Martin Creek
Instream Restoration

Environmental Assessment
SOUTH RIVER FIELD OFFICE
EA # OR-105-03-05

U.S. Department of the Interior, Bureau of Land Management
Roseburg District Office
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Chapter 1
PURPOSE AND NEED FOR ACTION

This chapter describes the background, purpose, and need for the action being proposed and analyzed in this environmental assessment (EA).

I. Background

Watershed restoration is one of the four components of the Aquatic Conservation Strategy, as described in the Roseburg District *Record of Decision and Resource Management Plan* (USDI, BLM 1995b (ROD/RMP)). "Watershed restoration will be an integral part of a program to aid recovery of fish habitat, riparian habitat, and water quality." (ROD/RMP, p. 21)

Martin Creek, a major tributary to Middle Creek, runs through Section 35 of T. 31 S., R. 7 W., and Sections 1, 2, 12 and 13 of T. 32 S., R. 7 W. Middle Creek is designated as a Tier 1 Key Watershed in the ROD/RMP (p. 20). The purpose of Tier 1 Key Watersheds is to ". . . contribute directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species. They also have a high potential for being restored as part of a watershed restoration program."

Martin Creek was specifically identified in the Lower Cow Creek Watershed Analysis and Water Quality Restoration Plan (USDI, BLM 2002 pp. 170-171) as a potential restoration opportunity. Aquatic Habitat Surveys conducted by Oregon Department of Fish and Wildlife have identified low volume of large woody debris and few pieces of large woody debris along with few pool components (ODFW 1993).

With regards to habitat for coho salmon, the South Coast-Northern Klamath Late-Successional Reserve Assessment (USDA, USDI 1998) identifies the need for " . . . complex habitats which include pools for resting, rearing and feeding, and gravel dominated riffles for spawning (p. 56)." It also identifies instream restoration as a management activity appropriate for LSRs (p. 88).

II. Purpose

The purpose of the project would be restoration of access to spawning and rearing habitat in Martin Creek for resident and anadromous salmonids, creation of additional habitat, and enhancement of existing habitat. This would be accomplished by the replacement of a culvert that blocks most fish passage, and the addition of large wood and boulder structures to the stream channel. The structures would increase deposition and scour adjacent to the structures, allowing for the formation of deep pool and off channel habitat. This habitat would provide juvenile fish with slow-water rearing areas and deep, residual pool habitat during low flow periods.

III. Need

There is a need for the proposed instream restoration work to meet the Aquatic Conservation Strategy objective to "restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands (RMP/ROD, p. 19)." It is also needed to implement Management Direction from the ROD/RMP, and the recommendations from watershed analysis and the South Coast-Northern Klamath Late-Successional Reserve Assessment (LSRA).

Implementation of those portions of the project which are located on Federal lands would conform to the Management Direction of the ROD/RMP, as amended by the *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (USDA, USDI 2001). The ROD/RMP incorporates the analysis contained in the *Roseburg District Proposed Resource Management Plan/Environmental Impact Statement* (USDI, BLM 1994). Both documents incorporate the standards and guidelines of the *Final Supplemental Environmental Impact Statement* (FSEIS) *on Management of Habitat for Late-Successional and Old-Growth Related Species Within the Range of the Northern Spotted Owl* (USDA, USDI 1994a) and the *Record of Decision for Amendments* (ROD) *to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (USDA, USDI 1994b), otherwise known as the Northwest Forest Plan.

Portions of the project to be implemented on private land would be conducted in accordance with all State and local regulations, including but not limited to those of the Oregon State Division of Lands, Oregon Department of Forestry, and Oregon Department of Fish and Wildlife.

Chapter 2
DISCUSSION OF THE ALTERNATIVES

This chapter describes the basic features of the alternatives being analyzed in this environmental assessment.

I. Alternative One –Proposed Action

The portion of Martin Creek proposed for instream restoration is approximately 2 miles long. Approximately 75 percent of the lands astride the creek are under BLM administration. In Section 35 of T. 31 S., R. 7 W., the creek passes through lands administered by the BLM, and others owned and managed by Roseburg Resources Company (RRC). Roseburg Resources Company owns the lands astride the creek where it passes through Section 2 of T. 32 S., R. 7 W. Lands astride the stream in Section 1 of T. 32 S., R. 7 W. are entirely under the administration of the BLM. All BLM-administered lands in the project area are allocated to Late-Successional Reserves (LSR).

According to the Oregon Department of Fish and Wildlife, the desired number of key pieces of large instream wood stream is 3 or more per 100 meters, or approximately 1 piece per 100 feet of stream channel (Foster et al. 2001). Key pieces are defined by ODFW as being greater than 24 inches in diameter and greater than 32 feet long. Placement of a large number of key pieces of wood throughout the reach has a greater potential to beneficially alter reach-scale hydrology than placement of a few isolated structures (Keim et al. 2000).

The project would involve the placement of instream structures on private and federally-managed lands at approximately 120 locations. The structures would consist of either single or multiple logs, boulders, or combinations of logs and boulders. The structures would be designed to allow for fish passage. The number would approximate "desirable" numbers found in least-impaired reference streams.

Roseburg Resources Company would provide approximately 50 cull logs for use as structures, where Martin Creek passes through the company's lands. In 1996-97, RRC installed about 10 structures in the lower 700 feet of Martin Creek in Section 35, just above its confluence with Middle Creek. A portion of the logs would be used to supplement existing structures in the upper half of this area. The logs would be positioned with an excavator, using existing tractor skid roads for access. From this area, approximately 700 feet upstream to the property line, and for the portion of the stream in Section 2 of T. 32 S., R. 7 W., logs would be yarded to the stream and positioned using cable and blocks.

Where Martin Creek passes through BLM-administered lands, structures would be constructed of boulders or logs. Boulders would be 1/3-1 cubic yard in size. Logs used for structures would be provided by trees 18-30 inches in diameter breast height (DBH). Logs would be at least 40 feet long, or approximately twice the bankfull stream width. Approximately 150 trees would be felled in the riparian corridor (320 feet from either side of the stream) in the immediate project vicinity to provide the required number of logs.

To the extent practicable, structures would be placed to interact with the channel during low as well as high stream flows. Some structures may be placed to encourage the creation of off-channel habitat. Large structures would not be placed in incised areas with a potential for severe bank erosion.

In order to keep key pieces in place, structures would be placed off of the bank, or weighted down by other logs, so that their mass would overcome buoyancy forces at flood flows. Structures would be designed to remain in place and function for 25-50 years, to be eventually replaced by the natural recruitment of large wood from adjacent riparian and upstream areas.

In 1984, gabion baskets, which have since failed in 1996, were placed in an 800 foot stretch of stream in Section 35. They would be removed and replaced with boulders or logs.

Boulder structures would be installed with an excavator. Log structures would be installed using an excavator, where practical. Six temporary access points, 50-500 feet in length, have been identified. These would be blocked to any vehicular access following structure placement. Where access for an excavator is not available, logs would be winched into place and positioned with cable and blocks.

In addition to structure placement in Martin Creek, a culvert on Road No. 32-7-1.2 would be replaced. The culvert provides a crossing over a tributary of Martin Creek, in the SW¼ SE¼ of Section 1. Replacement of the culvert would reestablish access for coho salmon to an additional mile of spawning and rearing habitat in this tributary stream.

All instream work would implement appropriate Best Management Practices contained in Appendix D of the ROD/RMP, and Reasonable and Prudent Measure 2 found in the October 18, 2002 Programmatic Biological and Conference Opinion with NOAA Fisheries (USDC, October 18, 2002).. Instream work would be conducted under Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources published by the Oregon Department of Fish and Wildlife (ODFW 1997).

II. Alternative Two – No Action

Under this alternative, no instream habitat improvement or restoration of access to habitat would be conducted. Structures would not be added to Martin Creek on either private or federally managed land. Gabion baskets that failed in 1996 would not be removed and the stream-crossing culvert on the tributary of Martin Creek would not be replaced.

III. Alternatives Considered but Eliminated from Detailed Analysis

During the Interdisciplinary Team (IDT) process, additional alternatives were proposed that would alter the implementation but not the overall effectiveness of the project.

One alternative would have involved the purchase of logs from timber companies, rather than the felling of trees on BLM-administered lands. Besides being more costly, it would not be

consistent with the purpose and intent for the management of riparian areas and LSRs. Large trees within riparian areas are intended to provide a long-term source of large wood for aquatic habitat. Similarly, large trees within the LSRs are intended to provide habitat for both terrestrial and aquatic wildlife. The use of trees within the riparian areas and LSRs for the purpose proposed in this analysis is consistent with the intent of both the ROD/RMP and the LSRA.

Using a helicopter to place logs instream was considered as an alternative to cable yarding and/or placement with an excavator. The use of a helicopter was considered impractical because:

- Helicopter placement would greatly increase the cost of implementing the project and require the expenditure of funds that could otherwise be applied to other restoration projects.

- A helicopter could not place logs as precisely as an excavator or cable system.

- Rotor wash from a large helicopter would likely result in limbs being knocked out of tree tops. This would be detrimental to wildlife that may nest in larger trees, and would also preclude any individuals on the ground from directing the placement of logs because of safety concerns.

IV. Resources That Are Not Present or Would Not Be Affected by Either Alternative

The following resources would not be affected by either of the alternatives, because they are absent from the area: Areas of Critical Environmental Concern (ACEC); prime or unique farmlands; floodplains; and Wild and Scenic Rivers. No Native American religious concerns, environmental justice issues, or solid or hazardous waste were documented in the project area.

No effects on cultural and historic resources, or the introduction of noxious weeds or the spread of established weed infestations would be anticipated, as discussed in Chapter 3 of this document.

Neither of the alternatives would have any adverse energy impact. No known commercially viable energy resources exist in the project area, and there are not any production, transmission or conservation facilities that would be affected.

Chapter 3
AFFECTED ENVIRONMENT

This chapter summarizes the specific resources that are present or have the potential to be present within the area, and that could be affected by the proposed action.

I. Water Quality/Resources

The watershed has a Mediterranean type of climate characterized by cool, wet winters and warm, dry summers. Peak stream flows occur from November to March, and low stream flows occur from July to October. Based on regional curves for the South Umpqua River Basin (Kuck 2000), bankfull flow is estimated at 150 – 250 cubic feet per second (cfs) for the portion of Martin Creek in which the instream work is proposed.

Water quality standards are determined for each water body by the Oregon Department of Environmental Quality (ODEQ). These standards are designed to protect each water body for its most sensitive beneficial use. Streams which fail to meet standards for the identified beneficial use are placed on 303(d) list of Water Quality Limited Water Bodies.

For Martin Creek, the most sensitive beneficial use is for resident fish and aquatic life, and for salmonid spawning and rearing. Martin Creek does not meet water temperature standards and is listed on the State 303(d) list (ODEQ 1998). Elevated water temperatures are likely the result of past timber harvest adjacent to the stream. Along the proposed project reach, approximately 2/3 is heavily shaded by areas in which old-growth timber remains, while shading is moderate to low elsewhere.

The stream-crossing culvert on the tributary stream in the SW¼ SE¼ of Section 1 was installed in 1965. This culvert does not meet current design criteria for slope, width or roughness. High internal velocities and a perched outlet restrict passage of fish and other aquatic organisms.

Stream substrate in Martin Creek is dominated by cobble and boulder sized material. Bedrock is exposed along several reaches due to high stream velocities. Although gravel and smaller material is available as transported bed load, there are few natural structures in place that create the conditions necessary to retain it. Stream banks are well vegetated or armored by rock, and bank erosion is minimal.

II. Terrestrial Wildlife

A. Special Status Species

Special status species include species listed as threatened or endangered under the Endangered Species Act of 1973, as amended; candidate or proposed species for listing under the Act; or designated as Bureau Sensitive or Bureau Assessment species under the Oregon/Washington BLM Manual 6840 policy.

1. Threatened or Endangered Species

The following species inhabit lands managed by the Roseburg District: the Federally-endangered Columbian white-tailed deer (*Odocoileus virginianus leucurus*), the Federally-threatened bald eagle (*Haliaeetus leucocephalus*), the Federally-threatened northern spotted owl *(Strix occidentalis caurina*), and the Federally-threatened marbled murrelet (*Brachyramphus marmoratus*).

Columbian white-tailed deer

The Martin Creek area is outside the currently known population range of Columbian white-tailed deer. No impacts to the species would be expected and no further discussion of the species is necessary in this analysis.

Bald eagle

Bald eagles utilize large trees with large limbs and crown deformities as platforms for nest construction. Nest trees are generally located within ¼ to ¾ of a mile of large bodies of water, such as lakes or river systems. Bald eagles are known to nest along the Umpqua River, northwest of Roseburg (Witt 1985).

Bald eagles are known to roost and hunt along Cow Creek and the South Umpqua River during the winter months. Data from yearly inventories (1971-2002) by Isaacs and Anthony (2002) of known bald eagle nest sites in Douglas County do not indicate any nests or territories in the Martin Creek project area.

Northern spotted owl

Suitable nesting, foraging, and roosting habitat is generally characterized by stands with snags and large conifers with large diameter broken and unbroken limbs, crown deformities, broken tops or cavities which provide nesting sites (Forsman et al. 1984; Hershey 1995; Forsman and Giese 1997).

Forest stands along Martin Creek contain habitat suited for spotted owl nesting. The proposed project area is overlapped by two spotted owl home ranges, but both site centers are more than ¼-mile distant.

Martin Creek is located within the designated critical habitat unit OR-CHU-62, which was established as a link between the Klamath and Coastal provinces, to provide for dispersal and recovery of the spotted owl.

Marbled Murrelet

The proposed project area is located just within the eastern edge the 35-50 mile marbled murrelet management zone. In general terms, nesting habitat is similar to that used by spotted owls. Specific habitat components that provide suitable nesting opportunities differ in many regards, however. The murrelet utilizes trees that possess large limbs, crown deformities, mistletoe brooms and abandoned animal nests for nesting platforms (Mack et al. 2003) rather than utilizing snags and cavities.

LSRs in the Martin Creek area would provide suitable nesting habitat. There have been no surveys to date, so the actual presence or absence of murrelets is unknown. Previous surveys in the South River Resource Area have detected murrelets in the Berry Creek drainage in 1999 (16 miles north-northwest) and the easternmost end of the East Fork Coquille watershed in 2001 (24 miles north-northwest). Murrelet occupancy in the Middle Fork Coquille watershed was confirmed in 2002 (15 miles northwest).

2. Proposed or Candidate Species

There are no terrestrial species documented on the Roseburg District currently proposed for listing, or designated as candidates for listing under the Endangered Species Act of 1973 as amended.

3. Bureau Sensitive Species

Northern goshawk
The Martin Creek area is within the geographic range of the northern goshawk. Goshawks have been noted to utilize many different forest types for hunting. Older forest stands, like those present along Martin Creek, are typical of the type of habitat in which goshawks nest (Marshall 1996).

Townsend's big-eared bat
This bat species is known to use natural cavities (e.g. caves, old-growth trees) and man-made cavities (e.g. mine shafts, adits, bridge structures, house structures) for roosting, raising their young, or over wintering (in Pierson et al. 1999; Fellers and Pierson 2002). There are no caves in the project area but the LSR stands can provide roost areas in tree hollows and foraging habitat in the riparian area. Townsend's big-eared bats are documented in the South River Resource Area and have been observed within 4 miles of the project area (biologist's personal observation).

B. Special Attention Species

Special Attention species are species designated for protection under Survey and Manage and/or Protection Buffer standards and guidelines of the Northwest Forest Plan as amended by the *Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl.* These standards and guidelines have been incorporated into management direction in the ROD/RMP. Special Attention species are not considered special status species unless they have also been designated as such under Oregon/Washington BLM Manual 6840 policy.

In the event that habitat disturbing activities are planned, surveys must be conducted and management recommendations implemented to protect any populations that are located. This management direction is applicable to Federal lands managed by the BLM, but does not apply to private lands that may constitute portions of a project area.

Protection of the Oregon shoulderband snail (*Helminthoglypta hertleini*) is no longer required under Survey and Manage standards and guidelines. A new species, Chace sideband snail (*Monadenia chaceana*), has been added as a Category A species. This snail inhabits the same type of habitat as the shoulderband snail. Pre-disturbance surveys for the species are required. Absent action, there would be no effect on this snail. In the event a decision is made to implement the proposed action, surveys would be conducted where suitable habitat is present. If populations of the snail are found, those sites would be protected by implementation of the most current management recommendations. This would protect habitat conditions considered essential for species persistence. As a consequence, there would be no effects and there is no need to discuss the snail any further in this analysis.

III. Fish and Essential Fish Habitat

A. Aquatic Habitat Conditions

Due to its location in the Middle Creek subwatershed and its proximity to the Formosa Mine site, Martin Creek serves as an important refuge for salmonids from high summer temperatures, acid mine drainage, and heavy metal contamination (USDI, BLM 2000).

Aquatic habitat quality is limited by a lack of large woody debris (volume and number of key pieces), few pool habitat components, and a high percentage of fine sediment in riffle units (ODFW 1993). Surveyed reaches of Martin Creek had an average of 7.5 percent fines and 27 percent gravel in riffle units, 6 percent pool habitat, and less than 3 pieces of LWD comprising 6.6 m^3 of wood per 100 meters. Each of these habitat components received a rating of either *fair* or *poor*.

The culvert on the Martin Creek tributary has high water velocity and an outlet jump which combine to prevent upstream passage of both juveniles and adults. Surveys conducted by BLM biologists in 1996 failed to detect anadromous fish upstream of this culvert.

B. Special Status Species

Electrofishing surveys conducted by ODFW in 1993 found coho salmon (*Oncorhynchus kisutch*), steelhead trout (*O. mykiss*), and cutthroat trout (*O. clarki clarki*) in Martin Creek throughout the reach proposed for improvement.

Coho salmon

The Oregon Coast (OC) coho salmon Evolutionary Significant Unit (ESU) is listed as a Federally-threatened species by the National Oceanic and Atmospheric Administration (NOAA) Fisheries (Federal Register 1998a, Vol. 63, No. 153) with Critical Habitat for OC coho designated as all accessible reaches of aquatic habitat within the range of the ESU (Federal Register 2000a, Vol. 65, No. 32). On March 11, 2002, NOAA Fisheries rescinded the critical habitat designation for 19 salmon and steelhead ESUs, including OC coho (USDC 2002b).

Steelhead trout

Oregon Coast steelhead is considered a Federal candidate for listing by NOAA Fisheries, as a threatened species, due to concern over the future status of the ESU (Federal Register 1998b, Vol. 63, No. 53).

Cutthroat Trout

Jurisdiction for Coastal cutthroat was transferred from NOAA Fisheries to the U.S. Fish and Wildlife Service (FWS) on April 21, 2000 (Federal Register 2000c, Vol. 65, No. 78). Coastal cutthroat trout (*O. clarki clarki*) is under status review by the FWS and is considered a Federal candidate species.

Bureau Sensitive

Other species of concern are the Pacific lamprey (*Lampetra tridentate*) and Umpqua chub (*Oregonichthys kalawatseti*), which are both listed as Bureau Sensitive. Pacific Lamprey and Umpqua chub are also considered sensitive-vulnerable species by the State of Oregon. Both species are known to occur in the Umpqua River Basin, but specific distribution with regard to Martin Creek is presently unknown.

C. Essential Fish Habitat

The Magnuson-Stevens Fishery Conservation and Management Act (MSA), in accordance with the Sustainable Fisheries Act of 1996 (Public Law 104-267) designated Essential Fish Habitat (EFH) for coho salmon (Federal Register 2002, Vol. 67, No. 12). Essential Fish Habitat for coho salmon occurs in the Cow Creek watershed and its tributaries, including Martin Creek through the reach proposed for improvement.

IV. Cultural Resources

A review of historic records identified the presence of a prehistoric site, 35DO106, in Section 1 of T. 32 S., R. 7 W. Two other prehistoric sites, characterized as stream-side lithic scatters, are located in proximity, but not within, the proposed project area. A field inventory was conducted on the east side of Martin Creek and a portion of the west side of Martin Creek with negative results. The remainder of the west side will be surveyed when the specific locations for access and proposed structures are determined.

The known prehistoric site would be protected from disturbance. Any additional discoveries would be similarly protected. As a consequence, no impacts to cultural or historical resources are anticipated and no further discussion is necessary in this analysis.

V. Botanical Resources

The proposed project is within the geographic range of Kincaid's lupine (*Lupinus sulphureus* var. *kincaidii*), a Federally-threatened plant species (Federal Register 2000b, Vol. 65, No. 16). Portions of the Martin Creek drainage contain soils that the U. S. Fish and Wildlife Service has identified as representative of suitable habitat.

Other special status vascular plants with the potential to exist in the area include:

Aster vialis	*Bensoniella oregona*	*Cimicifuga elata*
Cypripedium fasciculatum	*Cypripedium montanum*	

Special Attention species that may be present consist of 5 species of lichens (*Bryoria tortuosa, Hypogymnia duplicate, Lobaria linita, Pseudocyphellaria rainierensis* and *Ramalina thrausta*) and 2 bryophytes (*Schistostega pennata, Tetraphis geniculata*).

Surveys for these species would be conducted. If populations of any of these species are located, management recommendations would be implemented to protect habitat conditions such that there would be no effects, or concerns for persistence. As a consequence, no further discussion of botanical resources is necessary in this analysis.

VI. Noxious Weeds

Implementation of the *Integrated Weed Control Plan* (USDI, BLM 1995a) by the District is ongoing in an effort to prevent or reduce rates of spread of weed populations, and eradication of target species in areas in which management activities are planned. These efforts may include mechanical treatments such as mowing, hand-pulling, and applying herbicides.

Management practices aimed at reducing the potential for spread or establishing conditions favorable for weed germination have also been implemented. These would include required steam cleaning or pressure washing of heavy equipment used in the proposed action, seeding and mulching of exposed soil with native seed, and revegetating disturbed areas with indigenous plant species.

Additional measures that could be employed include the eradication of noxious weeds on a site prior to project implementation, and the scheduling of projects so that work is conducted in uninfested areas prior to initiating work in infested areas. As a consequence, negligible changes in noxious weed populations are anticipated regardless of the alternative selected, and no further discussion of noxious weeds is necessary in this analysis.

Chapter 4
ENVIRONMENTAL CONSEQUENCES

I. Alternative One – Proposed Action

A. Water Quality/Resources

Stream Flow

Judging by its position in the watershed and current riparian condition, lower reaches of Martin Creek appear to have been historically dependent on large wood to help reduce stream energy, retain substrate and organic material, aggrade the stream channel, and maintain a functioning floodplain. The establishment and measurement of stream cross sections could be used to determine the rate of aggradation adjacent to structures.

The proposed instream structures would increase bed elevation by aggrading the stream channel. This would increase the elevation of the local water table, allowing water storage during periods of high flow and potentially increasing summer flows as a consequence of an enlarged floodplain. Stream flows and water temperatures during subsequent low water periods would be buffered by the water stored in the floodplain. However, any increase in summer base flow would not likely be measurable.

Stream Temperature

Shade would not be reduced by a measurable extent, and potential changes to stream temperature in Martin Creek would be negligible.

No trees would be felled and removed from privately-owned lands along Martin Creek, so present levels of shading would be maintained in these areas.

The portion of the proposed project corridor situated on BLM-administered lands is approximately 1½-miles long. Based on a two site-potential tree height, riparian width is 320 feet on either side of the stream. This translates to a project area of approximately 116 acres in size. The removal of trees would reduce stand density by fewer than 2 trees per acre, or even less depending on the number of trees obtained from upland areas.

No trees would be felled within 40 feet of the stream bank and many of the trees would come from areas where the aspect would preclude any solar heating of Martin Creek. Trees felled would come primarily from the intermediate canopy layer, leaving dominant trees intact to provide shade. Increases in heating due to inadvertent loss of shade would be offset by the reservoir of cool water provided by an expanded floodplain and higher water table.

As the channel aggrades, a larger portion of the summer flow would fill spaces between accumulated gravels, subjecting less water surface to solar heating. Recent data collected by S.L. Johnson and the Forest Service Pacific Northwest Research Station suggests that reaches with accumulated gravels are less prone to stream heating than bedrock reaches (L. Standley, BLM, personal communication).

Sediment

Areas used for access would be subject to some soil disturbance which could create a short term potential for sediment. The risk would be reduced by the limited number of access points and use of erosion controls such as water bars, seeding and mulching of exposed soil. Access points would also be blocked to prevent further vehicular use.

Instream work would be restricted to the period from July 1 to September 15, when stream flows are at the lowest levels, and limited to the degree practical to minimize stream bed disturbance. Anticipated effects from sediment created during this work would be localized and not expected to persist beyond the first winter and spring following project completion. In the long term, overall reductions in sediment would be expected as structures capture sediment and retain substrate in the active stream channel.

Culvert replacement would create sediment in association with instream work, but would be anticipated to be short-term and localized in nature. Measures implemented to reduce sediment potential would include: restriction on instream work to the period from July 1 to September 15, limitations on instream equipment operation, pumping or diverting stream flow around the project area, armoring the upstream and downstream approaches with non-erosive material, and revegetating exposed soil.

Replacing the existing culvert with an open-arch pipe installed at or below stream bed elevation, sized to at least bank-full width, and designed for a 100-year flood event would reduce in-pipe flow velocity. This would allow the accumulation of bedload and reduce the potential for channel downcutting and bank erosion.

Channel Condition and Large Wood

The placement of in-stream structures would help reduce stream energy and velocity. This would allow the channel to aggrade, reconnect the channel to a larger floodplain area, and provide habitat for fish and other aquatic organisms. The channel would aggrade as the result of direct physical capture of bedload materials by large wood and associated debris and by capturing sediment including bedload in the lower velocity areas created. A larger floodplain would help reduce stream velocity and, therefore, erosion of stream beds and banks. Substrate and organic material would be retained in the channel longer as opposed to being rapidly flushed downstream.

B. Terrestrial Wildlife

1. Effects to Wildlife

Bald eagle

Given the distance to Cow Creek (≥ 4 miles) and the South Umpqua River (≥ 12 miles), and the lack of documentation of eagles in Martin Creek, it is unlikely that forest stands in the project area are used for nesting. Tree selection would avoid dominant overstory trees, so the suitability of the area for nesting would remain largely unaffected. Trees selected would be characteristic of roosting habitat, but overall stand conditions would remain largely unchanged and the area would still provide roosting habitat.

Northern spotted owl

Under this alternative there would be short-term consequences to the northern spotted owl. Tree removal would modify forest conditions, but the utility of the habitat for nesting, roosting and foraging would remain generally unchanged.

Trees selected for felling would not include those containing critical nesting components such as cavities, large diameter broken and unbroken limbs, deformities, and large broken tops or cavities which provide nesting sites.

The proposed action would modify designated critical habitat through the dispersed removal of trees. This would not impair the intended function of CHU-OR-62, however. Trees with nesting characteristics would be avoided. There would only be low levels of modification to 116 acres, removal of fewer than 2 trees per acre on average, out of approximately 26,200 acres of suitable habitat. This would not prevent use of the area for roosting, foraging and dispersal.

There is a potential for disturbance from tree felling if owls are nesting within ¼-mile of the project area. At this time, the two documented site centers are well beyond ¼-mile of the project area. In the event either owl pair moves within this distance, seasonal operational restrictions would be employed to reduce the potential of disturbance and possible nest abandonment. Project work would be prohibited between March 1 and June 30. As these dates precede the period during which instream work is authorized, no problems would be anticipated.

Marbled Murrelet

This alternative would have the potential to affect murrelets by removing potential nest trees and/or removing nesting structure from adjoining trees. Trees up to 30 inches DBH, with structures providing nesting platforms could be felled. The felling of trees could also result in collateral damage to the canopies of other trees by breaking out limbs and tops. This could result in the loss of additional nesting structure, and remove cover from weather and predation.

Surveys would be conducted according to current protocols (Mack et al. 2003) to determine murrelet use or occupancy of stands in the project area. To minimize the potential for disturbance, if nesting birds are present, operations restrictions would be required. These would consist of a prohibition on operations from 2 hours before sunset until 2 hours after sunrise, from April 1 until August 5.

The Northern Goshawk

Tree felling and collateral canopy damage would modify habitat, but would not alter any patterns of use by goshawks. If goshawks are nesting in the proposed project area, the potential for disturbance would exist in association with tree felling, equipment noise and human activity.

Townsend's big-eared bat
Tree removal would potentially remove roosting habitat, but potential loss of high quality roost sites would be reduced by selecting trees that do not exhibit characteristics known to be important for roosting. In addition, snags and trees with cavities and/or hollows would be avoided.

2. Effects Determination for Threatened or Endangered Species

Bald eagle
Tree removal would include suitable roosting trees and would be considered as a "may affect, not likely to adversely affect" action. While some suitable roosting trees may be lost, habitat would be largely unchanged and would still provide nesting and roosting opportunities.

Additionally, the probability that bald eagles would be nesting in the Martin Creek vicinity is low given the distance to larger river systems. Avoidance of suitable nest trees in the selection of trees to be felled would leave nesting habitat largely unaltered.

Northern Spotted Owl
The removal of approximately 150 trees from stands along Martin Creek would be considered a "may affect, not likely to adversely affect" action because the trees would be selected so as to avoid those with suitable nesting structure and characteristics. The removal of these trees from an area of 116 acres or more would not preclude use of the area for nesting, roosting, and foraging.

Because known spotted owl sites are more than ¼-mile distant from the project area, the project would be considered "no effect" for disturbance.

In the context of OR-CHU-62, the removal of these trees would have a "negligible level" of impact. Tree felling and associated modification of adjacent forest would not change the ability of the CHU to provide nesting, roosting and foraging habitat and dispersal habitat. The modification of current conditions would not alter the current distribution of spotted owls, either.

Marbled Murrelet
The removal of trees providing potential nesting habitat, damage to adjoining crown structure providing potential nesting opportunities, and the loss of cover from the weather and predation were determined as "may affect, likely to adversely affect" marbled murrelets.

With the implementation of daily operational restrictions, previously described, the potential for disturbance on additional habitat was determined as "not likely to affect" marbled murrelets.

C. Fish and Essential Fish Habitat

1. Aquatic Habitat Conditions

Adding structures to Martin Creek would benefit aquatic species and habitat in a number of ways.

Instream Habitat

Debris accumulation above instream debris frequently creates low gradient gravel depositional areas by allowing smaller, sorted substrate to accumulate (Swanston 1991). Spawning beds free from fine sediment and organics allow better exchange of water and oxygen and better temperature regulation resulting in high survival rates for eggs and embryos (Bjornn and Reiser 1991). The proposed structures would reduce stream velocity, allowing for the deposition and storage of sediment and substrate.

The addition of roughness elements such as boulders and large woody debris creates complex fish habitat by forming deep pools, spawning beds, and off channel rearing habitat (Swanston 1991). Scour below and adjacent to structures would create deep water rearing habitat for juveniles and resting pools for adult fish migrating upstream. Deep water rearing habitat would benefit juvenile fish by reducing maximum water temperatures, providing overhead cover from predators, and providing resting areas during high flows.

The success of the structures in improving habitat could be determined using electro-fishing surveys and evaluating increases in fish numbers.

Riparian Conditions

Over time, sediment deposition and storage would aggrade the streambed, allowing a reconnection of the stream to its historic floodplain during periods of high flows. This would aid in the creation of off-channel rearing habitat, recruitment of LWD from the floodplain, and the addition of organic nutrients from the forest floor. Increases in off-channel rearing habitat have been shown to increase salmonid productivity (Nickelson et al. 1992).

Suspended Sediment

There would be moderate short-term increases in suspended sediment resulting from excavator work in and around the stream. Removal and replacement of fill material and construction of a temporary bypass road in association with the replacement of the stream-crossing culvert would also result in localized and short-term effects from sediment. These effects would not be expected to persist beyond the first spring following project activities, as autumn and winter rains would flush the stream system by the following summer.

Habitat Access

Installation of a pipe-arch culvert would remove the current impediments to passage by fish and other aquatic organisms, restoring access to an estimated mile of coho and steelhead rearing and spawning habitat. The success of reestablishment of access for fish would be assessed by the presence or absence of juvenile coho salmon and steelhead trout upstream of the culvert.

2. Effects Determination for Threatened or Endangered Species

Suspended sediment can result in direct or indirect morality by impairing foraging, growth, and respiration (Waters 1995). Fine sediment in the stream can also accumulate in pools, decreasing available rearing habitat, and can fill in gravel beds reducing the quality of spawning habitat (Waters 1995). Increases in suspended sediment would likely occur in the fall as flow increases and begin to mobilize fine sediment. Juvenile and adult coho are expected to be present in the stream during the elevated levels of suspended sediment. Sediment increases may affect fish and fish habitat for up to two miles downstream to the mouth of Martin Creek for up to a year following project implementation.

As a consequence, the proposed alternative would be considered a "may affect, likely to adversely affect" determination for OC coho salmon. These activities are consistent with those described in the *Programmatic Biological and Conference Opinion for Programmatic Activities Affecting SONC Coho Salmon, OC Coho Salmon, and OC Steelhead* (USDC, October 18, 2002a) and would not require additional formal consultation with NOAA Fisheries.

3. Effects Determination for Essential Fish Habitat

The effects of the proposed action on Essential Fish Habitat would be as a consequence of temporary and localized sediment in Martin Creek. This sediment could result in short-term degradation of spawning substrates and was determined as an "adverse effect." This is also consistent with the *Programmatic Biological and Conference Opinion for Programmatic Activities Affecting SONC Coho Salmon, OC Coho Salmon, and OC Steelhead* (USDC, October 18, 2002).

II. Alternative Two – No Action

A. Water Quality/Resources

This alternative would have no effect on current stream flows and temperature. Summer flows would remain low, and conditions prompting the recommendation to list Martin Creek as impaired for excess water temperature would remain.

There would be no temporary change in sediment levels associated with instream work and culvert replacement. There would be no long-term reduction in sediment provided by added structures.

Large flow events would continue to scour the stream channel and transport substrates and organic material out of the stream system until the natural recruitment of large wood is sufficient to reduce stream velocity and energy, and allow bedload retention.

B. Terrestrial Wildlife

There would be no direct consequences to any wildlife species as stand conditions would remain unaltered until some future date when natural disturbances or resource management modifies these conditions.

C. Fish and Essential Fish Habitat

In the absence of action, current deficits in amounts of large woody debris would persist in Martin Creek. Present conditions would only provide moderate amounts of habitat for spawning and rearing of salmonids. The stream channel would continue to incise in areas where bedrock is not currently the dominant substrate, further reducing available spawning habitat and floodplain access. Stream energy and velocity would remain high during periods of high flows, increasing scour rates.

The culvert beneath Road No. 32-7-1.2 would not be replaced and would continue to block access to an estimated mile of historical spawning and rearing habitat for coho salmon and steelhead trout.

III. Recent and Reasonably Foreseeable Future Federal Actions and Other Events in the Lower Cow Creek Watershed Having Potential Cumulative Effects

One commercial thinning and two regeneration harvests are planned for implementation within the next 5 years, with the commercial thinning and one regeneration harvest expected to be offered in fiscal year 2003. Boomerang Commercial Thinning would modify dispersal habitat for the northern spotted owl by thinning approximately 160 acres of 40-45 year-old stands. In association with the thinning, approximately 0.50 miles of temporary construction and the renovation of 0.70 miles of unsurfaced roads are planned, with decommissioning upon the completion of thinning operations. There would be renovation of an additional 0.40 miles of unsurfaced road, to include aggregate surfacing, construction of 0.10 miles of permanent road.

The Cow Catcher and Loose Laces timber sales would harvest approximately 345 acres of mature timber that provides suitable habitat for the northern spotted owl. The two actions propose no permanent road construction. Temporary and semi-permanent construction is estimated at 1.63 miles. In addition to the main haul roads, another 0.70 miles of permanent road, and 0.55 miles of unsurfaced roads are proposed for renovation. Following the completion of the sales, approximately 2.3 miles of road would be decommissioned subject to agreement by parties holding reciprocal rights.

Overall road construction associated with proposed timber harvest would be largely offset by decommissioning, such that there would be negligible changes in road density. Road renovation would be largely targeted at upgrading road surfacing and replacing and/or augmenting road

drainage systems. The long-term consequences would be overall reductions in fine sediments associated with the transportation system.

Large stream-crossing culverts were replaced on Union Creek and Live Oak Creek in the summer of 2002. Effects of these projects on aquatic habitat were derived from sediment, but these are anticipated to pass by the summer of 2003. Other restoration work planned in the watershed is limited to the planned replacement of a large stream crossing on Russel Creek, in the summer of 2003.

Acid mine drainage from the old Formosa mine is expected to continue to deposit high concentrations of heavy metal precipitate in Middle Creek for the foreseeable future.

IV. Monitoring

Monitoring would be done in accordance with the ROD/RMP (p. 84) and implementation monitoring described in Appendix I (pp. 191 & 191-195). Emphasis would be placed on assessing the effects of the restoration activities on the following: Late-Successional Reserves; Water and Soils; Wildlife Habitat; Fish Habitat; and Special Status and SEIS Special Attention Species Habitat.

Chapter 5
AGENCIES AND INDIVIDUALS CONTACTED; PREPARERS; LITERATURE AND REFERENCES CITED

I. Agencies and Individuals Contacted

Cow Creek Band of Umpqua Indian Tribes
Oregon Department of Fish and Wildlife
Roseburg Resources Company
U. S. Fish and Wildlife Service

II. Preparers

Paul Ausbeck	NEPA Coordination and Review
Gary Basham	Botany
Roli Espinosa	Wildlife
Joe Ross	Management Representative
Cory Sipher	Writer/Editor/Fisheries
Don Scheleen	Cultural Resources
Larry Standley	Hydrology

III. Agencies, Organizations, and Individuals to be notified of availability of the EA and "Draft" FONSI

Douglas Timber Operators, Robert Ragon Executive Director
NOAA Fisheries
Oregon Department of Environmental Quality
Oregon Department of Fish and Wildlife
Oregon Natural Resources Council
Umpqua Basin Watershed Council
Umpqua Watersheds, Inc.
U. S. Fish and Wildlife Service
Ronald Yockim, Attorney-at-Law

Literature and References Cited:

Bjornn, T. C. and D. W. Reiser. 1991. Habitat Requirements of Salmonids in Streams. American Fisheries Society Special Publication 19:83-138.

Federal Register. 1998a. Endangered and Threatened Species; Endangered Status for Oregon Coast Evolutionarily Significant Unit of Coho Salmon. Federal Register 63(153):42587-42591.

Federal Register. 1998b. Endangered and Threatened Species; Threatened Status for Two ESUs of Steelhead in Washington, Oregon, and California. Federal Register 63(53):13347-13371.

Federal Register. 2000a. Designated Critical Habitat: Critical Habitat for 19 Evolutionarily Significant Units of Salmon and Steelhead in Washington, Oregon, Idaho, and California. Federal Register 65(32):7764-7787.

Federal Register. 2000b. Endangered and Threatened Wildlife and Plants; Endangered Status for ``*Erigeron decumbens*'' var. ``*decumbens*'' (Willamette Daisy) and Fender's Blue Butterfly (``*Icaricia icarioides fenderi*'') and Threatened Status for ``*Lupinus* sulphureus" ssp. ``*kincaidii*'' (Kincaid's Lupine). Federal Register 65(16): 3875-3890.

Federal Register. 2000c. Endangered and Threatened Wildlife and Plants; Notice of Change of Jurisdiction for Coastal Cutthroat Trout. Federal Register 65(78):21376-21377.

Federal Register. 2002. Magnuson-Stevens Act Provisions; Essential Fish Habitat. Federal Register, 67(12):2343-2383.

Fellers, Gary M. and Elizabeth D. Pierson. 2002. Habitat Use and Foraging Behavior of Townsend's Big-eared Bat (*Corynorhinus townsendii*) in Coastal California. Journal of Mammalogy. 83(1): 167-177

Forsman, E. D., E. C. Meslow and H.W. Wight. 1984. Distribution and biology of the spotted owl in Oregon. Wildlife Monographs. No. 87. April 1984. A Publication of the Wildlife Society. 64 pp.

Forsman, E.D. and A.R. Giese. 1997. Nests of northern spotted owls on the Olympic Peninsula, Washington. Wilson Bulletin 109(1):28-41.

Foster, S.C., C.H. Stein, and K.K. Jones. 2001. A guide to interpreting stream survey reports. *Edited by* P.A. Bowers. Information Reports 2001-06. Oregon Department of Fish and Wildlife, Portland.

Hershey, K. 1995. Characteristics of forests at spotted owl nest sites in the Pacific Northwest. 85 pp. Masters Thesis. Oregon State University, Corvalis, Oregon.

Isaacs, F., and B. Anthony. 2002. Bald eagle nest locations and history of use in Oregon and the Washington portion of the Columbia River Recovery Zone, 1971 through 2002. Oregon Cooperative Fish and Wildlife Research Unit, Oregon State University, Corvallis. 21 pp, 6 tables, 3 figures, 1 appendix. 34 pp.

Keim, R.F., A.E. Skaugset and D.S. Bateman. 2000. Dynamics of Coarse Woody Debris Placed in Three Oregon Streams. Forest Science 46(1), pp 13-22.

Kuck, Todd D. 2000. Regional Hydraulic Geometry Curves of the South Umpqua Area in Southwestern Oregon. Stream Notes, January 2000, Stream Systems Technology Center, USDA Forest Service, Rocky Mountain Research Station. Fort Collins, Colorado.

Mack, D. M., W. P. Ritchie, S. K. Nelson, E. Kuo-Harrison, P. Harrison, and T. E. Hammer. 2003. Methods for surveying marbled murrelets in forests: An update to the protocol for land management and research. Pacific Seabird Group, Marbled Murrelet Technical Committee. April 15, 2000.

Marshall, D. B. 1996. Sensitive, threatened, and endangered vertebrates of Oregon. Oregon Department of Fish and Wildlife, Portland, Oregon.

Nickelson, T. E. , M. F. Solazzi, S. L. Johnson, and J. D. Rodgers. 1992. Effectiveness of selected stream improvement techniques to create suitable summer and winter rearing habitat for juvenile coho salmon (*Oncorhynchus kisutch*) in Oregon coastal streams. Canadian Journal of Fisheries and Aquatic Sciences 49:790-794

Oregon Department of Environmental Quality. 1998. Final 1998 303(d) Database, Record ID 5764.

Oregon Department of Fish and Wildlife (ODFW). 1993. Umpqua Basin Aquatic Habitat Surveys, Cow Creek Sub-Basin, Vol. 1.

ODFW. 1997. Oregon Guidelines for Timing of In-Water Work to Protect Fish and Wildlife Resources.

Pierson, E. D., M. C. Wackenhut, J. S. Altenbach, P. Bradley, P. Call, D. L. Genter, C. E. Harris, B. L. Keller, B. Lengus, L. Lewis, B. Luce, K. W. Navo, J. M. Perkings, S. Smith, and L. Welch. 1999. Species conservation assessment and strategy for Townsend′s big-eared bat (*Corynorhinus townsendii townsendii* and *Corynorhinus townsendii pallescens*). Idaho Conservation Effort, Idaho Department of Fish and Game, Boise, Idaho. 63 pp.

Swanston, D. N. 1991. Natural Processes. American Fisheries Society Special Publication 19:139-179.

U.S. Department of Agriculture (USDA), Forest Service and USDI, BLM. 1994a. 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.

USDA, Forest Service and USDI, BLM. 1994b. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl. Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl.

USDA, Forest Service and USDI, BLM. 1998. South Coast - Northern Klamath Late - Successional Reserve Assessment.

USDA, Forest Service and USDI, BLM. 2001. Record of Decision for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines in Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl.

U.S. Department of Commerce (USDC), National Oceanic and Atmospheric Administration (NOAA), Fisheries. October 18, 2002a. Programmatic Biological and Conference Opinion for Programmatic Activities Affecting SONC Coho Salmon, OC Coho Salmon, and OC Steelhead. Seattle, Washington.

USDC. Press Release: NOAA R02-111. March 11, 2002b.

U.S. Department of the Interior (USDI), Bureau of Land Management (BLM). 1994. Roseburg District Proposed Resource Management Plan/Environmental Impact Statement.

USDI, BLM. 1995a. Roseburg District Integrated Weed Control Plan and Environmental Assessment. Roseburg, Oregon.

USDI, BLM. 1995b. Roseburg District Record of Decision and Resource Management Plan. Roseburg, Oregon.

USDI, BLM. 2000. Formosa Abandoned Mine Land Site Remedial Investigation. South River Field Office, Roseburg, Oregon.

USDI, BLM. 2002. Lower Cow Creek Watershed Analysis and Water Quality Restoration Plan. South River Field Office, Roseburg District, Roseburg, Oregon.

Waters, T. F. 1995. Sediment in Streams, Sources, Biological Effects and Control. American Fisheries Society Monograph 7.

Witt, J. 1985. Umpqua River Corridor Habitat Management Plan OR-100-T-01. Drain Resource Area, Roseburg District Bureau of Land Management.

APPENDIX A
CRITICAL ELEMENTS OF THE HUMAN ENVIRONMENT

The following elements of the human environment are subject to requirements specified in statute, regulation, or executive order. These resources or values are either **not present** or **would not be affected by the proposed actions or alternative**, unless otherwise described in this EA.

ELEMENT	NOT PRESENT	NOT AFFECTED	IN TEXT
Air Quality		X	
Areas of Critical Environmental Concern	X		
Cultural Resources		X	X
Environmental Justice		X	
Farm Lands (prime or unique)	X		
Floodplains	X		
Invasive, Non-native Species		X	X
Native American Religious Concerns	X		
Threatened or Endangered Wildlife Species			X
Threatened or Endangered Plant Species		X	X
Wastes, Hazardous or Solid	X		
Water Quality Drinking/Ground		X	X
Wetlands/Riparian Zones			X
Wild & Scenic Rivers	X		
Wilderness	X		
Visual Resource Management		X	