardous materials within the project area or the donor sites.

Cultural Resources

Class I Inventory (review of project documentation and records check) showed cultural resources were not reported within the immediate vicinity of the project area or either source area. A reconnaissance survey was completed for the project area and White Mountain source area on April 13, 1999. On May 4, 1999, the willow source area along Sixes River was also surveyed. Significant cultural resources were not located in either source area or in the project area along the eroding bank in Edson Creek Recreation Site.

Port-Orford Cedar

The project site has been reviewed and no Port-Order cedar was found in the project area or the related donor sites.

Noxious Weeds

The Edson Creek site is located off of Highway 101, which provides the source for all visitors, fishermen, and principal users of the area. A great concern is the presence of at least 80 non-native species with significant populations in the area of several noxious weed species such as: Scotch and French Broom (*Cytisus* sp.), Gorse (*Ulex europaeus*), Tansy Ragwort (*Senecio jacobaea*).

Oregon Department of Agriculture (ODA) and the U.S. Forest Service (USFS) have had aggressive Gorse eradication programs in place for several years, however, large populations remain in the immediate area. For example, in cooperation with ODA, the USFS and BLM have biologically treated local Gorse populations with the gorse spider mite (*Tetranychus lintearius*). Additionally, tansy ragwort has been inoculated with the tansy flea beetle (*Longitarsus jacobaeae*).

Other aggressive non-native species of the area include: Foxglove (*Digitalis purpurea*), Himalayan Blackberry (*Rubus discolor*), Beach Grass (*Ammophila arenaria*), Japanese Fleecflower (*Polygonum cuspidatum*). The fertile soils and forgiving climate are very conducive to these fast-growing, non-native species. Most of these species have been introduced in the area through vehicle travel, construction equipment, historic overgrazing, timber harvest and other ground-disturbing activities.

SECTION IV - ENVIRONMENTAL CONSEQUENCES

Critical Element Evaluation of Each Alternative

This section describes the scientific and analytical basis for the comparison of the alternatives, and the probable consequences as they relate to the alternatives. The environmental consequences to critical elements of the elements of the human environment are outlined in the Table 1 below.

Table 1 : Environmental consequences to the critical elements of the human environment

Critical Element of the Human Environment	Present in the Project Area	Affected by No Action	Affected by the Proposed Action	Affected by Alternative 1
Air Quality	Yes	No	No	No
Area of Critical Environmental Concern	No	N/A	N/A	N/A
Cultural Resources	No	N/A	N/A	N/A
Farm Lands	No	N/A	N/A	N/A
Flood Plain	Yes	No	Yes	Yes
Native American Religious Concerns	No	N/A	N/A	N/A
Noxious Weeds	Yes	No	Yes	Yes
Port Orford Cedar Management	No	No	No	No
Threatened & Endangered Species (Wildlife)	Yes	Yes	Yes	Yes
Threatened and Endangered Species (Botanical)	No	N/A	N/A	N/A
Wastes; Solid or Hazardous	No	N/A	N/A	N/A
Water Quality; Drinking Water	Yes	Yes	Yes	Yes
Wetlands/Riparian Reserves	Yes	Yes	Yes	Yes
Wild and Scenic Rivers	No	N/A	N/A	N/A
Wilderness	No	N/A	N/A	N/A

Air quality is unaffected by No-action, Proposed Action, or Alternative I. The following elements are affected by either the No-action, Proposed Action or Alternative I: flood plains, noxious weeds, Riparian Reserves, water quality, and Threatened & Endangered Species (wildlife) .

Evaluation of Consistency with Sixes River Watershed Analysis - Proposed Action & Alternative I

The Sixes River Watershed Analysis (USFS, 1997) states that recreational uses are expected to increase in the Sixes basin, and that recreation trends (as noted in the 1993 Oregon State Comprehensive Outdoor Recreation Plan) indicate that demand for dispersed recreation use of various types is increasing, and this broad trend is concluded to be true for the Sixes River (p. S-10). Both the Sixes River and Edson Creek recreation sites are identified in the watershed analysis as existing recreation opportunities (p. S-9). Although the need for streambank erosion control in Edson Creek recreation site is not specifically addressed in the SRWA, the recognition of increasing recreational demands is consistent with the objectives of the Proposed Action and Alternative I (to protect and maintain existing recreation facilities). In addition, the streambank erosion control project is directly related to several management recommendations reported from the Sixes River Watershed Analysis (p. A-39).

Evaluation of Consistency with Northwest Forest Plan Standards and Guidelines - Proposed Action & Alternative I

The project in the recreation site would comply with the Standards and Guidelines of the ROD for the Northwest Forest Plan for existing recreation facilities within Riparian Reserves. The design features to minimize impacts to water quality and Riparian Reserves would be in accordance with the [RM-1] guidance for existing recreation sites to "...evaluate and mitigate impacts to ensure that these do not prevent, and to the extent practicable, contribute to attainment of Aquatic Conservation Strategy objectives"(p. C-34). As discussed below under "Consistency with the Aquatic Conservation Strategy", it was determined that the Proposed Action or Alternative I would not retard or prevent attainment of ACS objectives. In accordance with RM-2, adjusted recreation practices are incorporated into the project design: a fence will be constructed to establish a 20'-wide setback from the actively eroding stream bank and protect the structures and transplants.

Consistency with the Aquatic Conservation Strategy - Proposed Action

There are four components of the Aquatic Conservation Strategy: Riparian Reserves, Key Watersheds, Watershed Analysis, and Watershed Restoration (ROD, page B-12). The Proposed Action meets these four components by:

- ✧ The relevant watershed analysis is the Sixes River Watershed Analysis (USFS 1997).
- ✧ Edson Creek is not within a Key Watershed. Dry Creek is the only designated Key Watershed in the Sixes River analysis area - the relevant 5th field watershed.
- ✧ Watershed restoration in the Sixes River analysis area is addressed in the Sixes River Watershed Analysis, Appendix D. To date, only a portion of the identified in-stream (culvert replacement for fish passage in Little Otter Cr. and an unnamed tributary) and road-related (approximately 6.5 miles of decommissioning) restoration work has been

accomplished. The Powers Ranger District is in the process of planning other restoration work identified in the Sixes River Watershed Analysis.

- ✧ The Sixes River Watershed Analysis includes recommendations for the management of Riparian Reserves (pages A-38, A-39 & Appendix D). The design features contained within the Proposed Action are consistent with these recommendations and the pertinent Standards and Guidelines (ROD, C-30 - C-33). These "Standards and guidelines prohibit and regulate activities in Riparian Reserves that retard or prevent attainment of the Aquatic Conservation Strategy objectives" (ROD, page B-12).

The following table shows the relationships among the nine Aquatic Conservation Strategy (ACS) objectives, the measurable factors/indicators developed by National Marine Fisheries Service, and site-specific impacts of the Proposed Action.

Table 2 : The summary of Edson Creek Streambank Erosion Control design features, impacts of the Proposed Action on aquatic/riparian values within the Klamath Province Siskiyou Mountains Physiographic Area, Matrix of Factors and Indicators (Attachment 3 to the NMFS Biological Opinion, March 18, 1997), and assessment of consistency with the ACS objectives.

ACS Objectives Northwest Forest Plan	Factors/ Indicators (NMFS)	Edson Creek Streambank Erosion Control Design Features and Impact Analysis
2,4,8,9 Design features will maintain spacial and temporal connectivity within the drainage network with regard to shade and water temperature (ACS#2), maintain water quality with respect to temperature (ACS#4), maintain vegetation for adequate summer/winter thermal regulation for aquatic species (ACS#8), and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).	Water Quality / Temperature	Interim <u>Riparian Reserve (RR)</u> widths would be maintained on all streams within, and adjacent to, the project area; this is of sufficient width to maintain water temperature. No canopy will be cut, girdled, or otherwise disturbed in the Riparian Reserves, and there will be no direct effect on stream temperature. The proposed action may provide indirect beneficial effects to water temperature by reducing the width/depth ratio within the project area, thereby reducing solar warming.

ACS Objectives Northwest Forest Plan	Factors/ Indicators (NMFS)	Edson Creek Streambank Erosion Control Design Features and Impact Analysis
<p>4,5,6,8,9 Design features will maintain water quality (ACS#4) in the long term, temporarily degrade turbidity in the short term, but maintain the sediment regime in the long term (ACS#5), maintain instream flows to retain patterns of sediment routing (ACS#6), maintain vegetation to provide adequate rates of erosion (ACS#8), and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).</p>	<p>Water Quality / Sediment / Turbidity</p>	<p>Interim <u>Riparian Reserve (RR)</u> widths would be maintained on all streams within, and adjacent to, the project area. RR's encompass unstable and potentially unstable slopes where there is a chance for sediment delivery from mass wasting. RRs are sufficient to filter any sediments from adjacent slopes, prevent delivery to stream channels, and avoid downstream effects.</p> <p>The project is designed to reduce the potential for long-term sedimentation & turbidity from bank erosion and channel migration in the project area. However, elevated stream turbidity is likely during construction (2 weeks) and during the first freshet thereafter, due to suspension of fine sediments from the channel substrates. Turbidity during construction is likely to be above summer background levels. Turbidity associated with the first freshet/s subsequent to construction is expected to be within the present range of variability for the site. Short-term turbidity would be minimized by best management practices (BMPs) (water diversion, silt fencing/mats, seeding and mulching, and seasonal restrictions).</p>
<p>4,6,8,9 Design features will maintain water quality with regard to chemical concentration/nutrients (ACS#4), maintain instream flows to retain patterns of nutrient routing (ACS#6), maintain vegetation to provide adequate nutrient filtering (ACS#8), and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).</p>	<p>Water Quality / Chemical Concentration / Nutrients</p>	<p>Interim <u>Riparian Reserve (RR)</u> widths would be maintained on all streams within, and adjacent to, the project area; this is sufficient to maintain the natural input of organic material into streams by riparian vegetation.</p> <p>The proposed action involves the use of heavy equipment in immediate proximity to the stream channel. However, water quality will be maintained through implementation of the <i>Conservation Practices for Streams and Riparian Reserves #13</i> (Coos Bay District ROD, BMPs p. D-3). Furthermore, the contract will have requirements pertaining to water quality in connection with all construction (Contract Provisions Sec. 25), disposition of waste materials (Sec. 26), and handling of hazardous materials (Sec. 27) to prevent chemical entry into any surface waters.</p>
<p>2,9 These design features will maintain spacial and temporal connectivity within the drainage network (ACS#2) and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).</p>	<p>Habitat Access / Physical Barriers</p>	<p>The proposed project will not create physical barriers or otherwise degrade access to aquatic habitat, nor will it correct any existing barriers.</p>

ACS Objectives Northwest Forest Plan	Factors/ Indicators (NMFS)	Edson Creek Streambank Erosion Control Design Features and Impact Analysis
<p>3,5,6,8,9</p> <p>Design features will help restore the banks and bottom configurations of the aquatic system (ACS#3), temporarily degrade turbidity in the short term, but maintain the sediment regime in the long term (ACS#5), maintain instream flows to retain patterns of sediment routing (ACS#6), maintain vegetation to provide adequate rates of erosion, and to supply coarse woody debris sufficient to sustain physical complexity and stability (ACS#8), and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).</p>	<p>Habitat Elements / Sediment</p>	<p>Interim <u>Riparian Reserve (RR)</u> widths would be maintained on all streams within, and adjacent to, the project area. RR's encompass unstable and potentially unstable slopes where there is a chance for sediment delivery from mass wasting. RRs are sufficient to filter any sediments from adjacent slopes, prevent delivery to stream channels, and avoid downstream effects.</p> <p>The proposed actions would occur on stable, low-gradient areas. The project is designed to reduce the potential for long-term sedimentation from bank erosion and channel migration in the project area. The proposed design includes transplanting myrtle and willow trees and installing LWD revetments and boulder vanes to control bank erosion at the project site. Disturbed soils will be seeded and mulched to protect against transport of sediment to the stream channel during subsequent rains.</p>
<p>6,8,9</p> <p>These design features will maintain instream flows to retain patterns of wood routing (ACS#6), maintain vegetation to provide an adequate supply of coarse woody debris sufficient to sustain physical complexity and stability (ACS#8), and therefore maintain habitat for well-distributed riparian-dependent populations (ACS#9).</p>	<p>Habitat Elements / Large Woody Debris</p>	<p>Interim <u>Riparian Reserve (RR)</u> widths would be maintained on all streams within, and adjacent to, the project area. Therefore, the potential recruitment of large wood from debris torrents, landsliding, and windthrow will be maintained.</p> <p>The proposed action would not involve the removal of tress or LWD from the riparian area, but would add LWD to the project area and transplant trees streamside.</p>
<p>2,3,5,8,9</p>	<p>Habitat Elements / Pool Area (%)</p>	<p>The project design would introduce scour elements to promote a deeper thalweg, thereby enhancing pool area within the project area.</p>
<p>2,3,5,6,9</p>	<p>Habitat Elements / Pool Quality</p>	<p>The proposed actions are designed to promote a deeper thalweg and provide complex cover elements, thereby enhancing pool character and quality within the project area.</p>
<p>1,2,3,6,7,8,9</p>	<p>Habitat Elements / Off-Channel Habitat</p>	<p>The proposed actions involve work within the stream channel and adjacent flood-prone area. However, the project will not diminish LWD recruitment, accelerate sediment delivery, alter the flow regime, reduce the flood-prone area or impinge on its function; thus would not affect off-channel habitat.</p>

ACS Objectives Northwest Forest Plan	Factors/ Indicators (NMFS)	Edson Creek Streambank Erosion Control Design Features and Impact Analysis
1,2,3,5,6,8,9	Channel Condition & Dynamics / Width/Depth Ratio	The proposed actions are designed to control bank erosion and channel migration at the project site and reduce the width/depth ratio.
3,5,6,8,9	Channel Condition & Dynamics / Streambank Condition	The proposed design includes transplanting myrtle and willow trees and installing LWD revetments and boulder vanes to control bank erosion at the project site.
1,2,3,6,7,8,9	Channel Condition & Dynamics / Floodplain Connectivity	Although there is a potential for the recreation site to flood, the structures proposed would have minimal impacts on floodplain interactions and connectivity. The project will not reduce the flood-prone area or impinge on its function.
1,2	Watershed Condition / Road Density & Location	The proposed actions do not effect road density or location.
1,2,5,8,9	Watershed Condition / Disturbance History	The project is within an existing recreation site. Although the proposed actions would occur within a fish-bearing stream and adjacent Riparian Reserve, they will not disturb unstable or potentially unstable areas, or have long-term adverse impacts to aquatic refugia.
1,3,5,8	Watershed Condition / Landslide and Erosion Rates	Interim <u>Riparian Reserve (RR)</u> widths would be maintained on all streams within, and adjacent to, the project area. Riparian Reserves incorporate headwalls, and steep or otherwise sensitive side-slopes. The proposed action would occur on stable, low-gradient areas. See discussion for the Water Quality / Sediment / Turbidity factor/indicator.
1,2,4,8,9	Watershed Condition / Riparian Reserves	Interim <u>Riparian Reserve (RR)</u> widths would be maintained on all streams within, and adjacent to, the project area. The RR system will maintain shade, large wood recruitment, habitat protection and connectivity in the analysis area. The proposed actions would not involve the removal of trees from the riparian area. Myrtle and willow trees would be transplanted streamside within the project area.

Conclusion

The proposed project was determined to be consistent with Watershed Analysis recommendations and findings, applicable Northwest Forest Plan Standards and Guidelines, NEPA Documentation, and applicable aspects of NMFS' March 18, 1997 Biological Opinion (Appendix C). In addition, the proposed project would not hinder or prevent attainment of Aquatic Conservation Strategy objectives at the 5th field watershed scale over the long-term.

Consistency with the Aquatic Conservation Strategy - Alternative I

The alternative design to riprap the entire outside bend of Edson Creek would not hinder or prevent attainment of Aquatic Conservation Strategy objectives, however, it would not satisfy the objectives as favorably as the Proposed Action. Specifically, ACS objective number 3 is to maintain or restore the physical integrity of the aquatic system, including bank and bottom configurations (B-11). Under Alternative I, riprap would fix the present channel dimension in time instead of restoring the desired channel dimension with appropriate rates of channel migration and width/depth ratios. In addition, the use of riprap in Alternative I would harden the bank allowing for no erosion to occur, while the use of large woody structures as designed in the Proposed Action would establish "appropriate rates" of erosion as discussed in ACS objective 8 (B-11).

NO ACTION

Wildlife, Including T & E Species - Issue 1

Direct and Indirect Effects

Under this alternative the replacement of wildlife life habitat is not likely in the foreseeable future. It is expected that the streambank would continue to erode and possibly re-route the stream, or a portion of it, through the campground. Although this is likely to be very destructive to the recreation and fisheries resources in the long term it likely would provide a larger willow sp. complex community and would benefit many wildlife species. Implementation of this alternative is not expected to benefit Marbled Murrelets or any other Threatened or Endangered wildlife species.

Recreation Resources - Issue 2

Direct and Indirect Effects

A No-action alternative may result in the loss of three developed campsites and a vehicle turn around area in Edson Creek RS due to the continued erosion of Edson Creek bank. This is a major issue for visitors who repeatedly choose these sites. Site #20 is the first choice for many campers and is almost continuously occupied between Memorial Day and Labor Day. R1A and R1B are two of only four group sites and are used for small group camping. Group Reservation Sites are reserved 75% of the time between Memorial Day and Labor Day.

Continued lateral stream migration could also destroy the access road leading to the Group Reservation Sites where all four Group Reservation Sites would be inaccessible for camping purposes.

If Edson Creek continues to migrate and form a cutoff, the entire developed campground could potentially erode or become the new channel. BLM could not meet its goals in the District Resource Management Plan (p.49) and the Coos Bay District Recreation Plan to continue the operation and maintenance at this site.

Cumulative Effects

Taking No-action could result in the loss of developed campsites within the watershed that may not be possible to replace due to terrain and topography.

Aquatic Habitat/Fisheries, Including T & E Species

Direct and Indirect Effects

TURBIDITY/SEDIMENT DELIVERY

Under the No-action Alternative, bank erosion and channel migration at the BLM Recreation Site are likely to continue at approximately their present rates. There is low potential for sediment delivery/turbidity to streams to increase above existing high levels. Indirect effects of continued bank erosion include continued high turbidity and sediment deposition in downstream reaches (the lower mile of Edson Creek to the Sixes River and estuary). Depending on the timing and magnitude of future storm events, turbidity and sediment delivery from bank erosion and channel migration may result in further habitat modification, disruption of normal behavior patterns, injury or mortality of salmonids. Therefore, there is a substantial risk of additional impact to fish populations and aquatic habitat as a result of continued bank erosion at the BLM Recreation site on Edson Creek.

TEMPERATURE

No canopy will be harvested, girdled, or otherwise disturbed in the Riparian Reserves, and there will be no direct effect on stream temperature under any of the alternatives. Under the No-action Alternative, additional shade trees may be lost to continued bank erosion.

LARGE WOODY DEBRIS

The No-action Alternative will not directly effect large woody debris in the Edson Creek drainage. Indirectly, there may be additional recruitment of hardwood debris as existing stream-side trees are undercut by bank erosion.

Cumulative Effects

Cumulative effects of past land management (including harvest, salvage, road construction, and recreation) have already contributed to the "at risk" status of fish stocks and poor stream habitat condition in Edson Creek. The No-action Alternative is likely to maintain or aggravate these conditions.

Hydrology

Direct and Indirect Effects

The streambank will continue to erode, perpetuating sedimentation effects downstream and compromising water quality. The bank is retreating 10-40 feet each winter, entraining an estimated 1000-5000 yd³ of river alluvium. Recreational camping sites on an adjacent wide floodprone area are being reduced in size or eliminated.

The stream is regressing toward a straighter, steeper, wider, shallower and braided stream (Rosgen D4 channel type). This is an unstable and high sediment-producing channel type, which may not meet water quality or fisheries objectives. The 1964 flood event and removal of streamside large riparian hardwood and conifer trees in the past is largely responsible for the increased lateral migration of the stream and loss

of pool riffle channel (Rosgen C4 channel type) equilibrium. Field-collected data confirms these observations.

Cumulative Effects

Downstream pools in the Sixes River, below the confluence with Edson Creek have been losing depth in recent years. Although the Sixes River has a naturally high coarse and fine sediment load, the high sediment supply from Edson Creek may be a factor in the concurrent channel changes in the main river.

Vegetation, Including T & E Species

Direct and Indirect Effects

Bank cutting and loss of the riparian vegetation would continue to occur if the no action alternative was selected. Specifically, a few mature myrtlewood trees would be lost along with forbs, shrubs, and epiphytic species. Thus, botanical resources would decline at the recreation site.

Cumulative Effects

The potential natural community for the project site may include an overstory of mixed myrtlewood, red alder, big leaf maple (*Acer macrophyllum*), and some conifer species. Continued accelerated stream wandering would undermine mature hardwoods (already in short supply) and retard establishment of a mature riparian forest. This may perpetuate an unshaded stream condition and higher stream temperatures through the site and downstream. Continual loss of the streambank would result in further loss of riparian habitat and decrease potential habitat for vascular plants, bryophytes, fungi, and lichens.

Soils

Direct and Indirect Effects

Continued removal of the river bank at periods of high runoff will continue to occur at this site. The lateral and downstream removal can be expected to continue because this soil type has no ability to resist the force of the water at the higher flows. As larger sized rocks are unearthed from the bank margins the streambed may become armored with them. This protective layer prevents further downcutting of the channel at the expense of the stream banks. There is little if any binding strength to the Logsdon soil type, and the toe of the bank constantly erodes even at bank full stages. The extension of the lateral movement can be expected to continue until the bend is sufficiently wide to disperse the stream energy at the higher flows or a meander cutoff occurs.

Indirectly this constant removal of bank materials increases the bedload and suspended sediment into the mainstem of Sixes River. This river system is one that normally moves a high amount of both fine and coarse sediment materials at high flows. Allowing the Edson Creek banks to continue to erode will add the high sediment load and perpetuate these conditions.

Cumulative Effects

Following this course of action may degrade the stream function by allowing it to become wide and shallow with multiple watercourses instead of one streamcourse. Increased downstream removal may occur as the velocity of high runoff events continue to scour away at the existing bank. Sediment from this action will keep turbidities in Edson Creek and Sixes River high.

Hazardous Materials

There are no environmental consequences for hazardous material or solid waste under the No-action alternative.

Cultural Resources

There are no environmental consequences for cultural resources under the No-action alternative.

Port-Orford Cedar

There are no environmental consequences for Port-Orford cedar under the No-action alternative.

Noxious Weeds

Direct and Indirect Effects

The No-action alternative has direct and indirect effects on the additional spread of non-native invasive populations. Invasive species favor disturbed sites and consequently would be given greater opportunity and space over time to expand current populations of the area.

Cumulative Effects

Additional populations of noxious weeds and other non-native aggressive plant species adjacent to a flowing water source and vehicles would provide an opportunity to further spread down stream and throughout the watershed. The additional spread of non-native species may potentially invade remote locations leading to a greater contamination of the overall plant community health and diversity.

PROPOSED ACTION - BIOENGINEERING RESTORATION DESIGN

Wildlife, Including T & E Species - Issue 1

Direct and Indirect Effects

The specific design is likely to provide some wildlife habitat where it has been removed by past activities. The proposal identifies 16" diameter conifer root wads and logs for instream and bank structures. Above surface logs and rocks are often used by birds and aquatic mammals for perches, foraging structures or haul out sites, however these may also be used as anchor points for beaver (*Castor canadensis*) to build against or upon. Structures should be constructed and placed in such a way that if beaver do build on them, no unanticipated hydrological result occurs. The source of rock is from a private quarry and would not adversely impact Federally administered lands. Source materials for the log and root wad vanes are identified from BLM administered lands on White Mountain. Eighteen live conifer trees have been selected along the road right of way and are not expected to adversely effect wildlife or their habitats. The conifer donor site is within an unsurveyed but suitable Marbled Murrelet

(BRMA) habitat site, however none of the trees selected are suitable or are affecting suitable nest trees for BRMA. The removal of these trees is not considered a "may effect" action for loss of habitat.

This alternative is not expected to adversely effect Marbles Murrelets or any Threatened or Endangered wildlife species, provided the daily timing restrictions are implemented. No further wildlife consultation under Section of the Endangered Species Act is needed for this proposed action (consultation was completed via BO #1-7-98-F-079, 1997). Source material and project proposal sites on federally administered lands have been evaluated and /or surveyed for Red Tree voles, Del Norte Salamanders, and survey and manage molluscs according to the appropriate protocols. None of these species is expected to be adversely impacted by implementing this proposal.

DESIGN RECOMMENDATIONS

- ✧ use daily timing restrictions,
- ✧ proper selection of willow stock size,
- ✧ willows should be extracted in small clumps, and
- ✧ proper timing for the planting of willow stock.

Recreation Resources - Issue 2

Direct and Indirect Effects

Implementation of this alternative would protect and maintain camping opportunities. The following resources would be protected from lateral stream migration: a vehicle turnaround area, campsite #20, Group Reservation Sites R1A and R1B, and an access road leading to the Group Reservation area.

Disturbance to visitors can be minimized by avoiding construction during the heaviest use periods from Fridays through Sundays. Construction should also be avoided in the early morning hours before 8am and evening after 6pm.

Cumulative Effects

Taking the Proposed Action will enable continued use of the campground and sites #20, R1A, and R1B.

Aquatic Habitat/Fisheries, Including T & E Species

Direct and Indirect Effects

TURBIDITY/SEDIMENT DELIVERY

Elevated stream turbidity is likely during construction and during the first freshet thereafter due to suspension of fine sediments from the channel substrates. These are expected to be short-term pulses. The turbidity pulse during construction may stress juvenile salmonids in the vicinity of the project, especially if it coincides with high summertime water temperatures. Turbidity associated with the first freshet/s subsequent to construction is expected to be within the present range of variability for the site, thus not likely to cause additional impacts to salmonids.

TEMPERATURE

No canopy will be harvested, girdled, or otherwise disturbed in the Riparian Reserves, and there will be no direct effect on stream temperature under this alternative. The proposed action may provide indirect

beneficial effects to water temperature by reducing the width/depth ratio within the project area, and transplanting trees, thereby reducing solar warming.

LARGE WOODY DEBRIS

This alternative would provide direct beneficial effects to LWD and the associated instream habitat values by incorporating rootwads and tree boles in the design.

Cumulative Effects

The installation of the erosion control structures is likely to contribute to long-term stability of the point bar on the opposite bank, which will, in turn, support botanical succession and riparian development in the project area. However, until the causal agents are addressed bank erosion upstream and downstream of the project area are likely to continue, resulting in a chronic loss of vegetation.

The techniques proposed in the Rosgen-type design have proven effective in similar stream types elsewhere, and are likely to control bank erosion and channel migration at the project site. This alternative is also expected to enhance aquatic habitat in the immediate vicinity of the project, by creating much needed deep-pool habitat, adding complex cover (LWD), and reducing the width/depth ratio.

Previous NEPA documentation (EA #OR128-97-28) states that within the project area, "the channel is continually changing laterally under the influence of high flows," and further indicates that "this is a very unstable environment in which to place a structure." The bank erosion and channel migration at the Edson Creek Recreation Site are most likely the result of accelerated sediment delivery and an elevated flow regime, which stem from past harvest and road-building activities. Edson Creek is responding to the sediment load and flow by adjusting its channel dimension, pattern and profile. The bank erosion and channel migration are symptoms, not the underlying problem; but are perceived as problematic, primarily because they impact recreation and transportation. Although none of the alternatives address the causative agents, this alternative provides the best "symptomatic relief" for the bank erosion and channel migration at Edson Creek, by working with the natural fluvial processes to restore some level of aquatic habitat function while providing for continued recreation and transportation at the Recreation Site.

Hydrology

Direct and Indirect Effects

Use of rock and log vane structures, and aggressively transplanting vegetation on the upper banks will dramatically slow the lateral migration of the stream. This in turn will cause the point bar on the opposite side of the stream (inside bend) to advance toward the outside bend until the bankfull width is in balance with the discharge and sediment load. This new bankfull width has been calculated to be about 45 feet. Current bankfull width is between 65-85 feet. Pool depths (measured down from the bankfull elevation) will increase from 4-5 feet to 8-11 feet. The dimension of the channel will change as indicated, but the pattern and profile of the channel should remain near current parameters. The sinuosity (measure of the meandering of a channel) should remain near 1.4, and the stream gradient should remain near 0.9%, except for pools which will have a lower slope. Important hydraulic parameters will be within the range of a stable pool/riffle C4 channel type. Bank planting with indigenous riparian species will eventually provide root mass and bank control points along the margins

of the stream. Riparian vegetation will keep channel migration within ranges of a reference stream of this channel type. Also, this action will not effect the floodplain connectivity of the stream.

Conifer log and rootwad material taken from the White Mountain donor site near Flora Creek is from ridge locations along existing roads, outside of any Riparian Reserves. There should be no sediment delivery to channels of effect on water resources.

Cumulative Effects

The rock and log vanes are temporary measures (effective years to decades) to slow active streambank migration, allowing riparian vegetation to become established, mature, and provide significant root strength and coarse wood recruitment. These bioengineering measures should provide short and long term stability to maintain a pool/riffle channel in balance with the discharge and sediment load.

Vegetation, Including T & E Species

Direct and Indirect Effects

The proposed action would lead to stabilization of the streambank. Using tree root wads with boles attached would provide natural substrates to promote some botanical species. The planting of willows (*Salix* spp), myrtlewood trees, and other native shrubs and trees would directly increase botanical abundance and indirectly provide future habitat for epiphytic species and stable ground for botanical species.

Loxosporopsis corallifera, a component 1 & 3 crustose lichen, was found on sixteen of the eighteen trees proposed for removal. In this analysis, a single tree is used to define an individual of *Loxosporopsis corallifera*; even though, a tree can contain many patches of this lichen. A rule for managing plant populations states that if 5% or less of a species' population is removed than the impact to the population should be negligible (Wagner, 1991). From the surveys, it can be confidently said that a population of least 320 trees with *Loxosporopsis corallifera* exists around these 16 selected trees. Under the assumption that this 1-in-20 rule can be applied to a crustose lichen, it can be inferred that the removal of sixteen trees with *Loxosporopsis corallifera* should have negligible impacts to its population.

Ulota megalospora, a protection buffer moss, was found on one shrub at the roadside location where fourteen Douglas-fir trees would be removed. These trees are scattered along the edge of the forest and falling should not interfere with the rooting structure of the shrub on which the moss was found. Due to the openness of the forest that parallels the road and the relatively short height of the trees, it would be expected that damage to the understory would be very minor and patchy. The potential risk to the moss and its habitat should be small.

Cumulative Effects

This action would maintain substrate for vascular plants and provide future substrate for epiphytic species; thus, promoting botanical diversity at the project site. The planting of native plants would help discourage the establishment of the exotic plant species.

The removal of proposed trees for instream structures would decrease the *Loxosporopsis corallifera* population by 18 "individuals" (5% or less of the overall local population), creating minimal negative impacts to the persistence of this lichen. However, future management of this species across BLM land and the White Mountain area should address this issue as "a taking of the species". Because *Ulota*

megalospora was not found on a tree and due to its exact location, there should be no cumulative negative impacts of this proposed action on this moss or its habitat.

Soils

Direct and Indirect Impacts

Pursuing this course of action will contribute to increased turbidities during the project work as well as during the first high flow events of the fall and winter. The turbidity that comes from the materials placed on the point bar or the initial removal of fine sediment at high flow events will be lower than what is being created by bank erosion on site. Increased sediment delivery in the fall and winter will be within the observed variation for this drainage and the larger Sixes River system downstream.

Retarding the erosion from this site will increase the quality of the water within Edson Creek. Stability of the banks will be improved by the placement of root wads anchored into the bank by the connected boles.

Sediment delivery to the stream channels from the donor tree or willow sites is expected to be negligible. Approximately twenty trees will be removed from four different roadside locations within the White Mt. area. The rooting depth of the trees is roughly 24 to 30 inches based on other windthrow in the immediate area. Ground disturbance from the tipping and dragging actions will not produce adverse sediment effects. Some minor additions of sediment will occur to the ditchlines adjacent to the road system. The delivery of this material to the stream network during a runoff event is expected to be low. Adequate filtering within the ditches is present at this time. The removal of the boles and root structures will not effect the long term productivity of the conifer donor site since only a small proportion of the total number of trees would be taken in this manner.

DESIGN RECOMMENDATIONS

- ✧ isolate the project area from the running stream water when working in or adjacent to the stream,
- ✧ control the release/mixing of turbid water from the site back to the stream in such a manner that no visible plume extends for more than 100 feet downstream,
- ✧ use hardened rock for all instream or streambank protection work, and
- ✧ all branches, limbs and needles should be left on site at the conifer donor site to withhold the nutrients within the immediate area.

Cumulative Effects

This action should reduce the bank erosion and lateral movement at this site. Over time, the vegetation will provide bank stability necessary to weather the flood events that occur at this site. Stable stream position will enable continued use of the campground for recreation, which is presently being threatened by the erosion. Reduced sediment delivery into Edson and Sixes River will improve water quality downstream.

Hazardous Material

DESIGN RECOMMENDATIONS

- ✧ any instream or streamside work involving heavy equipment is subject to State and Federal Law governing petroleum spill prevention and cleanup including; Oregon Administrative Rules (OAR) 340, Division 108, Oil and Hazardous Materials Spills and Releases (DEQ), and OAR 629-57-3600, Petroleum Product Precautions, Oregon Forest Practices, and
- ✧ contractors or operators should be made aware of the BLM Coos Bay District Spill Plan in effect for riparian operations, and it should be followed in the event of any release of petroleum or hazardous materials.

Cultural Resources

It is not expected that cultural resources will be affected by the Proposed Action. However, if cultural resources are observed during project activities, work must stop and the District Archeologist notified.

Port-Orford Cedar

The Proposed Action has no direct, indirect, or cumulative effect on the viability of Port-Orford cedar (POC) as a species. The project site, associated source sites and adjacent lands are free of POC, Pacific yew, and *Phytophthora lateralis* (Port-Orford cedar root rot). Therefore, there would be no effect on downstream populations of POC from this action.

RECOMMENDATIONS

- ✧ in order to prevent *Phytophthora lateralis* (Port-Orford cedar root rot) spores from entering the streamcourse, require equipment washing prior to entering BLM lands,
- ✧ ensure the source of willow transplants and root wads is away from the presence of POC, Pacific yew, and *Phytophthora lateralis* diseased trees, and
- ✧ ensure rock source is not adjacent to any POC, Pacific yew, or *Phytophthora lateralis* diseased trees, and wash rock before placement.

Noxious Weeds

Direct and Indirect Effects

The proposed action will stabilize the bank and prevent additional exposed area for plant invasions to take place. Additionally, post management control would insure that the general area is not likely to have initial populations becoming epidemic in nature. Aquatic Conservation Strategies objectives 1, 8, and 9 (Interagency, 1994) would be supported by controlling the exotic populations of vegetation. Consequently, the proposed project would maintain species composition and structural diversity of plant communities.

The donor sites would have direct and indirect effects on the additional spread of non-native invasive populations. Invasive species favor disturbed sites and consequently would be given greater opportunity and space over time to expand current populations of the area.

DESIGN RECOMMENDATIONS

- ✧ ensure that all construction equipment used is washed prior to entering any BLM land,
- ✧ post management/monitoring includes noxious weed control at a minimum of once per year,
- ✧ remove any noxious weeds in the immediate construction area before construction takes place,
- ✧ use rock that comes from a weed free source,
- ✧ use weed free seed/hay/straw for re-vegetation operations,
- ✧ restore the disturbed areas at the donor sites, and
- ✧ be aware of noxious weeds leading to the site and on the site. Make note of species.

Cumulative Effects

The proposed action should reduce the access of the project area and related donor sites to noxious weeds. This will result in maintaining a weed free area that won't contribute to the spread of existing populations either by down stream flows or vehicular travel.

ALTERNATIVE I - RIPRAP DESIGN

Wildlife, Including T & E Species - Issue 1

Direct and Indirect Effects

This alternative is expected to substantially limit the ability of the adjacent willow stand to sustain itself over time, because it will limit the potential of the wetted perimeter to function. Willows may eventually establish within the Rip-rap, helping to armor the site while providing some avian wildlife habitat. Willows would not be expected to re-establish away from direct contact with the water resources. The rock will limit the ability for herbaceous vegetative habitats to establish within the riparian area and will limit the occupation by the full array of wildlife species expected for the site.

This alternative is expected to provide the smallest benefit to wildlife or their habits of the three proposed alternatives for this project.

This alternative is not expected to adversely effect Marbles Murrelets or any Threatened or Endangered wildlife species, provided the daily timing restrictions are implemented. No further wildlife consultation under Section of the Endangered Species Act is needed for this proposed action (consultation was completed via BO #1-7-98-F-079, 1997). Source material and project proposal sites on federally administered lands have been evaluated and /or surveyed for Red Tree voles, Del Norte Salamanders, and survey and manage molluscs according to the appropriate protocols. None of these species is expected to be adversely impacted by implementing this proposal.

Recreation Resources - Issue 2

Direct and Indirect Effects

The benefits of this alternative are the same as the Rosgen Stream Channel Design alternative. The same considerations regarding time of construction should be followed.

Cumulative Effects

Taking action under Alternative 1 will enable continued use of the campground and sites #20, R1A, and R1B.

Aquatic Habitat/Fisheries, Including T & E Species

Direct and Indirect Effects

Elevated stream turbidity is likely during construction and the first freshet thereafter due to suspension of fine sediments from the channel substrates. These are expected to be short-term pulses. The turbidity pulse during construction may stress juvenile salmonids in the vicinity of the project, especially if it coincides with high summertime water temperatures. Turbidity associated with the first freshet/s subsequent to construction is expected to be within the present range of variability for the site, thus not likely to cause additional impacts to salmonids.

This alternative is likely to arrest bank erosion at the project site, but would not enhance aquatic habitat.

TEMPERATURE

No canopy will be harvested, girdled, or otherwise disturbed in the Riparian Reserves, and there will be no direct effect on stream temperature. This alternative may provide some indirect beneficial effects to stream temperature as transplanted trees grow to provide shade to the stream channel.

LARGE WOODY DEBRIS

This alternative will not effect large woody debris in the Edson Creek drainage, or enhance the future recruitment of LWD.

Cumulative Effects

Armoring channels with rip-rap tends to transfer rather than dissipate energy, often with unpredictable results. Most commonly, the stream's energy is merely redirected toward the banks immediately downstream of the treated reach, resulting in more bank erosion and channel migration. Thus, the Alternative action may perpetuate the very process it was designed to treat and necessitate additional erosion control work in the future.

Hydrology

Direct and Indirect Effects

Riprap placed along the bank will dramatically slow the lateral migration of Edson Creek. However, if not keyed below the thalweg (deepest part of the channel, along the bank in a bend) some of the riprap could be undermined and erode the bank. Pools tend to be shallower than normal, because there is no in channel structure to cause helical flow and channel deepening. Transverse circulation is still in operation towards the point bar, but flow lacks sufficient concentrated energy to deepen the channel. Large rock without large wood structure lacks sufficient variability and mass for complex fish and aquatic structure. Riprap is not esthetically pleasing. Riprap will retard vegetation along the banks.

Cumulative Effects

If too much channel is lined with boulders, the stream will retain too much energy and erode streambanks downstream. This effect could perpetuate the stream system in disequilibrium.

Vegetation, Including T & E Species

Direct and Indirect Effects

This alternative would lead to stabilization of the stream bank by using rock material. The planting of willows and myrtlewood trees would directly increase botanical abundance and indirectly provide future habitat for epiphytic species and provide stable ground for botanical species. The shaping and backfilling of the bank would disturb the immediate vegetation, but the effects would be negligible on diversity because the banks are currently depauperate, containing small amounts of exotic grasses, Himalayan blackberry, and a few other species.

Cumulative Effects

This action would maintain substrate for vascular plants and provide future substrate for epiphytic species; thus, promoting botanical diversity at the project site. Planting of native species would help discourage the establishment of exotic plant species.

Soils

Direct and Indirect Impacts

This action would contribute sediment during the course of the project and require the same isolating design features as the proposed action. The delivery of sediment would be confined to the duration work. Additional sediment from the first high flow event would also occur, but the amount of material would be less than what is expected for the proposed action. The impacts and design recommendations from doing this project are the same as the proposed action.

Cumulative Impacts

The expected impacts listed for the proposed action pertain to this action as well.

Hazardous Material

This alternative has the same environmental consequences as the Proposed Action.

Cultural Resources

It is not expected that cultural resources will be affected by the proposed action. However, if cultural resources are observed during project activities, work must stop and the District Archeologist notified.

Port- Orford Cedar

This alternative has the same environmental consequences as the Proposed Action.

Noxious Weeds

This alternative has the same environmental consequences as the Proposed Action.

SECTION V - LIST OF AGENCIES

LIST OF PREPARERS AND CONTRIBUTORS

LITERATURE CITED

HYDROLOGIC DEFINITIONS

List of Agencies

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Hydrologic Definitions

ALLUVIAL DEPOSIT - sediment deposited by the action of running or receding water.

BANKFULL - the incipient elevation on the bank where the flooding begins.

BEDLOAD - material moving on or near the stream bed by rolling or sliding with brief excursions into the flow three or four diameters above the bed.

BRAIDED RIVER - a wide and shallow river channel where flow passes through a number of small interlaced channels separated by bars.

CONFLUENCE - a flowing together of two or more streams or the junction of those streams.

MEANDER - one of a series of sinuous curves, bends, or loops produced in the floodplain of a mature stream.

ROSGEN C CHANNEL TYPE - channel types that have a well developed floodplain (slightly entrenched), are relatively sinuous with a channel slope of 2% or less and a bedform morphology indicative of a riffle/pool configuration.

ROSGEN D4 CHANNEL TYPE - a channel type uniquely configured as a multiple channel system exhibiting a braided pattern with a very high channel width/depth ratio, and a channel slope generally the same as the attendant valley slope.

SINUOSITY - a term indicating the amount of curvature in the channel.

SHEAR STRESS - frictional force per unit of bed area exerted on the bed by the flowing water. An important factor in the movement of bed material.

THALWEG - the line connecting the lowest or deepest points along a stream bed, valley, or reservoir, whether underwater or not.

TURBIDITY - an expression of the optical properties of a sample which causes light rays to be scattered and absorbed rather than transmitted in straight lines through a sample. Turbidity of water is caused by the presence of suspended and dissolved organic matter such as clay, silt, finely divided organic matter, plankton, other microscopic organisms, organic acids and dyes.

WETTED PERIMETER - the length of the wetted contact between a stream of flowing water and its containing channel, measured in a direction normal to the flow.

WIDTH/DEPTH RATIO - the bankfull width of the stream channel divided by the mean depth of the stream